Western Rail Link to Heathrow Strategic Outline Business Case Summary Document

The Western Rail Link to Heathrow Strategic Outline Business Case was produced during 2017 with many of the assumptions agreed, and economic analysis undertaken, during the first half of the year. The assumptions in this document reflect the early stage of the scheme's development and as such, are susceptible to change and do not necessarily represent government policy. In producing this summary document for the Stakeholder Steering Group, the Client Team has reflected some of these changes in order to aid the reader, but not where these would affect the underpinning analysis. Many of these assumptions will be updated as the scheme moves towards Outline Business Case stage.

It should be noted that this document is a summary of the SOBC which has been produced, in accordance with the Rail Network Enhancements Pipeline framework and existing governance arrangements. Any conclusions reached in the document do not represent a final decision by the Department.

Contents

Acronyms and Abbreviation

APF - Aviation Policy Framework

BCR – Benefit Cost Ratio

BICC – Board Investment Commercial Committee

CAA – Civil Aviation Authority

CAGR - Compound annual growth rate

CTA - Central Terminal Area

DCO - Development Consent Order

DfT - Department for Transport

EC4T - Electricity Charge for Traction

GJT - Generalised Journey Time

GRIP - Governance for Railway Investment Projects

GWML - Great Western Main Line

HAL - Heathrow Airport Limited

HESAM - Heathrow Employees Surface Access Model

HLOS - High Level Output Statement

HMT - Her Majesty's Treasury

HEx - Heathrow Express

HRA - Heathrow Rail Access

IRC – Investment Recovery Charge

LASAM - London Airports Surface Access Model

LEP - Local Enterprise Partnerships

MoU - Memorandum of Understanding

NPB - Net Present Benefits

NPPF - National Planning Policy Framework

NR - Network Rail

ANPS - National Policy Statement

OBC - Outline Business Case

OOC – Old Oak Common

ORR – The Office of Rail and Road

RIB – Rail Investment Board

RNEP - Rail Network Enhancements Pipeline

SOBC - Strategic Outline Business Case

SRLtH - Southern Rail Link to Heathrow

SRN – Strategic Road Network

T5 – Heathrow Terminal Five

TfL – Transport for London

TOC – Train Operating Company

Tph - Trains per hour

VfM - Value for Money

VTAC - Electric Variable Track Access Charges

WRLtH - Western Rail Link to Heathrow

1. Introduction

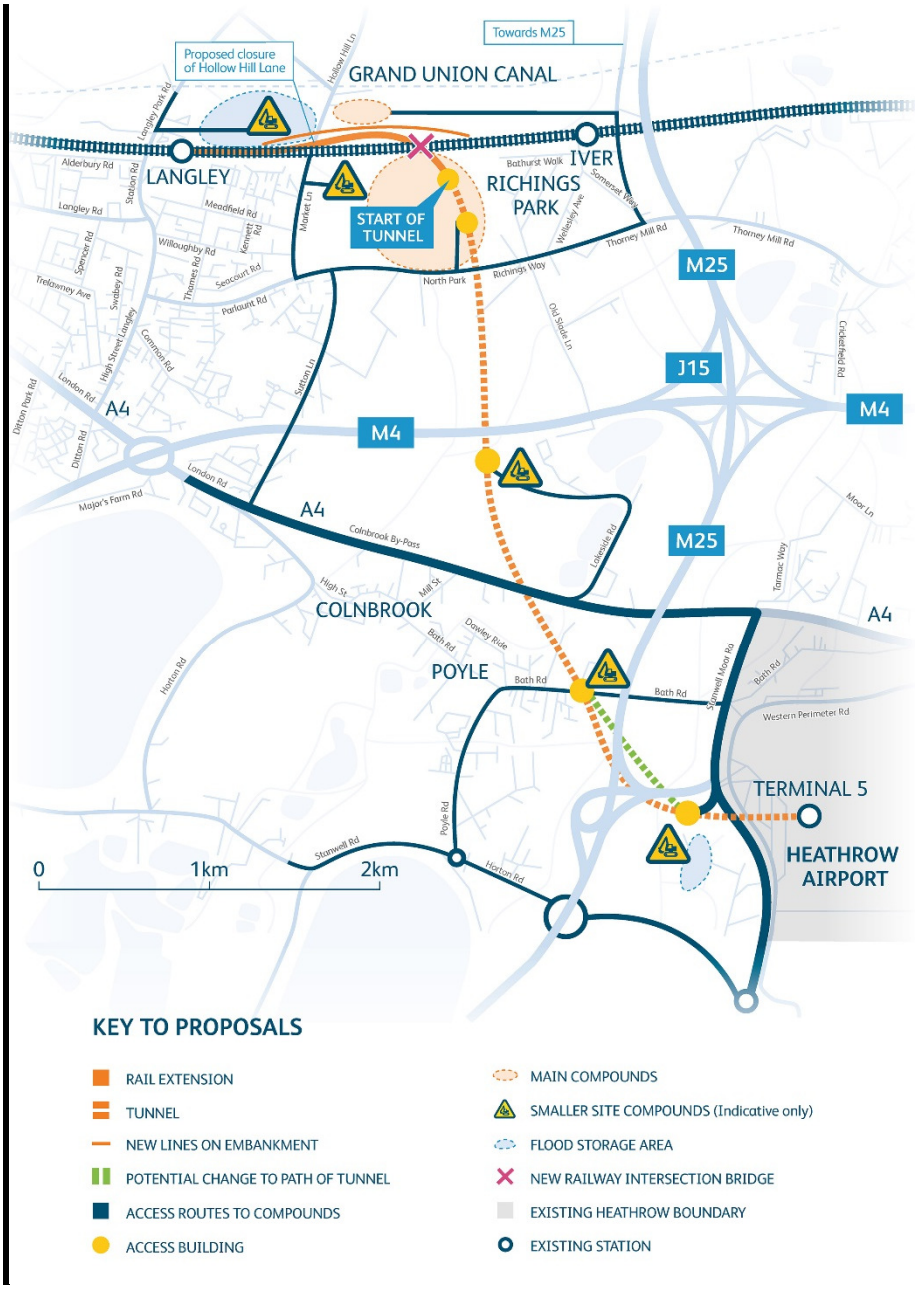
The Western Rail Link to Heathrow (WRLtH) project is a proposal for a new rail link between Langley Station on the Great Western Main Line (GWML) and Heathrow Airport Terminal 5 (T5), as shown below.

Currently Heathrow Airport is well served by the Piccadilly Line, Transport for London (TfL) Rail and Heathrow Express (HEx) rail connections to central London. However, there are limited options for rail passengers travelling to and from other destinations, in particular, to the west of Heathrow. The WRLtH project aims to address this by enabling new direct rail services to run between Reading and Heathrow and on towards London.

Trains serving Heathrow would use the existing rail lines between Reading and Langley and would then transfer to a new rail link east of Langley. The new lines for the WRLtH would be located between the existing Relief Lines and Main Lines on the GWML.

In January 2017, the Secretary of State for Transport instructed that the Western and Southern rail links to Heathrow should be planned holistically, and brought together as a single programme, with a phased construction approach as part of an integrated assessment. As accurate modelling impacts for the Southern Rail Link to Heathrow (SRLtH) scheme are not yet available, WRLtH is assessed independently in this analysis.

PROPOSED WRLTH ROUTE



The 6.5km scheme consists of a short stretch of open railway that would leave the GWML between Langley and Iver. It would then descend underneath the main railway line into a cutting before entering a 5km tunnel. The tunnel would pass under Richings Park and Colnbrook and then merge with existing rail lines underground at Heathrow T5. The new tunnel would require up to five access buildings above ground along the route, with two of these buildings also providing ventilation.

A number of studies have taken place over recent years to determine the best route for this new rail link. The proposed route is the preferred option on engineering, financial and sustainability grounds.

It is proposed that the train service using the line would comprise of four trains per hour (tph) in each direction between Reading and Heathrow Terminal 5 (T5), with a 26 minute journey time, calling at Slough and alternately at Maidenhead and Twyford, and then on towards London.

The WRLtH project interfaces with the wider programme of works to electrify and enhance capacity on the GWML. It is also dependent upon the Crossrail project.

Background

The Department commissioned Network Rail (NR) to undertake an initial feasibility study in late 2008 to test the feasibility of WRLtH as a concept. A tunnel option from Colnbrook to Heathrow T5 was assessed due to it being in a logical position to connect to the GWML. The report was based on a number of assumptions but concluded that it was feasible (in engineering terms) to connect to the airport via a tunnel.

