

Western Rail Link to Heathrow (WRLtH)

Environmental Impact Assessment:
Preliminary Environmental Information Report

Non Technical Summary

March 2018



The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

The Network Rail (Western Rail Link to Heathrow) Order

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NON TECHNICAL SUMMARY

1.1 Introduction

1.1.1 Heathrow Airport is the UK's busiest airport with 75.7 million passengers annually (Heathrow Airport Limited, 2016). The London Underground, Heathrow Connect and Heathrow Express provide excellent connections to central London. However, there are limited options for rail passengers travelling to and from other destinations. The Western Rail Link to Heathrow, the 'Proposed Scheme', would address this by providing a new direct link from Reading. In doing so, it will:

- Improve accessibility to Heathrow Airport from the west, southwest, south Wales and West Midlands;
- Reduce rail journey times between Reading and Heathrow Terminal 5 (T5);
- Provide a greater choice of travel mode;
- Reduce car mileage; and
- Reduce congestion at London Paddington for existing rail passengers.

1.1.2 For large infrastructure projects known as 'Nationally Significant Infrastructure Projects' planning permission can only be granted by applying for a Development Consent Order (DCO). A DCO will be required to allow the Proposed Scheme to be built.

1.1.3 Network Rail intends to make an application for a DCO for the Proposed Scheme. As part of the preparation and process leading to a DCO application it is a legal requirement to publish preliminary environmental information. This is intended to provide an early insight into the potential environmental effects that could be expected as a result of the Proposed Scheme. This would include for example, potential impacts on people and nature.

1.1.4 This preliminary environmental information is not the full detailed Environmental Impact Assessment (EIA) that will be required for the final design of the Proposed Scheme, however, it is part of the process moving towards that.

1.1.5 This preliminary environmental information facilitates consultation with the community and stakeholders. The comments received in response to this will inform the development of the final proposals and the design which will form the basis of the DCO application.

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1.1.6 This Non-Technical Summary provides an overview of the Preliminary Environmental Information Report.

1.2 Need for the Proposed Scheme

1.2.1 The Proposed Scheme would help to meet demand from the airport passengers as well as airport employees and is seen as important in improving access connections to Heathrow Airport and reduce journey times for those travelling from the west. Once the Proposed Scheme is open it would take 26 minutes for the fastest service to get from Reading station and 6/7 minutes from Slough station to Heathrow Airport. This reduction in travel time is intended to help alleviate congestion on critical sections of the M25 by encouraging the people using Heathrow Airport to travel by rail rather than by vehicle.

1.2.2 Table NTS 1.1 shows a comparison of the current generalised journey times to Heathrow Airport and the future reduced generalised journey times resulting from the Proposed Scheme. Generalised journey times account for service frequency and interchanges.

Table NTS1.1: Current and future generalised journey times to Heathrow Airport

Origin	Current generalised journey time to Heathrow	Future generalised journey time to Heathrow
Reading	88 minutes	41 minutes
Slough	79 minutes	29 minutes

1.3 Description of the Proposed Scheme

1.3.1 The Proposed Scheme would consist of a new 6.5km rail link between Langley Station, on the Great Western Main Line (GWML), and Heathrow Airport Terminal 5 as shown on Figure 1.1A.

1.3.2 Trains to Heathrow Airport would use the existing railway lines between Reading and Langley and would then transfer to the new railway line east of Langley. The new lines would be at the surface where they would connect with the GWML, moving south east they would descend in cutting before entering approximately 4km of twin bored tunnels all the way to Heathrow Airport.

1.3.3 There would be two tracks, one for trains going to the airport and one for trains coming from the airport.

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These are referred to as the 'airport lines'. Once in operation, trains would run up to a maximum speed of 75mph.

1.3.4 The main elements of the Proposed Scheme (from north to south) include: -

- Diversion of two existing railway lines onto a new earth embankment and short section of cutting (to the east) between Langley and Iver;
- New floodplain compensation areas north of the GWML;
- A new embankment for the new airport lines between Langley and Hollow Hill Lane;
- A road rail access point at Hollow Hill Lane;
- A Rail Intersection Bridge (RIB) 100m long to allow the Proposed Scheme to pass underneath the GWML;
- A cutting either side of the RIB;
- An access road from Market Lane, south of the GWML to a new a compound and building at the portal to the cut and cover tunnel;
- A 500m cut and cover tunnel connecting the retained cutting and the bored tunnels;