Separately, a pre-feasibility study was commissioned by Slough Borough Council on behalf of the Berkshire Strategic Transport Forum in 2009. Six options were assessed and it was found that heavy rail options at Langley or Colnbrook had the highest likelihood of achieving a positive benefit cost ration (BCR). A summary table of the results is shown below:

Schemes	Estimated Total Cost (2009)	Constructability	Positive BCR
Re-engineered Airport Junction to allow direct access from GWML	£359m	Very complex & very risky	Possible
Extension of Piccadilly Line direct to Slough via a direct route	£1,255m	Moderate complexity & some risk	Unlikely
Extension of Piccadilly Line to Slough via the Windsor Lines	£781m	High complexity with high risk	Very unlikely
Heavy Rail 5km tunnel connecting T5 to Langley on the GWML	£761m	Moderate complexity & low risk	Probable
Heavy Rail extension from T5 to Slough via a new grade separated junction at the north end of the Colnbrook branch	£453m	Complex & medium risk	Likely
Modified Heathrow Hub – Extension of Piccadilly Line to a new Interchange station at intersection with GWML near Iver	£809m	Some complexity & high risk	Very unlikely

In 2012, NR took on further development of the scheme following the High Level Output Specification (HLOS) for Control Period 5 (CP5, 2014-2019). A further internal appraisal was undertaken during this year as part of a Governance for Railway Investment Projects (GRIP) 2 study with the options at Langley and Colnbrook taken forward for review. Four infrastructure options at the two sites were assessed as set out below:

Option 1A: Connection via the Colnbrook branch, with tunnel portal south of the M4

Option 1B: Connection via the Colnbrook branch, with tunnel portal north of the M4

Option 2B2: Connection via Langley, with underbridge taking the line beneath the GWML

Option 2B3: Connection via Langley, with viaduct taking the line over the GWML

A connection via Langley with an underbridge taking the line beneath the GWML was found to be the most viable option and was appraised as the central case. This decision was taken for a number of reasons, such as:

- **Options 1A and 1B** would add approximately 4 – 5 minutes to the rail journey time compared to the Langley options, eroding the key benefit of the scheme.
- **Option 2B3** would create significant visual intrusion from the viaduct over the GWML.
- **Option 1A** would have to include a single track section under the M4/M25 interchange (there being insufficient space to put in a second track). This single track section would need to accommodate the proposed passenger service as well as freight services, introducing significant operational risks.

In 2015, after these previous appraisals, NR reviewed the Langley branch proposal against 4 alternative options:

- **An alternative Langley branch alignment:** An alternative alignment connecting the GWML to the east of Langley station with a new tunnel to Heathrow).

- **The Dachet Branch:** An alignment making partial use of the existing Staines to Windsor & Eton Riverside and Windsor & Eton Central to Slough branch lines.

- **West-facing Heathrow Branch:** An alignment 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 Colnbrook Branch:** An alignment 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 option was selected on the basis that it avoids sites of special scientific interest and would be least disruptive to the local community and environment as well as providing the best opportunity to improve capacity and deliver the fastest journey times.

This option was subject to formal public consultation in 2015 when the outline details of the scheme and early indicative alignment were shared with people living in the vicinity and those with interest in the wider area. 88% of respondents indicated that they strongly agreed with NR's proposals to improve rail access to Heathrow from the west. A second consultation was carried out in 2016 where the options at Langley station were shared with people living in the vicinity and those with interest in the wider area. The feedback received informed further detail design of the scheme as it continued to develop. An initial environmental impact assessment was also carried out to support the consultation.

Current Project Status

The WRLtH Strategic Outline Business Case (SOBC) was developed over 2017 and was endorsed by the Department's Board Investment Commercial Committee (BICC) on 5 February 2018, this enabled WRLtH to progress into the 'Develop' phase of the Rail Network Enhancements Pipeline (RNEP). The Committee also agreed the removal of a shuttle service from further appraisal due to it representing poor Value for Money (VfM). *See Figure 12 in the Economic Case.*

The SOBC reflects the fast moving and complex landscape that the WRLtH Project has been developed within. Recognising the current stage of scheme development, the SOBC is focused on making the case for change and appraising the options available to recommend a preferred way forward. It is recognised that this will require further analysis within the Outline Business Case (OBC) and that many of the assumptions made at SOBC will change and mature as part of the iterative business planning process.

The key assumptions made at SOBC were:

- Infrastructure programme: this was baselined on a conventional procurement methodology.
- Infrastructure into use date: following the Hendy re-plan, delivery was deferred to CP6. The Strategic Case was developed on this assumption. As a result of a series of changes, including the work to define the potential interface with a proposed HEx Depot at Langley, NR have subsequently re-baselined their programme for efficient delivery, which would now see construction completing by around 2027.
- Heathrow Airport expansion: the central case was predicated on the existing two runway Heathrow Airport, but a sensitivity test provides a comparator for a third runway.
- Heathrow Airport Limited (HAL) contribution: as set out in the 2012 HLOS, delivery of WRLtH is subject to 'the agreement of acceptable terms with the Heathrow aviation industry'. The SOBC did not seek to quantify the level or form of this contribution.
- Train Operating Company (TOC): WRLtH is unusual in that there are different options for the scheme operator. The SOBC 'through' option assumed that WRLtH would operate as an extension of existing HEx services to T5, however as part of the OBC we will be testing a number of potential operators and service options.

Since the SOBC was approved a number of key milestones have been achieved:

- The agreement between First Group and HAL, which will see the Great Western Railway take over the operation of HEx from August 2018, resolved a key uncertainty for the project by removing the potential interface with a new HEx Depot at Langley.
- A Market Sounding exercise has been launched to assess the market appetite in respect of third party investment and contracting participation in the WRLtH project.
- NR have undertaken and are now considering the responses to their Statutory Consultation on their preferred scheme design, a key step towards the submission of a Development Consent Order (DCO) application to the Planning Inspectorate.
- NR have completed a Requirements Review which has anticipated capital and significant programme and risk benefits. The project will be looking to implement these in the coming months.

- Discussions have been ongoing with Crossrail regarding operational feasibility, there are also discussions planned with Great Western Railway over the summer.
- Work has commenced on the production of an OBC for the scheme with the aim of completing this in early 2019.
- CEMEX mineral extraction has started in the field south of the railways between Langley and Iver stations. The project is working closely with them to understand the impact of constructing at the same time as CEMEX.
- The Department's Airports proposed Airports National Policy statement (ANPS) was laid on 5 June 2018 and designated on 26 June 2018
- HAL have started their DCO development and have carried out a first round on public consultation, the project is working with Heathrow to understand how the two schemes will fit together.

Summary of Business Case

1. There is a strong **Strategic Case** for taking forward WRLtH in a two runway scenario and a three runway scenario. It would provide the opportunity for passengers to travel directly to Heathrow Airport from the West with improved journey times and will contribute to modal shift and road decongestion on some of the busiest motorways in the UK.

2. The **Economic Case** sets out that the scheme is medium VfM in a two runway scenario, increasing to high VfM in a three runway sensitivity test.

3. The **Financial Case** considers the current uncertainty surrounding future funding of railway enhancements and outlines that WRLtH requires considerable capital investment with delivery likely spanning Control Period 6 and 7. In line with Her Majesty's Treasury (HMT) Green Book guidance, a range of options for financing will be considered to deliver best VfM to passengers and taxpayers, as well as allocating risk to the organisation best placed to manage it, whether in the public or private sector.

4. The **Commercial Case** builds on the Financial Case and explains that there is reasonable evidence to conclude that a part-privately financed transaction for this Project would be feasible. However, to ensure VfM, the accounting treatment is vital. This will be developed through OBC.

5. The **Management Case** highlights the complexity of the interfaces faced by the project and the governance in place to ensure that the scheme's benefits are realised. The Case notes that the alternative funding and delivery models proposed for WRLtH could spark a marked change in the way the Department and NR manage the Project.

2. Strategic Case

Objectives

In the 2012 High Level Output Specification (HLOS) for CP5, Government set "improving railway links to major ports and airports" as one of its strategic priorities for the railway. In support of this, the Secretary of State asked industry to develop plans to build a new railway link to provide western rail access to Heathrow Airport with the aim of improving access for both business and leisure travellers and the airport workforce. It stated that such a scheme would "provide a major boost to the airport's accessibility, substantially reducing Heathrow Airport journey times from Wales and western England, supporting the extension of the vibrant Thames Valley economy westwards, and complementing the proposed high speed rail access".

The original objectives and outputs of the WRLtH Project remain unchanged, although it is recognised that the benefits will now not be fully realised until Control Period 7 (CP7, 2024-2029).