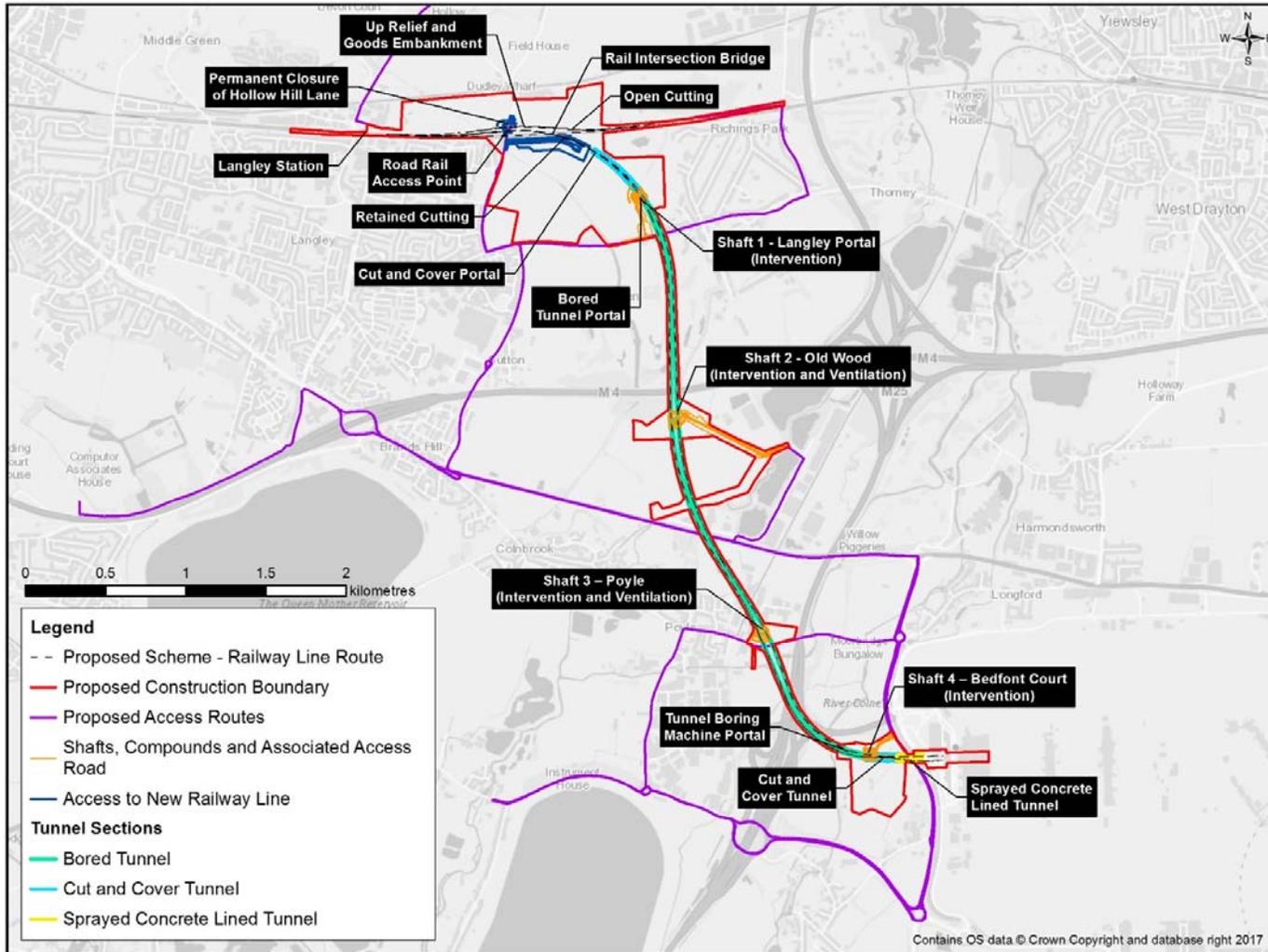
- Two approximately 4km twin-bore rail tunnels between Richings Park and Bedfont Court to the west of Heathrow Terminal 5.
- Four shafts, each with associated head houses, along the length of the bored tunnel one at its northern end, then Old Wood, Poyle and Bedfont Court. These provide safe access and ventilation for the tunnel.
- A 200m cut and cover section of track at Shaft 4 – Bedfont Court; and
- A 150m section of spray concrete lined tunnel to connect the cut and cover section at Bedfont Court into the existing stub tunnels at Heathrow Airport.

1.3.5 The construction works are planned to commence in 2020 for environment works and 2022 for the start of main construction with the Proposed Scheme planned to be operational in 2028.

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Figure 1.1A Proposed Scheme



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1.4 Consideration of alternatives

1.4.1 Network Rail has considered a number of options for the new link to Heathrow Airport. Four route alignments with 10 sub-options have been explored. These included:

- *The Datchet branch*: an option making partial use of the existing Staines to Windsor and Eton Riverside and Windsor and Eton Central to Slough branch lines.
- *West facing Heathrow branch*: an option of a west facing connection from the existing airport spur line to the GWML.
- *The Colnbrook branch (including two sub-options)*: an option making partial use of an existing railway with two tunnelling sub-options, one to the north of the M4 and one to the south of the M4.
- *The Langley branch (including six sub-options)*: an alignment connecting the GWML to the east of Langley station with new tunnels to Heathrow Airport.

1.4.2 The route and length of tunnelling proposed for the Langley branch sub-options reduced the potential environmental risks compared with other options.

1.4.3 The Langley Branch sub-option, referred to as the 'green' option, was selected as the 'Proposed Scheme'. This was due its journey time in combination with the shortest construction time of the options.

1.5 Consultation

1.5.1 A Statement of Community Consultation was produced as part of the DCO process and agreed with the relevant local authorities.

1.5.2 In addition to ongoing engagement with local authorities, landowners and statutory bodies Network Rail has already undertaken two phases of informal consultation on the Proposed Scheme including:

- Consultation in 2015 on the Proposed Scheme; and
- Consultation in 2016 on the Proposed Scheme and an Initial Environmental Information Report.

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1.5.3 Network Rail has produced this Preliminary Environmental Information Report (PEIR) as part of the EIA process, specifically to support consultation on the Proposed Scheme. The PEIR builds on the work that has been completed and consulted upon previously as part of the EIA.

1.5.4 The PEIR provides an account of the environmental information available at the time of writing. The purpose of the PEIR is to inform the public of the likely significant environmental effects arising as a result of the Proposed Scheme.

1.5.5 All comments received will be duly considered in the EIA process, the conclusions of which will be reported in an Environmental Statement submitted with the DCO application.

1.6 Environmental Impact Assessment

1.6.1 The PEIR report details the proposed methodology for an EIA of the 'Proposed Scheme' along with preliminary assessment findings.

1.6.2 An EIA is a process which identifies significant environmental and social effects (both adverse and beneficial) associated with a proposed development prior to achieving consent. This information is used by decision makers to determine whether a

development should proceed. The EIA also inputs to the Proposed Scheme's design, with the aim of reducing adverse impacts through mitigation and promoting beneficial effects.

1.7 Scope of the Environmental Impact Assessment

1.7.1 The process of EIA Scoping was undertaken to determine the scope and methodology to be applied for the environmental assessment of the Proposed Scheme. This was detailed in the EIA Scoping Report and submitted to the Planning Inspectorate in 2015. The Planning Inspectorate issued a Scoping Opinion in June 2015 confirming the bounds of the environmental assessment.

1.7.2 The scoping process concluded that the environmental topics covered below are relevant to the EIA process for the Proposed Scheme, and these have informed the structure and scope of the PEIR.

1.7.3 Further assessment will be completed to inform the EIA. The full results of the EIA process will be presented in the Environmental Statement submitted as part of the DCO application.

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1.8 Environmental baseline

1.8.1 The route of the Proposed Scheme is situated within the valley of the River Colne and its floodplain. Consequently, the landform is reasonably flat and low lying. The Colne Brook forms a distributary of the River Colne which flows between Colnbrook and Poyle and west of the M4/ M25 interchange.

1.8.2 The landscape has been heavily influenced by mineral extraction (evidenced by a pattern of frequent reservoirs and water bodies) and landfill activity. There is limited woodland cover, although linear areas of dense vegetation occur along watercourses and on infrastructure embankments, and small pockets of mixed woodland are scattered across golf courses.

1.8.3 Land-use is generally mixed with larger-scale infrastructure, and industrial and commercial areas often sited adjacent to areas of low settlement density and recreational or agricultural use. Medium and smaller scale residential settlements are closely situated, such as Richings Park, Poyle and Colnbrook.

1.8.4 This is a discordant and fragmented landscape which is heavily influenced by its proximity to Heathrow Airport and Greater London in the east

and to Slough and Langley in the west, by key infrastructure corridors (M25, M4, and GWML) and by the presence of overhead pylons.

1.8.5 The area has a range of public and recreational open spaces including nature reserves (Frays Island and Mabey's Meadow Nature Reserve is a London Wildlife Trust Nature Reserve and is considered a location of regional importance), golf courses, and publicly accessible reservoirs. Recreational use and access is promoted within the Colne Valley Park (although some Public Rights of Way have been severed by infrastructure development), and the 'Colne Valley Trail' is a 14 mile promoted long distance footpath from Rickmansworth in the north following the River Colne southward to Colnbrook.

1.8.6 The Slough Arm of the Grand Union Canal runs to the north of the GWML. The Grand Union Canal Walk long distance path follows the towpath along the canal.

1.9 Measures to avoid environmental effects

1.9.1 Network Rail has developed the Proposed Scheme with mitigation measures that would avoid or reduce potential environmental effects where it is reasonable to do so.

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1.9.2 Proposed mitigation includes: -

- Avoiding or reducing potential environmental effects by changes to the scheme design, this is referred to as ‘embedded mitigation’. The most significant of these measures are detailed in Table NTS1.2;
- Measures to be used to manage potential construction effects, referred to as ‘construction management measures’ which are detailed in the Draft Code of Construction Practice (CoCP); and
- Where effects remain, potential ‘additional mitigation’ measures to reduce the impact of the Proposed Scheme. Examples of these measures are detailed in Table NTS1.3.