The four strategic aims of WRLtH are:

- to deliver transport user benefits through faster and more reliable airport access;
- to deliver road decongestion and mode shift, by providing a much-improved rail connection which will reduce people's reliance on the road network;
- to facilitate economic growth; and
- to deliver an affordable project on time and within budget.

Following the Secretary of State's agreement to bring WRLtH together with SRLtH under a single Heathrow Rail Access (HRA) Programme it was also decided that a set of overarching 'Programme Aims' should be developed. Work has been undertaken to agree these 'Programme Aims' with key stakeholders (NR, HAL and TfL) and they will align with and complement the agreed WRLtH aims and the Department for Transport's (DfT) 'Strategic Aims'.

The HRA Programme: Strategic Aims

The HRA Programme seeks to deliver a step-change in rail accessibility, opening up new markets across the South and South West and relieving congestion at London Paddington and Waterloo. Planned holistically alongside other nationally significant infrastructure projects, such as HS2 and Crossrail, it will provide an attractive alternative to the heavily congested road network, where few other strategic infrastructure alternatives exist.

The strategic aims are to:

- **Encourage modal shift and reduce road congestion**: providing regular services to encourage air passengers and airport employees travelling to and from Heathrow to transfer from cars to rail, contributing to reduced road congestion.
- **Reduce environmental impacts**: reducing reliance on private vehicle and taxi in these key markets to deliver net air quality, noise and greenhouse gas benefits as users transfer from diesel and petrol car to sustainable transport modes.
- **Connect communities**: improving connectivity and providing new journey opportunities, especially to areas of high demand and where limited options mean that a low public

transport mode share currently exists. To provide greater choice of surface access mode, competitive generalised journey times and increase reliability of journeys.

- **Minimise the impact on current and future passenger and freight journeys and services**: any proposals should not be at the expense of non-airport journeys, or undermine the ability of the network to meet future background demand.
- **Boost economic growth and encourage regeneration**: providing greater accessibility to employment locally, nationally and internationally, facilitating catalytic impacts, and improving productivity and outputs in the UK economy.
- **Enhance our global competitiveness by making Britain a more attractive place to invest:** The transport sector makes trade possible. Investors need effective international connections to access new markets, integrate operations into their global supply chains and to conduct business efficiently. The UK is already well placed to meet these needs, but we are in constant competition with other countries to attract global business.
- **Be deliverable:** considering the safety impact of all enhancements to our railways will always be paramount. Government will also be mindful of the implications for and impacts on the reliability of the network and the provision of services that delivery of the enhancement might have both during construction and after implementation.
- **Be affordable and value for money**: to maximise operating surplus and reduce the need for public subsidy. To levy contribution to the capital costs of the scheme in order to provide value for money for rail customers and taxpayers.

The HRA Programme is not reliant on any future decisions on airport expansion.

Investment Aims

The main strategic aims of WRLtH have been summarised into four key components - Transport User Benefits, Road Decongestion, Economic Growth and Affordability/VfM.

Transport user benefits

By providing direct rail services, WRLtH would reduce actual and generalised journey times for air passengers and airport employees between the airport and Reading, and other locations. It would also contribute to relieving rail congestion at some stations and lines (particularly Paddington and the Piccadilly Line) and reduce overcrowding on trains for other rail users as interchanges at Paddington of Heathrow passengers travelling from the West.

The rail link would enhance the public transport connectivity of Heathrow with more passengers able to access Heathrow via one interchange at Reading, supporting Heathrow and UK aviation.

Aim	Appraisal metrics
Journey time savings	WRLtH trip and generalised journey times from origin to destination, and comparable metrics for current PT and road journeys. Heathrow employee residential location to gauge accessibility to WRLtH services.
Network reliability and passenger experience	Assess the WRLtH passenger demand level of abstraction from existing rail services, accounting for release of constrained demand.

	Average variability of travel time in Heathrow road access network compared with anticipated WRLtH performance metrics. Customer/ Stakeholder survey of passenger experience
Heathrow connectivity	Assessment of UK rail network connectivity to Heathrow post WRLtH implementation.

Road decongestion and modal shift

WRLtH would encourage air passengers and airport employees travelling to and from Heathrow to transfer from cars and bus/coach to rail and contribute to a reduction in road congestion on the M25, M3, M4 and other roads in the vicinity of Heathrow. Shift from cars is forecast to be the source of about 40% of WRLtH trips, with bus/coach providing 20%. This would deliver accident reductions, as well as noise and air quality benefits as there are currently high congestion levels on these motorways.

Aim	Appraisal metric
Reduction in road use for Heathrow access	Reduction in journeys on the motorways and access roads surrounding Heathrow Reduced congestion
Increased use of public transport for Heathrow access by employees and passengers	Public transit mode share increased
Reduction in accidents, noise and greenhouse gases (improving air quality)	Reduction in accident rates Reduction in traffic noise Greenhouse gas emissions savings modelled to reduce by 2035

Facilitate economic growth

The enhanced public transport connectivity to Heathrow provided by WRLtH would encourage firms to invest, create jobs and increase economic output at Heathrow, in the Thames Valley and nationally. WRLtH would create short term jobs during its construction and longer term employment during its operation and maintenance. Reduced congestion on the surrounding road network could also improve road travel times, also increasing local area productivity.

Aim	Appraisal metric
Private sector investment into the regions	Inward investment into regions after WRLtH implementation
Productivity Increase	Gross Value Added increase by 2035 for Thames Valley Local Enterprise Partnership (LEP) and surrounding regions compared to the baseline

	Job increases for Thames Valley LEP and surrounding regions compared to baseline
Access to job opportunities at Heathrow	Increase of population within 60 minutes travel time to access Heathrow

Affordability and VfM

It is an objective that the revenues from WRLtH provide an operating surplus, negating the need for any ongoing public subsidy and contribute to the capital costs of the scheme, providing VfM for rail customers and taxpayers.

Analysis performed by NR indicated that WRLtH will have a positive net revenue contribution over a 60-year appraisal period.

Aims	Measures
Commercially viable operating service	Annual operating surplus provides revenue stream to help meet funding requirements.

Policy fit

The Thames Valley Region is subject to a number of investment and infrastructure programmes. The WRLtH Project has positive synergies with other major projects/programmes by:

- reducing congestion at Old Oak Common (OOC) and Paddington: taking around 800,000 journeys away from those stations, reducing pressures on OOC (HS2), Paddington and Crossrail;
- capitalising on the Great Western Electrification Programme (increasing services from the West to London Paddington): WRLtH enables new journey opportunities and helps to provide greater capacity between Paddington and Reading on the relief lines;
- supporting the Government's statement of preference for a North West Runway at Heathrow: WRLtH helps increase surface access provision to the airport; and
- complementing the South West Quadrant study carried out by Highways England to assess future road capacity on that part of the Strategic Road Network (SRN): highlights that there are few strategic alternatives available to expand the SRN network (M25, M3, M4, and A4) around Heathrow.

Case for Change

Direct rail access is not currently possible from the West due to physical constraints of the track. Passengers wishing to access Heathrow Airport from the West via public transport currently have three logical options:

- transfer onto a rail/air coach at Reading;
- travel past Heathrow to Paddington on the GWML and then travel back to Heathrow using HEx or Heathrow Connect services. From 2026/27 a new interchange will be available at OOC to Crossrail; or
- use a local rail service to Hayes & Harlington and change onto Heathrow Connect services.

Each of these options requires significant travel time to access Heathrow. Viewing Reading as an example origin destination, journey times to Heathrow on these public transport modes range from 42 to 58 minutes while the Generalised Journey Times (accounting for service frequency and interchanges) range from 82 to 97 minutes. The higher range of these times do not compare favourably to the estimated 38 minute drive time, indicating that a reduction in the number of interchanges or travel time may facilitate behaviour change in passengers mode choice.

WRLtH is not predicated on, nor assumes, airport expansion (the economic appraisal runs a sensitivity on a third runway). However, the Government has issued a statement of preference for a North West Runway at Heathrow and WRLtH was included as part of the Department's proposed ANPS which was laid in parliament on 5 June 2018 and designated on 26 June 2018.

Existing road access from the West carries high volumes of traffic relative to capacity, particularly on the section of the M25 between the M40 and A3, the busiest section of motorway in the country, which experiences high levels of congestion.

Internal Business Drivers

Heathrow as a Transport Hub

Heathrow handles more than 70% of the UK's long-haul flights and carries more freight by value than all the UK's other airports combined. Civil Aviation Authority (CAA) data for 2016 shows that the airport processed 75.7 million terminal and interlining passengers and was the world's second busiest airport for international passenger traffic. It is the largest passenger airport in Europe and is the primary base for British Airways. To seize the full benefits that Heathrow Airport has to offer and realise the benefits of a potential future expansion, passengers and users must have better access to the airport. In light of this, Heathrow Airport have developed a sustainable transport plan which aims to protect and enhance Heathrow's status as a fully integrated transport hub at the heart of the UK transport system. The plan acknowledges the role that surface access places in the end-to-end journey and its key strategic aims align well with WRLtH.

A Third Runway at Heathrow

Whilst the business case is not predicated on or dependent on the construction of a third runway at Heathrow it would further strengthen the business case. The table below shows forecast Heathrow terminal passenger demand by region for two and three runways. Demand is forecast to increase by approximately 28%. Terminal passenger demand excludes interlining passengers who generally do not leave the airport site and hence do not require surface transport. This equates to an additional 16.6 million passengers requiring surface access to the airport, with 11.2 and 5.4 million additional passengers using road and rail respectively, putting extra pressure on the already saturated road network.

Sector	2 runways	3 runways	% increase
London	30,400,000	39,000,000	28.1%
SE England – E	3,000,000	3,800,000	28.0%
SE England – W	12,100,000	15,500,000	28.0%
South West England and Wales	5,600,000	7,200,000	27.6%
East Midlands	2,000,000	2,500,000	27.4%
West Midlands	1,500,000	1,900,000	27.3%
East Anglia	3,700,000	4,700,000	27.5%

Rest of UK	1,500,000	2,000,000	27.4%
TOTAL	**59,900,000**	**76,700,000**	**27.9%**

Employment at Heathrow Airport in 2035 is forecast to increase from 82,650 to 109,000 with a 3-runway scenario. The table below shows the daily mode share and traffic results with two and three runways with committed improvements to Crossrail and tube services but without WRLtH. With three runways, the percentage of airport employees abstracted from car to public transport is forecast to increase by 7% points. This may be due to increased congestion on the road network and car parking, causing employees to shift to rail.

2 Runways	Car	PT	Other	Car park occupancy	Daily car trips inbound
2 Runways	49.7%	40.8%	9.5%	14,671	18,595
3 Runways without other mitigation	42.7%	47.8%	9.5%	13,885	17,599

DfT UK Aviation Forecasts 2017

DfT's air passenger forecasts following expansion scenarios shows a faster uptake of additional runway capacity compared with the Airports Commission 2013 forecasts used in the WRLtH modelling in this SOBC. The DfT forecasts were published after the economic analysis for the SOBC had been completed. If these forecasts are realised, then surface access will be under greater pressure more quickly, and the resulting passenger demand for WRLtH may also increase faster than forecast in this SOBC, generating greater benefits and revenue

The forecasts below show how the new forecast for 2030 is 2.6 million passengers (3.8%) higher with two runways and 6.9 million passengers (8.9%) higher with three runways, compared with the Airports Commission forecasts. In either scenario, this will likely have a positive impact on the case for WRLtH.

Heathrow Airport non-Interlining Passenger Demands (millions)									
Scenario	2030			2040			2050		
	AC Forecast	TR17 Forecast	Diff	AC Forecast	TR17	Difference	AC Forecast	TR17	Diff
Heathrow 3 Runway	78.7	85.7	6.9	96.9	99.9	3.0	112.4	115.6	3.2
Baseline	65.1	67.6	2.6	77.1	78.6	1.4	87.6	88.9	1.2

External Business Drivers

Surface Access Requirements

The Department's Airports proposed ANPS was laid on 5 June 2018 and designated on 26 June 2018 following two consultation exercises and an inquiry by the Transport Committee. It outlined the need and requirements for additional capacity and infrastructure at airports in the south-east of

England. It noted that the UK aviation sector is the third largest in the world, contributing around £20 billion per year to UK economy and directly supporting approximately 230,000 jobs.

However, London and the South East are facing longer term capacity problems and the whole London airports system is forecast to be full by the mid-2030s. The ANPS sets out the need for additional airport capacity in the south-east of England and identifies a third runway at Heathrow as the best option. With the need for additional capacity at airports comes the need for improved surface access.

The ANPS also sets targets for passenger mode share and limiting the number of employee car trips.

Additionally, The Aviation Policy Framework 2013 (APF) states that new planning applications by airports "must be accompanied by clear surface access proposals which demonstrate how the airport will ensure easy and reliable access for passengers, increase the use of public transport by passengers to access the airport, and minimise congestion and other local impacts."

Economic Development of the Thames Valley

The current poor rail offering to Heathrow from the West and South means that most air passengers and airport employees from these regions use the heavily congested M25, M3 and M4 road network to access the airport. It is predicted that demand on the road network will continue to grow without further intervention, putting substantial strain on road access to Heathrow and potentially compromising the region's economic competitiveness.

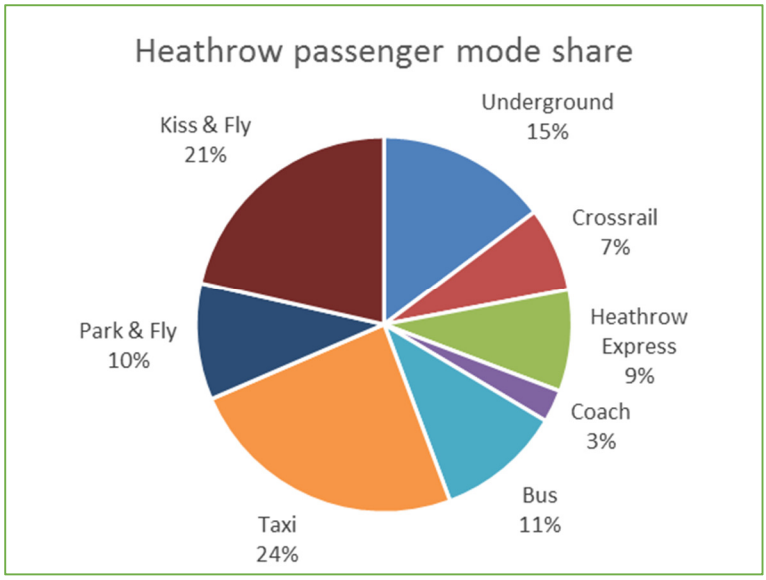
Constraints on the M25

Heathrow has been achieving passenger growth, despite constraints on the number of aircraft movements, by airlines prioritising long haul routes, and increasing aircraft size and aircraft load factors. This increases demand on surface access trips on an already congested network.

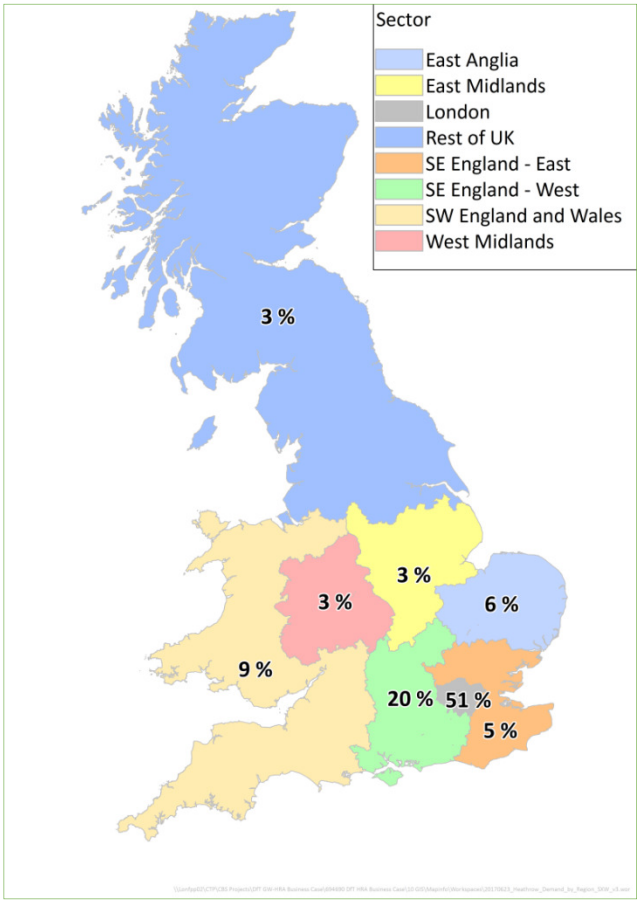
The road network accessing Heathrow from the West is extensive but constrained: the M25 between the M40 and A3 is the busiest section of road in the country and experiences heavy levels of traffic. Options for significantly increasing highway capacity are limited and people are encouraged to use more sustainable modes to travel including rail connection to Heathrow from the South and West.