1.9.3 This Preliminary Environmental Information Report details the potential for significant environmental effects after the following mitigation measures have been applied.

Table NTS1.2: Examples of embedded mitigation measures

Design element	Environmental benefit (mitigation) assumed as part of the design
Use of bored tunnels	The use of bored tunnels avoids surface impacts. The size of the tunnels reduces the volume of surplus excavated material.
Horizontal alignment	The alignment avoids known contamination from Tanhouse Landfill.
Horizontal alignment	Choice of alignment to reduce the number of properties directly above sections of tunnelling.
Vertical alignment	Raising the vertical alignment at Langley: - <ul style="list-style-type: none"> • Reduced the length of the Proposed Scheme and avoids the need for works affecting Langley station; • Reduced the volume of surplus material to be excavated as depth of cutting reduced; and • Avoided a major diversion of the Horton Brook.
Vertical alignment	The ‘higher’ vertical alignment for the bored tunnels has reduced the potential for groundwater impacts.
Rail sidings	Use of railway to export excavated materials and avoids Heavy Goods Vehicle movements on local roads.

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Table NTS1.3: Examples of proposed additional mitigation measures

Design element	Environmental benefit (mitigation) assumed as part of the design
Landscape planting	Landscape planting to mitigate for the loss of habitats cleared to enable construction. Design of new planting to reconnect habitats fragmented during construction. Provision of planting to screen disturbance from trains.
Floodplain compensation areas	It has been agreed with the Environment Agency that this will be designed to provide compensation for storage lost up to a 1% Annual Exceedance Probability (1 in 100) +35% allowance for climate change
Ecological mitigation areas	Areas of new habitat for species to be moved into and to replace habitat lost as result of the Proposed Scheme.

1.10 Significant effects after mitigation measures have been applied

1.10.1 A preliminary assessment has been undertaken for each environmental topic based on available information. The potential significant effects are summarised in the following paragraphs.

Air quality

1.10.2 The air quality assessment considers the potential effects on human receptors, ecological habitats and vehicle exhaust emissions on roads. The assessment also considers dust.

1.10.3 During construction of the Proposed Scheme the risk of dust emissions and associated ambient particulate matter concentrations (known as PM₁₀), occurs from demolition, earthworks and the movement of vehicles from the site onto the public road network. Both have the potential to result in an adverse effect at sensitive locations. This effect varies depending upon the scale of anticipated works and sensitivity of the surrounding area. Standard good practice measures to mitigate dust emissions from the construction phase of the Proposed Scheme have been included within a Draft Code of Construction Practice (CoCP) to prevent or minimise the release of dust entering the atmosphere and/or being deposited on nearby receptors. With these mitigation measures in place, residual effects on receptors would not be significant.

1.10.4 During construction, emissions generated by construction vehicles have the potential to result in

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elevated ambient NO₂ and PM₁₀ concentrations in close proximity to busy roads. Increased concentrations have the potential to result in a significant adverse effect.

- 1.10.5 During operation of the Proposed Scheme the permanent closure of Hollow Hill Lane and associated redistribution of traffic on the local road network has the potential to increase ambient NO₂ and PM₁₀ concentrations at sensitive human receptor locations (such as residential locations). Potentially significant adverse effects on human health from PM₁₀ may occur should Air Quality Objectives be exceeded. A full assessment is to be carried out as part of the EIA to ascertain these effects.
- 1.10.6 As the Proposed Scheme would improve access via public transport to Heathrow Airport, once the Proposed Scheme is operational air quality benefits may result due to reduced road vehicle journeys between the areas which will be served by the WRLtH and Heathrow Airport. Further air quality assessment is required to confirm significance levels.

Cultural heritage

- 1.10.7 This cultural heritage assessment considers effects on archaeological remains, historic buildings and historic landscapes.
- 1.10.8 In total 184 assets have been identified in the combined 300m inner study area and 1km outer study area.
- 1.10.9 The 'cut-and-cover' excavation east of Langley and the diversion of an existing rail line at Langley would have the potential to remove archaeological remains.
- 1.10.10 In addition, there would be the potential for the Proposed Scheme to remove archaeological remains at Shaft 4 – Bedfont Court.
- 1.10.11 Network Rail would agree to a 'scheme of investigation' with Historic England and the local authorities prior to DCO application. This would help preserve the information on heritage features.
- 1.10.12 The setting of all the Listed Buildings identified within a 1km study area may be temporarily affected by the above ground construction works. In particular, the works would have the potential to have an adverse effect on the aesthetic value of these assets through

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an increase in noise and construction traffic. However, the primary significance of these assets is considered to lie within their historical value which is unlikely to be significantly impacted upon by construction works. Due to the significant distance between the Listed Buildings and the construction works, along with the presence of built up areas causing a lack of visibility and views overall, the impact on the identified Listed Buildings is considered to be negligible.

Ecology

- 1.10.13 The ecology assessment considers the risk of impacts on species, habitats and designated sites during the construction and operation of the Proposed Scheme.
- 1.10.14 The ecological risk associated with the Proposed Scheme includes: habitat loss and fragmentation during construction, in particular loss of slow worm and grass snake habitat and loss of a main and annex badger sett; temporary closure of a subsidiary and outlier sett; and disturbance due to noise, vibration and lighting during construction.
- 1.10.15 Network Rail intends to reduce these impacts by adopting mitigation measures including, in

particular, licensed exclusion of badgers and construction of an artificial main sett, licenced removal of bat roosts in trees, habitat creation for reptiles and translocation of animals to these habitats, and the adoption of best practice construction measures as detailed in the Draft CoCP.

- 1.10.16 The embedded mitigation and construction management measures combined with the proposed additional mitigation measures would offset the impacts and it is predicted that there would be no significant residual effects.

Landscape and visual

- 1.10.17 The landscape and visual assessment considers the potential effect on:
- landscape characteristics (landform, vegetation, land use and watercourses);
 - landscape receptors including elements and features that contribute to landscape character; and
 - visual receptors (residents, public at public facilities and outdoor recreation areas and the users of footpaths, bridleways and roads).

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- 1.10.18 Significant adverse effects may occur during construction. However, most of these effects would be temporary in nature.
- 1.10.19 Immediately north of the GWML, west of Hollow Hill Lane, the Proposed Scheme would result in a long term change to landform and land use due to excavation for the creation of Horton Brook Floodplain Compensation Area, a bund embankment close to the Grand Union Canal and new embankments. These works would also result in a moderate loss of woodland, tree and scrub planting on the existing embankments and loss of hedgerow along the Grand Union Canal Walk that would open up some views from the canal for users of the walk and boat residents.
- 1.10.20 The main effect on landscape character during construction immediately south of the GWML would be related to a construction compound within arable fields, with associated car parking, temporary stockpiles of material and areas for the equipment necessary for construction. This might temporarily affect the openness of land within the Green Belt. It is likely that the construction activity would be particularly prominent from the properties along Market Lane, Parlaunt Road and North Park road and from Mapling Park (the park). The construction activity would also be visible from properties on the western side of Richings Park, St. James Walk, Syke Cluan and Bathurst Walk and St. Andrew's United Reform Church, even though vegetation within the back gardens would soften the view. Footpath IVE/15/1 would be temporarily closed and used as a haul route.
- 1.10.21 During construction there would also be adverse landscape and visual effects at Shaft 2 – Old Wood, and Shaft 4 – Bedfont Court and temporary visual effects at Shaft 3 – Poyle
- 1.10.22 The proposed landscape mitigation in the area immediately north of the GWML would result in a slight improvement of the landscape character on completion of the Proposed Scheme.
- 1.10.23 The change in landform integrated with grassland seeding would be beneficial in the event of flooding in the surrounding areas. The proposal for a range of native planting, such as grassland, woodland, scrub and trees would promote biodiversity. New scrub planting along the Grand Union Canal would enhance the landscape setting of the canal, strengthen green infrastructure and provide additional screening to the GWML. Native planting

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along Horton Brook would enhance its character and improve ecological functionality.

1.10.24 Immediately south of the GWML there would be some residual effects on visual receptors at the northern end of Market Lane. Landscape planting would help to soften views to the new structures. With the proposal of new sections of footpath there would be a moderate beneficial effect on Footpath IVE15/1.

1.10.25 There would be some residual effects on visual amenity for the bridleway east and south of Shaft 2 – Old Wood that would have close range views of the new building. Colne Valley Way running to the south of the shaft would be slightly diverted by the access road to the shaft. Landscape mitigation would partially screen the new building and create a soft boundary to the pastoral field.

1.10.26 Landscape mitigation would reduce the impact on views from the properties south of Bath Road to Shaft 3 – Poyle.

Noise and vibration

1.10.27 The noise and vibration assessment considers potential effects sensitive receptors including health effects, annoyance and sleep disturbance.

1.10.28 The construction and operation of the Proposed Scheme would involve new sources of noise and vibration, and a risk of adverse effects at various receptors in the vicinity of the Proposed Scheme, including Langley Station Area, Richings Park, North Park, Bath Road, Mansion Lane Caravan Site and St. Andrew's United Reformed Church.

1.10.29 During construction, likely significant adverse effects are anticipated, including from:

- Airborne noise resulting from construction activities on the ground (earthworks, piling and shaft construction).
- Groundborne noise and vibration resulting from tunnelling.
- Vibration resulting from vibratory ground compaction.
- Construction road traffic noise and construction rail noise.