Issues with Existing Arrangements

Modelling shows that in 2024 70% of Heathrow passengers will access the airport using the supporting road network by car, taxi, bus or coach.



In 2024, it is forecast that a high proportion of demand for Heathrow airport will originate from the West. As shown below, the western portion of South East England will account for 20% of demand and 9% will come from South West England and Wales.



Due to current poor rail links to Heathrow from the west, 97% of users from these areas are forecast to access Heathrow by car, taxi, bus and coach.

The figures are broken down below. For the public transport mode share to be improved, it is imperative that there is suitable provision of alternatives to car use to allow more choice for the airport passenger and employee. This is particularly true from the south west England and Wales.

	2024, 2 runways		2035, 2 runways		2035, 3 runways unmitigated	
	Road	Rail	Road	Rail	Road	Rail
Amersham Br	155,500	1,600	164,600	1,600	240,700	2,100
Beaconsfield	170,300	1,600	196,600	1,800	232,400	2,000
Bicester	67,200	5,900	76,100	9,400	101,600	12,300
Bracknell	270,800	5,300	366,000	6,800	435,200	7,000
Camberley	208,000	7,900	242,400	10,800	295,300	16,400
Charlbury	85,200	4,100	90,500	5,300	110,100	6,000
Didcot Parkway	167,600	17,900	194,500	21,000	263,700	22,500
Farnborough	114,700	6,000	136,100	8,100	174,300	9,100
Farnham	60,100	3,900	67,500	4,100	87,600	4,100
Fleet	135,800	2,100	150,200	2,500	193,200	4,700
Godalming	73,500	6,200	82,700	6,600	107,600	6,700
Guildford	375,300	30,400	432,600	42,200	571,200	51,900
High Wycombe	335,500	2,400	375,600	3,400	499,000	3,300
Maidenhead	615,600	9,200	737,000	10,000	931,100	12,500
Oxford	833,600	37,100	954,200	55,700	1,226,000	51,900
Radley	158,400	5,700	160,200	4,900	200,500	5,100
Reading	677,700	10,400	799,500	13,400	1,035,800	14,800
Slough	381,700	12,700	478,200	19,700	600,600	27,300
Staines	202,400	100	225,600	200	290,100	100
Virginia Water	282,000	600	339,700	800	455,800	800
Weybridge	346,100	1,700	438,100	2,200	537,000	1,700
Woking	324,400	3,700	381,400	5,200	500,300	6,900
Wokingham	265,700	4,100	333,900	6,100	433,100	7,300
TOTAL	**6,306,900**	**180,900**	**7,423,200**	**242,300**	**9,522,000**	**276,500**
	97%	**3%**	**97%**	**3%**	**97%**	**3%**

Impact of not changing

Options

In accordance with business case guidance, options other than WRLtH have been assessed and are summarised below:

Do nothing option – Base Case

The main access from the West of England to Heathrow Airport is by the M25 and M4 road network. With further widening an undesirable option (see following section on widening), if no strategic interventions are undertaken it is forecast that the number and severity of congestion and incident occurrences on the road network will become progressively worse to 2035.

Overcrowded roads will result in reduced productivity and negatively affect business, including freight where loads will cost more in fuel and journey times to reach the end destination.

This could be partially mitigated by increased bus and coach use, but these modes are also vulnerable to congestion.

Growing congestion and associated delays will negatively impact the economy as individuals will look for work elsewhere to avoid congestion and delays.

Widen the road network – Create additional capacity on the existing road network

Further highway widening could support the additional demand, however physical, environmental and cost implications make further widening an undesirable option.

Moreover, the National Planning Policy Framework (NPPF) developed by the Department for Communities and Local Government sets out the baseline for the promotion of sustainable transport and recognises the need to "balance the transport system in favour of sustainable transport modes, giving people a real choice about how they travel". The NPPF adds that "Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion".

Behavioural change: Tolling / cordon charge; subsidised public transport; new technologies

Demand could be reduced with a pricing structure making it less attractive for commuters to travel by road.

The road network to the west of Heathrow forms an important basis to the local economy and the implementation, operating and enforcement costs could be large and fall on airport and non-airport users. Extending road tolling is currently not UK Government policy and there is likely to be significant political risk associated with this strategic intervention.

Accordingly, tolls on the motorways may not be a viable option. However, a cordon charge for vehicles to access Heathrow airport could stimulate mode shift to achieve intended targets. It would have lower implementation, operating and enforcement costs and fall more on airport users. However, it is likely, with current public transport links, entry charges into Heathrow would only form part of a wider solution towards increased public transport mode share. A Heathrow congestion charge may be more widely accepted politically if other surface access options are made available to the passenger in order to effect the desired outcomes of any expansion at Heathrow.

On the other hand, subsidised public transport could have a similar impact on the attractiveness of public transport over private transport to Heathrow. Subsidising users' fares for public transport presents good economic justifications through environmental and decongestion benefits, but will require an external and sustainable source of funding (often public money). It is to be noted that the impact of subsidies will differ from one socio-demographic group to another and that, for instance, we would expect to observe a lower impact on high-income individuals than on low-income people.

Problems can also arise if subsidies of public transport do not improve the quality of the service at least proportionally to the increase in ridership and if a sufficient level of public transport is not available as an alternative to private modes. This argument may, therefore, support the need for alternative public transport access to Heathrow from the West, such as WRLtH.

A further option would be the use of intelligent technology that aims to optimise the movement of people on the road. Intelligent technology, tracking passenger or employee behaviour could be used to build appropriate and personalised mobility recommendations. However, for such recommendations to be effective, improved surface access and alternative transport modes will be required to allow the system to reallocate and efficiently balance the traffic between different routes.

Additional options to modify users' behaviour could be considered such as further incentivising airlines to sell public transport tickets, as add-ons or during flights, reducing car park spaces for passengers and/or employees, or placing car park drop offs further away from terminals for instance. The potential of these measures to influence passengers and/or employees to opt for public over private transport is uncertain and likely to be limited. In parallel to those options, adequate alternative to private transport would need to be available to users in order to not penalise them.

Park and Ride

Alongside the development of new rail access and road interventions to Heathrow, Park and Ride could be a potential option to be considered when looking at ways of reducing car trips and congestion on the road network around Heathrow.

Traditionally, park and ride options include a park and coach service from a convenient location near to the strategic road network. This conventional approach is the one used at Heathrow Airport, with most park and ride locations being just 10 to 15 minutes away.

Park and ride (park and rail) services are also often provided at railway stations and offer frequent services to an airport. However, the constraint for park and rail at Heathrow are that the GWML and the M4 do not run in parallel to each other and therefore road connections from the motorway to the railway stations would need upgrading, and in any event, would add a journey time penalty. It would therefore be necessary to look at stations closely aligned with the M4 such as Langley, Burnham or Datchet. Those areas are already often densely built up and offer limited space for significant car parks.

Careful consideration also needs to be given to the capacity of the rail network in order to accommodate a park and rail operation.

Bus and coach access, rail-air bus

Bus and coach services to Heathrow will continue to expand as passenger numbers grow but congestion and associated delays will constrain the demand on those networks and make it challenging for bus and coach services to provide an advantage to other modes. The development of

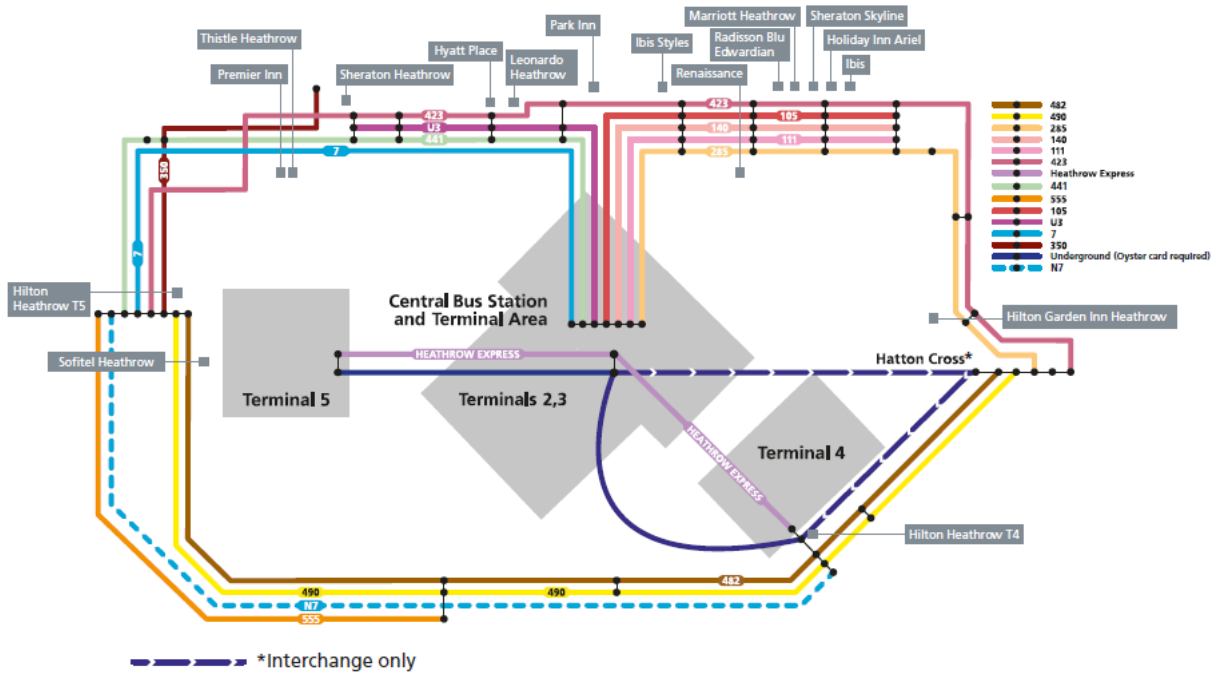
coach services to Heathrow airport will follow a logic of commercial viability and ultimately be down to individual operators.