1.10.30 Network Rail intends to adopt mitigation measures that would be effective in reducing these effects including 'Best Practicable Means'. These are reported within the Draft Code of Construction Practice which would be adopted throughout construction.

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1.10.31 There is potential for the Proposed Scheme, once operational to result in permanent significant adverse effects on a number of dwellings and other receptors in the vicinity of the Proposed Scheme including from:

- Airborne noise from the ventilation shafts;
- Road traffic noise;
- Operational rail noise (airborne); and
- Operational rail groundborne noise and vibration.

1.10.32 Network Rail shall give consideration to noise control measures aimed at reducing noise impacts at sensitive receptors to avoid significant effects in the final scheme design where possible.

Surface water and flood risk

1.10.33 The surface water and flood risk chapter considers the potential effects on the risk of flooding, water quality and geomorphology of surface waters during the construction and operation of the Proposed Scheme.

1.10.34 The Proposed Scheme would adversely affect flood risk as it would result in the loss of existing floodplain storage and increase the potential for increased

flood risk. Network Rail intends to mitigate this increase in flood risk elsewhere through the inclusion of floodplain compensation (approximately 75,000m³) located adjacent to Horton Brook between the Proposed Scheme and the Grand Union Canal and (approximately 1500m³) close to Bedfont Court and other mitigation measures such as flood walls and drainage runoff attenuation storage.

1.10.35 Without mitigation, the Proposed Scheme is considered to have a significant adverse effect on flood risk. The identified mitigation measures are considered to reduce this impact and result in negligible change to flood risk.

1.10.36 The Proposed Scheme would have an impact on the geomorphology and water quality of the surface water receptors, in particular, on Horton Brook drain.

1.10.37 Significant residual effects remain following the application of additional mitigation because of:

- The extended culvert and realignment of the Horton Brook and the use of two outfalls and cut-off drains at Horton Brook during operation. Potential adverse residual effects, dependent on the extent of in-channel improvements and discussions with the regulators.

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- The new flood wall at Horton Brook during operation. Effects are likely should the length of the new wall required remain unchanged and landscaping of downstream not be sufficient to compensate for lost natural bank and riparian vegetation.
- Runoff from road drainage feeding Horton Brook drain during operation. Adverse effects are dependent on whether appropriate treatment can be achieved. This will be informed by further assessment.

1.10.38 For Horton Brook, additional mitigation is proposed to reduce the significant residual effect. This would be in the form of landscaping and in-channel improvements, which will be further developed and assessed. For the Horton Brook drain, additional mitigation would primarily be formed of appropriate treatment and attenuation of discharges to the watercourse. An assessment will be undertaken for discharges from the road network, with consultation undertaken with the regulatory bodies as required. With additional mitigation it is assumed that residual effects would be reduced. However, this is dependent on final design.

Hydrogeology

- 1.10.39 The hydrogeology assessment considers groundwater levels, groundwater flows in the various aquifers, groundwater quality and surface water features dependent on or connected to groundwater.
- 1.10.40 A key element assessed was the potential for construction groundwater impacts by the below ground sections of the Proposed Scheme. The embedded mitigation would provide protection to the key aquifer formations, comprising the underlying Chalk and Lambeth Group, and the overlying superficial drift aquifer.
- 1.10.41 An operational impact was considered due to the design at Shaft 3 – Poyle which could constrain groundwater levels and flows in an already restricted area, due to historic landfill sites. This was assessed in detail and was determined to be negligible.
- 1.10.42 This preliminary assessment has concluded that following the application of embedded mitigation and construction management measures the Proposed Scheme is unlikely to result in significant adverse residual effects on hydrogeological receptors.

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Geology, soils and contaminated land

- 1.10.43 The assessment considered potential effects on geology (including designated geological sites), soils (including agricultural land quality), and controlled waters (groundwater and surface water).
- 1.10.44 The route of the Proposed Scheme has been refined to avoid specific areas of known contamination. Additionally, most other potential geology, soils or land contamination effects have been addressed through either embedded mitigation or by construction management measures included in the Draft CoCP.
- 1.10.45 Additional mitigation measures would be required during construction and operation to address the risk due to unexploded ordinance, potential ground gas risks and loss or sterilisation of mineral resources.
- 1.10.46 The only residual adverse effect would be the sterilisation of part of a Mineral Safeguarding Area. This is because the operation of Proposed Scheme would limit any future planned extraction works under and near to the Proposed Scheme. However, this land is subject to an approved planning permission by CEMEX. This planning consent would effectively deliver the extraction of this resource and based on this, no sterilisation would occur.