National Express, Megabus.com and other operators currently run services between Heathrow and over 500 destinations, including several stations (Reading, Watford Junction, Woking and Feltham) forming the rail-air offer. Journey time on the Reading rail-air coach is comparable to the journey time on competitive rail alternatives (Crossrail, HEx via Paddington or Hayes and Harlington) but is subject to traffic conditions and increasing level of congestion on the road network. The WRLtH offers a significant reduction in journey time and better journey reliability.

Bus and coach services, including rail-air services do not alight at all terminals but stops at the Central Bus/Coach Station which is located a short walk away from Terminals 2 and 3. Some specific services, but not all, calls at Terminal(s) 4 and/or 5. The Central Bus Station is accessible from Terminal 4 and 5 bus services and tube.

There are opportunities for HAL to enter into commercial agreements with coach operators, for example to open new routes between the airport and areas of interest. There are also opportunities for provision of additional dedicated rail-air coach links between railway stations and the airport.

HEATHROW FREE TRAVEL ZONE



Local buses

Due to the location of Heathrow within the TfL Zone (on its western border), local bus services are variable depending on whether they originate within the GLA or a neighbouring local authority area. there is an opportunity for Heathrow Airport to enter into a commercial agreement with TfL or other authorities to deliver additional bus services to and from Heathrow but by their nature, the scope of increased bus provision to improve access to the airport will be limited, particularly further out.

Conclusion

While alternative options to WRLtH are available and we recognise advantages to some of these alternatives, WRLtH remains the preferred solution to meet the strategic aims as defined. It is recognised that further assessment of these options is required.

The impact of alternative solutions are either: uncertain; dependent on third parties; constrained by technical limitations such as the availability of sites; highly dependent on other solutions to be deployed in parallel to be effective; or would deliver undesirable effects.

Conclusions of Strategic Case

There is a strong strategic argument for WRLtH, and it is recommended that the project is progressed to OBC. The HRA programme sets out six strategic aims, and analysis indicates that WRLtH is in a strong position to meet these aims. While other options have been considered and may also contribute to meeting these aims, WRLtH is the preferred option and will have the greatest impact to the west of the UK.

Connect communities

The WRLtH connects the west of the UK to Heathrow, and offers a reduced journey time to large parts of the UK including Scotland and Cornwall. It would provide improved generalised journey times from Reading to Heathrow and competes well with other modes of transport and rail alternatives. It would offer an approximate 30 minute journey time saving compared with travelling via OOC or Paddington for passengers from the west of the UK.

The WRLtH would improve connectivity from the west and would provide greater choice of surface access options for travelling to Heathrow in areas where there is high demand and low public transport mode share. In a two runway scenario there are assumed to be 52 million passengers requiring surface access in 2024. It is forecast that of those, 12% would travel from areas neighbouring Heathrow to the west (the Western Wedge). Without improved connections, only 3% of these passengers are forecast to use rail to reach Heathrow due to poor public transport connectivity, this would improve with the WRLtH and would see railmode share increase to 9%.

Reduce road congestion and encourage modal shift

The WRLtH would provide a regular service to encourage air passengers and airport employees travelling to and from Heathrow to transfer from cars to rail, contributing to reduced road congestion.

It is estimated that WRLtH would support 1.30 million fewer Heathrow passenger journeys accessing Heathrow by road modes (car, taxi, bus and coach) in 2024. This represents a reduction in Heathrow passenger road journeys of 3%.

Evidence also suggests it will release capacity at Paddington, OOC and on the Piccadilly Line, offering crowding relief to those travelling from London and the East.

Boost economic growth and encourage regeneration

The enhanced public transport connectivity to Heathrow provided by the link would encourage firms to invest, create jobs and increase economic output at Heathrow, in the Thames Valley and nationally.

The link would also create short term jobs during its construction and longer term employment during its operation and maintenance.

Reduced congestion on the surrounding road network could improve road travel times, also increasing local area productivity.

Support UK Aviation

Even with 2 runways, Heathrow is the UK's main international hub. The WRLtH would support an integrated transport strategy, with improved connections between aviation and rail supporting the competitive position and growth of Heathrow. The SOBC was developed with a 2 runway airport as the base case.

WRLtH will account for 12% of total rail demand to Heathrow, offering an important service to support UK aviation growth. The link will gain further importance with 3 runways and contribute to the growth of the aviation sector and its mode share targets.

Reduce environmental impacts

The WRLtH would reduce reliance on private vehicle and taxi in key markets to the west of Heathrow to deliver net air quality, noise and greenhouse gas benefits as users transfer from diesel and petrol car to sustainable transport modes. The analysis in line with HMT Green Book Guidance indicates that the reduction in road use and congestion would result in approximately £33.1 million of benefits to society over the 60 years appraisal period (PV, 2010 discounted prices) arising from prevention of road accidents and casualties. Shifting to a more sustainable and environmentally friendly mode of transport would provide a reduction in road vehicle emissions equating to an additional £14.4 million.

Be deliverable, affordable and VfM

The WRLtH scheme is well developed and has support from many LEPs and councils and has reasonable certainty in terms of deliverability ahead of Heathrow expansion.

Analysis indicates it will have a positive net revenue contribution over a 60-year appraisal period in both two runway and three runway scenarios.

3. Economic Case

This socioeconomic appraisal has been prepared by NR to identify the benefits and costs of the proposed WRLtH scheme. The project objectives are as described in the strategic case.

The purpose of this appraisal is both to advise DfT on whether it should commit funding to further develop the project and to compare the VfM of different options.

The following is an assessment of the economic case as proportionate to the scheme's current stage of development.

Base Case (Do Minimum)

The base case is the current situation (i.e. the timetable as at December 2017) plus any committed schemes and their associated service specification. The key committed schemes included in the base case are as follows:

- GWML electrification: 2019 GWML timetable changes which give faster journey time and higher frequency to London Paddington on most routes. From 2026, all services are assumed to call at OOC, enabling airport passengers to interchange at OOC.
- Crossrail: Crossrail services on the GWML route to central London (assumed 4tph from Abbey Wood to Heathrow Terminal 4 via Heathrow Central Terminal Area). These services are assumed to call at OOC in 2026. These replace the current Heathrow Connect services. It should be noted that since the SOBC this has been agreed as a 6 tph service with 2tph calling at Heathrow T5. Heathrow, the DfT, TfL and Network Rail are also conducting a joint feasibility study into increasing the frequency of the Elizabeth line service to 8 trains an hour by the mid-2020s
- HEx: assumed to continue to operate at 4tph between London Paddington and Heathrow T5, and to call at OOC from 2026.
- High Speed Two: Phase 1 assumed to open in 2026, Phase 2a in 2027 and Phase 2b in 2033.
- New trains and capacity improvement on the Piccadilly line.

WRLtH service options (Do Something)

The central case, referred to as 'Through 2R', assumes the following:

- Through service of 4tph to London Paddington via Heathrow Airport: Reading to Heathrow Airport T5, calling at Slough, and Twyford and Maidenhead alternately. Services continue to the Heathrow Central Terminal Area and London Paddington. In the appraisal, these services are assumed to be an extension of the existing HEx services, and to call at OOC;
- 2 runway demand scenario at Heathrow Airport; and
- Aviation passenger's value of time for business travel (provided by the DfT), and WebTAG values of time for commute and other journey purposes.

The central case is tested against the base case as described above. Two variations to the central case, 'Through 3R' and 'Shuttle 2R' are also assessed in this appraisal. They are:

- Through 3R: as Through 2R, except with a three runway demand scenario at Heathrow airport. At the time of modelling a conservative date of 2028 was assumed for the third runway to commence operations.
- Shuttle 2R: as Through 2R, except WRLtH services operate as a shuttle between Reading and Heathrow T5. WRLtH services do not continue to other Heathrow terminals or to London Paddington. Passengers travelling to the Central Terminal Area would need to interchange at T5 to connect to other terminals.

Demand Forecasting

The number of airport passengers and airport employees predicted to use WRLtH is estimated using logit models owned and operated by HAL, namely the London Airports Surface Access Model (LASAM) and Heathrow Employees Surface Access Model (HESAM). These are mode share models and predict how air passengers and employees will travel to the airport in the future under different airport development scenarios. The models use a logit type probability formulation that relates the proportion of air passengers choosing a particular mode to the characteristics of the mode in question and all competing modes. They contain extensive 2009 survey data from the CAA, and their large geographical coverage enables the production of demand forecasts by mode, segment, geography, time of the day and terminal. They also include survey data of airport employees. Updated passenger and employee forecasts based on more recent surveys will be used and further tested at OBC.

LASAM assumes the implementation of WRLtH does not affect airport choice i.e. it does not increase the total number of passengers choosing to fly to and from Heathrow Airport. HESAM assumes fixed land use and no redistribution of employees. In unconstrained demand situations, these assumptions would tend to produce conservative demand estimates. In this situation, however, demand for travel to Heathrow airport is constrained by the forecasts for flight demand, and these in turn are constrained by the available capacity, rather than by existing land use patterns or the relative attractiveness of Heathrow to other airports.

The demand models were run to create forecasts for years 2021 and 2035. The 2021 forecasts were then grown to 2027 forecasts by using the compound annual growth rates (CAGR) between the 2021 and 2035 forecasts. In this appraisal the WRLtH is assumed to open in 2027. The LASAM model also takes into account the impact of the opening of OOC in 2026 on WRLtH demand. The model estimates the effect of GWML rail passengers having the choices to interchange at OOC for access to Crossrail and Heathrow Express services to Heathrow Airport. This is considered both in the base and option scenarios in 2035, and hence reflected in the all appraisal years via the calculated CAGR.

Heathrow Airport passenger demand forecasts

The models assess WRLtH in the context of two and three runways at Heathrow and assume in both that demand for WRLtH is constrained by the airport capacity. The airport passenger demand forecasts are shown in Figure 1.

	2011	2030	2040
Two runways	70m	85m	90m
Three runways	70m	104m	130m

FIGURE 1: HEATHROW AIRPORT DEMAND FORECAST SCENARIOS

These forecasts are from the Airports Commission's 'Strategic Fit: Forecasts' report of November 2014 and reflect a view of future airport demand as at the time of the demand forecasting work.

Note that the DfT have produced a more recent view of Heathrow airport demand in the 'UK Aviation Forecasts: Moving Britain Ahead' report of October 2017. Both scenarios assume no runway expansion at Gatwick Airport. Figure 2 compares the two sets of forecasts.

	2011	2030	2040
Two runways - AC	70m	85m	90m
Two runways - DfT	-	86m	90m
Difference		*+1%*	*+0%*
Three runways - AC	70m	104m	130m
Three runways - DfT	-	132m	135m
Difference		*+27%*	*+4%*

FIGURE 2: COMPARISON OF HEATHROW AIRPORT DEMAND FORECASTS

The DfT and Airports Commission forecasts for the two runway scenario are very similar. However, the DfT forecasts demonstrate more front-ended growth than the Airports Commission forecasts in the three runway scenario. The use of the DfT forecasts in the appraisal of this scheme would be expected to have a positive impact on the VfM of the three runway option.

Note that all the forecasts discussed in this section capture non-transfer passengers, airport employees, and any other surface access users.

Economic Case Benefits Analysis

Journey time benefits to rail passengers

WRLtH increases rail competitiveness by reducing the rail travel time to Heathrow from the West, resulting in a time saving for existing rail passengers and encouraging modal shift from other modes. The appraisal captures the mode shift journey time benefits to rail passengers as a result of the WRLtH scheme. The WRLtH scheme is assumed not to affect the overall market size (i.e. does not induce demand), because overall demand to Heathrow airport is fixed at the Airports Commission forecasts.

Value of time analysis seeks to understand how generalised journey time improvements will be perceived by business, leisure and commuting passengers in monetary value. The analysis recognises a passenger's journey not only includes in-vehicle time, but also accounts for interchanges and service frequency. This journey time is referred to as Generalised Journey Time (GJT). Penalties in the form of additional minutes are applied dependent on the frequency of the service and number of interchanges consistent with guidance from the Passenger Demand Forecast Handbook.

Rail generalised journey times

In the appraisal, WRLtH's GJT from Reading/Slough is compared against a rail journey from Reading/Slough into London Paddington for interchange to HEx or Crossrail services to Heathrow airport. Figures 3 and 4 compare the GJTs for the base case to GJTs for WRLtH through services (the central case) for each option, before and after the opening of OOC station. When OOC station opens, the GJT in the base case decreases. This is because passengers from the west could interchange between mainline and airport services without going all the way into London

Paddington. Generalised journey times are different in these years because OOC is assumed to open in 2026 for GWML passengers to have access to Crossrail and Hex in both the do minimum and option scenarios.

GJT to Heathrow T5 from Reading (mins)	Before OOC	After OOC
Without WRLtH services	88	85
With WRLtH through services	41	41

FIGURE 3: COMPARATIVE GJTS TO HEATHROW T5

GJT to Heathrow CTA from Reading (mins)	Before OOC	After OOC
Without WRLtH services	82	79
With WRLtH through services	46	46

FIGURE 4: COMPARATIVE GJTS TO HEATHROW CTA

Values of time

All options use the WebTAG November 2016 values of time for leisure and commuting trips, and a custom weighted aviation value of time for business users. The business user values of time are derived from passenger purpose shares from a 2016 CAA passenger interview survey at Heathrow Airport, and from Heathrow air passenger appraisal values of time, as provided by the DfT for use in this appraisal. Business values of time were provided for four categories of business passenger: UK resident on business within the UK, UK resident on business internationally, foreign resident on business within the UK, and foreign resident on business internationally. The CAA survey provided the proportion of all business trips that fell within each category, which was used for weighting.

The values of time used in the appraisal of rail journey time benefits are shown in Figure 5. They are shown as values of time per hour by journey purpose in 2010 prices and values.

Journey Purpose	Value of Time per hour
Commuting	£9.95
Leisure	£4.54
Business	£44.62

FIGURE 5: VALUES OF TIME BY JOURNEY PURPOSE

Summary of rail journey time benefits

Figure 6 summarises the total value of time saving in each option, in 2010 market prices and discounted to 2010 values, for selected years throughout the 60 year appraisal period. The WRLtH services are expected to generate more benefits under the 3 runway scenario due to increased Heathrow passenger demand.

	2027	2028	2048
Through 2R	£23,568,000	£27,368,000	£50,840,000
Through 3R	£23,568,000	£35,109,000	£66,655,000

Shuttle 2R	£12,651,000	£14,276,000	£20,493,000

FIGURE 6: TOTAL VALUE OF TIME SAVING IN SELECTED YEARS

Non-user benefits

The calculation of non-rail user benefits is based on the calculation of miles removed from the road network, as per the marginal external costs section in WebTAG. It captures the environmental benefits, including the reduction in noise, road congestion, and air pollution, from a modal shift from road to rail when the rail offering is improved. A significant proportion of the benefits of this scheme are due to the reduction in road congestion as a result of modal shift from road to rail.

One of the outputs from the LASAM model is an origin-destination demand matrix showing the transport modes that WRLtH journeys are predicted to abstract from. From this data, and using the vehicle occupancy assumptions shown in Figure 7, the road mileage reduction resulting from modal shift from road to rail was calculated.

Sub-mode and journey purpose	Occupancy rate	Source
Business - Park and Fly	1.14	As advised by DfT, derived from 2011-2013 CAA surveys, weighted by UK/foreign
Business - Kiss and Fly	1.16	
Business - Taxi	1.27	
Leisure - Park and Fly	2.14	
Leisure - Kiss and Fly	1.61	
Leisure - Taxi	2.06	
All - Bus/Coach	12.20	WebTAG

FIGURE 7: VEHICLE OCCUPANCY ASSUMPTIONS

The benefits associated with this reduction in road miles were monetised using Marginal External Cost of Car Use. These values are weighted by the proportion of road trips originating in each region to account for varied regional values.