Materials and waste

- 1.10.47 The waste and materials assessment includes consideration of:
- the use and management of materials generated on-site that are considered as ‘non waste’;
 - the generation and management of wastes including hazardous, non-hazardous and inert waste; and
 - The use of raw materials in construction.
- 1.10.48 In order to construct the Proposed Scheme, materials would need to be used for the new structures including the tunnel lining, new walls, foundations, buildings, and track. The use of these materials would deplete resources available for other projects or uses. They would also contain embodied carbon with implications for climate change. Network Rail intends to reduce the potential risk of these impacts by promoting the reuse of materials within the project and using secondary material where reasonably practicable.
- 1.10.49 The Proposed Scheme would be likely to generate a large volume of surplus excavated material from the bored tunnels and other excavation activities.

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Network Rail intends to reduce the impacts of transporting this material by using a conveyor and sidings to remove the material from site by rail. In addition, Network Rail will seek to work with other projects to find a suitable use of this material elsewhere.

1.10.50 By maximising efficient resource use, selecting materials appropriately, taking into consideration the waste hierarchy as outlined by the Waste (England and Wales) Regulations 2011, this preliminary assessment has concluded that the Proposed Scheme is unlikely to result in significant adverse residual effects with regards to material use, waste generation and greenhouse gas emissions.

Socio-economics and community

1.10.51 This assessment considered the potential significant impacts on employment, economic investment in the region, recreation and tourism.

1.10.52 The main aim of the Proposed Scheme is to provide better access via public transport to Heathrow Airport. During operation this would generate long term socio-economic benefits to users of Heathrow Airport and businesses that rely on it.

1.10.53 The construction of the Proposed Scheme would also result in a beneficial socio-economic effect in the form of:

- increased availability of employment through the creation of a specific jobs and skills strategy offering apprenticeships, work experience, and local labour recruitment; and
- increased potential for investment in the local economy.

1.10.54 There would be a negative impact on socio-economic and land use during construction of the Proposed Scheme. In particular, there would be a temporary loss of 52 hectares of Grade 1 and 3 agricultural land mainly to the north of the bored tunnels for construction work areas. Network Rail intends to restore the land to its previous condition in order to reduce the long term adverse impacts. Accordingly, only five hectares of Grade 1 and 3 agricultural land would be permanently removed from productive use.

1.10.55 In addition, there would be the likelihood of impacts from traffic and transport on local businesses and their accessibility, as well as, road commuters' ability to access their employment due to potential road congestion resulting from traffic re-routing due to the

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closure of Hollow Hill Lane. A detailed junction assessment will uncover any issues that may cause bottlenecks and propose solutions to avert any congestion this could cause.

Human health

- 1.10.56 This assessment considers the potential human health effects resulting from the construction and operation of the Proposed Scheme.
- 1.10.57 Both beneficial and adverse effects to human health of the local community would be likely to occur as a result of the Proposed Scheme throughout the construction phase. Beneficial health effects would occur in response to the employment and training opportunities resulting from a beneficial effect on direct employment (e.g. construction jobs) and indirect employment (demand for goods and services) by the 'Proposed Scheme'.
- 1.10.58 Adverse effects would be likely to occur as a result of air quality emissions, dust or mud from stockpiles, noise and vibration emissions, impacts to transport and access to open spaces, and impacts to the social cohesion of the local community created by the closure of Hollow Hill Lane. Social cohesion

impacts occur through the creation of physical and perceived barriers within the local community.

- 1.10.59 During operation, beneficial health effects are expected as a result of the Proposed Scheme in response to the creation of operational jobs leading to employment, training opportunities and a reduction in air quality emissions on the wider network due to the modal shift from road to rail. Adverse health effects would be likely to occur as a result of driver stress (frustration, route uncertainty and fear of potential accidents), impacts to transport and access (adding time to journeys due to closure of Hollow Hill Lane) to open space (due to some spaces losing amenity due to proximity to new structures).
- 1.10.60 Additional mitigation measures which could minimise the impacts and promote the benefits to human health include;
- Network Rail's jobs and skills strategy to actively manage the employment benefits; and
 - native screen planting to screen and soften views and minimise loss of amenity
- 1.10.61 Potential health impacts reported at this stage are based upon a preliminary understanding of

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conditions and represent a precautionary worst case analysis. Further study will be required to confirm these conclusions for the Environmental Statement. On balance, overall impacts to human health are not expected to be significant as a result of changes from the Proposed Scheme.

Traffic and transport

1.10.62 The construction of the Proposed Scheme would generate potential additional traffic on the road network adjacent to the construction activities. The closure of Hollow Hill Lane would divert existing traffic from Mansion Lane and Market Lane to the alternative road crossings over the GWML, namely the B470 Langley Park Road, Station Road and Langley High Street, and Thorney Lane North and South. This would increase traffic flows on High Street (Iver) and Parlaunt Road, North Park and Richings Way. Approximately 25% of the existing traffic diverts to the road network around the area of study, and then approximately 67% of the remaining traffic flows travels down the B470 through Langley Park Road, Station Road and Langley High Street, while 33% of the remaining traffic flows travels down Thorney Lane.

1.10.63 Consequently, the most significant adverse effects are located along these routes named above, with an increase in driver stress and increased impacts on all road users along B470 Langley Park Road.

1.10.64 Construction traffic flow increases are low to negligible along the construction routes and the implementation of Construction Traffic Management Plan and Construction Workforce Travel Plan could reduce these impacts to negligible.

1.10.65 Temporary adverse impacts have been identified on Thorney Lane North and South during construction.

1.10.66 Effects during the operational phase of the Proposed Scheme are considered to be permanent, with the main impact coming from the closure of Hollow Hill Lane and the beneficial reduction of road users and rise of rail utilisation for travel to Heathrow Airport.

1.11 Cumulative effects

1.11.1 Cumulative effects occur when incremental environmental, social or economic effects caused by past, present and reasonably foreseeable future activities combine or interact in a particular location or within a particular timeframe to create additional impacts. Cumulative effects can occur during both construction and operation.

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1.11.2 There are two types of cumulative effects considered for this project. Intra-project cumulative effects occur when a receptor is affected in two or more different ways by the same project. Inter-project cumulative effects occur when a receptor is affected by more than one separate project.

1.11.3 Examples where intra-project cumulative effects are reported to occur include:

- the use of mobile and fixed construction plant;
- construction traffic; and
- spoil train loading and movements on spoil sidings.

1.11.4 The types of receptors noted as being susceptible to intra-project cumulative effects include both human and ecological receptors.

1.11.5 At this time the assessment of inter-project cumulative effects has been restricted to major applications which are expected to have the potential to result in new or additional significant cumulative effects to those reported for the individual environmental disciplines, these are:

- Heathrow Airport Expansion;

- CEMEX Mineral Extraction; and
- M4 Smart Motorways, Junction 3 to 12

1.11.6 The reported potential inter-project cumulative effects associated with these projects include effects on:

- Landscape character;
- Ecological receptors, including habitats and various species.
- Human receptors located in the proximity of the Proposed Scheme.
- The setting of and/or damage to cultural heritage assets.

1.11.7 Following consultation, the list of other developments to be considered within the final assessments will be revised and agreed in advance of the submission of the Environmental Statement to support the DCO application.

1.12 Summary of next steps

1.12.1 Each environmental topic area has been assessed in this PEIR based on available information. There are numerous steps to be taken by each topic area

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in order to complete the EIA and produce the Environmental Statement to support the DCO application. Key next steps include:

- Continued consultation with local authorities, landowners and statutory bodies to inform detailed assessments;
- Modelling and further environmental surveys to provide a robust baseline for assessments including road junction assessments;
- Confirmation of, and addition to, proposed environmental mitigation;
- More detailed assessment of impacts and effects to be produced as part of the EIA reported in the final ES;
- Completion of other assessment such as Unexploded Ordnance, Water Framework Directive and Flood Risk Assessments; and
- Preparation of draft licence applications for bats and the permanent and temporary closure of badger setts.

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List of abbreviations

CoCP – Code of Construction Practice

DCO – Development Consent Order

EIA – Environmental Impact Assessment

ES – Environmental Statement

GWML – Great Western Main Line

IVE – Iver (Footpath code for Iver, Buckinghamshire)

NTS – Non-Technical Summary

PEIR – Preliminary Environmental Information Report

RIB – Rail Intersection Bridge

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Glossary

Baseline data – Data used to describe the current conditions of the environment, against which future predictions can be made.

Code of Construction Practice (CoCP) – is a document which sets out proposed measures and standards of work to which the contractor(s) must follow to control potential impacts.

Development Consent Order (DCO) – A development consent order combines the grant of planning permission with multiple other consents that would otherwise have to be applied for separately (e.g.: listed building consent).

Environmental Impact Assessment (EIA) – Is an iterative process used to identify and predict beneficial and adverse impacts to the environment of a proposed project.

Environmental mitigation – is a measure or measures to avoid, reduce, remedy, or compensate for significant adverse impacts of the proposed project assessed by the EIA.

Environmental Statement (ES) – The final report documenting the findings of the Environmental Impact Assessment.

Generalised journey times – details the journey times allowing for the wait times at interchange stations for current access to Heathrow Airport.

Nationally Significant Infrastructure Project – are major infrastructure developments in England and Wales, which bypass the usual local planning requirements. The requirements for this are described in section 1.4.1.

Optioneering – Identification and evaluation of alternatives to achieve the goals of a particular project or plan.

The Planning Inspectorate – is an executive agency, which works with planning appeals, national infrastructure planning applications, and other planning-related and specialist work in England and Wales.

Scoping opinion – lays out what the decision making body believes should be assessed by the Environmental Impact Assessment.

Scoping Report – Is a document which identifies the types of environmental impacts to be investigated by the Environmental Impact Assessment and reported in the Environmental Statement.