Figure 8 summarises the value of non-user benefits for each option, in 2010 prices and discounted to 2010 values, for selected years throughout the appraisal period. For option Through 2R, WRLtH through services are estimated to generate £5.1 million (in 2010 prices) of non-user benefits in 2027, which is higher than the shuttle services. Over the whole 60 year appraisal period, the WRLtH through services are expected to generate more benefits under the three runway demand scenario at Heathrow, as demand is expected to be higher. Therefore option Through 3R has the highest total non-user benefits.

	2027	2028	2048
Through 2R	£5,102,000	£5,776,000	£5,978,000
Through 3R	£5,102,000	£7,090,000	£8,133,000
Shuttle 2R	£3,725,000	£4,217,000	£4,365,000

FIGURE 8: TOTAL NON-USER BENEFITS BY OPTION, SELECTED YEARS

Economic Case Costs Analysis

Capital Costs

The final cost estimate of the scheme will be finalised when the design is completed. Capital costs are expected to be in the region of £1bn.

This is based on a GRIP 2 + level of design where some elements such as tunnel design are at GRIP 3 AiP and other elements are at GRIP 2 level. To reflect this stage of scheme design an optimism bias of 50% was included as part of our assessment, this recognised the reasonable level of uncertainty on final scheme costs given the complexity of the project's interfaces.

The capital cost spend profile used as part of our assessment is shown in Figure 9. The spend profile is based on an early view of the construction programme and it will be further refined as part of the Requirements Review and completion of the constructability report following design freeze after statutory consultation.

Year	Cost spend profile - all options
2018	2%
2019	3%
2020	7%
2021	13%
2022	14%
2023	14%
2024	15%
2025	16%
2026	16%

FIGURE 9: COST SPEND PROFILE

Renewal Costs

This appraisal assumed that a one-off renewal of some infrastructure will be required 30 years after opening. A whole life cost study is not yet available, so the current estimated renewal figure is based on a typical major infrastructure scheme. The modelled estimate is that 15% of the initial capital cost would be incurred after 30 years as a one-off renewal.

An assessment of the current cost estimate shows that approximately 10% of the capital cost is directly related to track, signal and power overheads. Another 40% is mainly civil and structures (e.g. tunnel and bridges) which are not expected to be renewed within the appraisal period. With management fees and other costs, a 15% estimate is considered reasonable at this stage.

For this analysis a GRIP 2 optimism bias of 50% has been applied to the renewals capital cost used in the appraisal, as per guidance at the time of appraisal.

Operating Costs

The appraisal also included the following operating costs:

- **Vehicle leasing costs** – the costs required to hire additional rolling stock to operate the service proposition. This is driven by an estimated diagram requirement.

- **Vehicle maintenance costs** – the costs of maintaining the additional leased vehicles. This is driven by estimated diagram requirements and estimated train miles run.
- **Electric Variable Track Access Charges (VTAC)** – this is driven by estimated train miles run.
- **Electricity Charge for Traction (EC4T)** – the cost of the energy consumption of the electric trains. This is driven by estimated train miles run.
- **Employment costs** – the cost of employing the drivers and train managers required to operate the additional services. This is driven by an estimated diagram requirement. Each diagram is assumed to require three drivers and three train managers to operate.

It should be noted that the appraisal assumed that the scheme does not result in any change to existing station operating costs. It was not considered proportionate to appraise any further operational costs at this stage of development.

For this analysis a GRIP 2 optimism bias of 1.6% has been applied to the operational costs used in the appraisal (WebTAG Unit A5-3, table 3).

Diagram Requirements

A diagramming exercise was completed to estimate the number of additional diagrams required to operate WRLtH services. The exact rolling stock type to be deployed is not yet confirmed therefore this appraisal has assumed the cost of a typical Electric Multiple Unit, based on generic NR operational cost assumptions that were originally agreed for use in Route Study appraisals. They are used in the absence of information specific to the rolling stock to be used on the WRLtH project. When the scheme is developed further, TOC and rolling stock specific leasing cost should be used.

Through services

At SOBC the through services are assumed to be extensions of the existing HExservices. It is estimated that a total of nine diagrams are required to operate WRLtH services from Reading to London Paddington via Heathrow. The current diagram requirement of the HEx services is estimated to be five diagrams. The appraisal assumes that an increment of four diagrams is needed to operate WRLtH through services: two of these diagrams are assumed to be in nine-car formation and the other two in five-car formation, to match the range of formations currently run by HEx services.

Shuttle services

The shuttle services are assumed to operate independently. An estimated five diagrams are required to operate the daily shuttle of WRLtH services between Reading and Heathrow airport. All services are assumed to operate in five-car formation.

Estimated Train Miles

An estimate of daily train miles operated by WRLtH services was calculated, and drives vehicle maintenance costs, VTAC costs, and EC4T costs.

This estimate is based on the following assumptions:

- Rail distance of 31 miles between Reading and Heathrow T5
- Frequency of four tph in both directions
- Services operate for 18 hours per day

- No allowance for empty coaching stock moves

For through services, the estimate includes only the miles run between Reading and Heathrow T5, because these services are assumed to be extensions of the existing HEx services. The miles run between Heathrow T5 and London Paddington are thus not included in this estimate.

For all options in this report, an estimated additional 4,464 train miles per day are operated by WRLtH services.

Appraisal Results

An economic appraisal was carried out in accordance with DfT's appraisal guidance. The main benefits are the journey time benefits and non-user benefits to road users. Aviation value of time is used for business users.

A summary of the appraisal results for each option is shown in Figure 10. A breakdown of the cost and benefit results for each option is shown in Figure 11.

	Through 2R	**Through 3R**	**Shuttle 2R**
VfM Category	Medium	High	Poor
Total Net Present Benefits	£843m	£1130m	£386m

FIGURE 10: SUMMARY OF APPRAISAL RESULTS

- The central option, Through 2R, represents a medium VfM business case. It has Net Present Benefits (NPB) of £843m over 60 years. The VfM of this option is improved in a three runway demand scenario at Heathrow airport. The through service option represents better VfM than the shuttle service option.

Results of socio-economic appraisal	**Through 2R**	**Through 3R**	**Shuttle 2R**
Net benefits to consumers and private sector	£m PV	£m PV	£m PV
Rail user journey time benefits	712	928	297
Non-user benefits - road decongestion	262	351	191
Non-user benefits – noise, air quality, greenhouse gases & accident benefits	46	62	34
Rail user and non user disruption disbenefits during possessions	-37	-37	-37
Indirect taxation impact on government	-140	-174	-99
Total	843	1130	386

FIGURE 11: APPRAISAL RESULTS FOR ALL OPTIONS

The most significant stream of benefits is journey time benefits to rail users, followed by road decongestion benefits to non-users. Other non-user benefits have a small positive impact, while disbenefits during construction and the indirect tax impact reduce benefits (by approximately 10% in the Through 2R option).

The benefits for the Shuttle 2R option are notably lower than for the Through 2R option. The journey time benefits to rail users are more than halved when WRLtH services operate as a shuttle rather than continuing through to the central terminal area and on to London Paddington. Non-user benefits are reduced by more than 25% compared to option Through 2R, reflecting fewer miles removed from the road due to lower rail demand and less abstraction; WRLtH shuttle services are less attractive than WRLtH through services.

Key Risks, Sensitivities and Uncertainties

The central case has been tested against a base case. This base case is the current situation (i.e. the timetable as of December 2017) plus any committed schemes and their associated service specification (e.g. GWML electrification, Crossrail introduction, HS2 and Piccadilly Line extension).

The following sensitivities were tested for the 'Through 2R' central case:

- **Fare increase sensitivity:** a sensitivity test on the fare assumptions was carried out. This sensitivity test assumed that WRLtH fares for all journey purposes (i.e. for both airport passengers and airport employees) were 50% higher than in the central Through 2R case. This saw the scheme move from medium to low VfM.
- **Capex optimism bias sensitivities:** the central case options include optimism bias of 50% on capital costs. Two sensitivities were taken which varied the levels of optimism bias (optimism bias and GRIP 2 and GRIP 3 differentiated optimism bias with QRA) on capital costs, both of these were tested and resulted in being medium VfM.

These sensitivities and variations were chosen due to the range of complex uncertainties that the WRLtH Project is currently managing. The complex and quickly changing environment surrounding the Project has led to difficulty setting a baseline. In the absence of a stable baseline a number of assumptions have been made, both positive and negative, to enable the development of the SOBC.

We will continue to work through these assumptions to ensure that potential benefits are maximised and scheme costs are reduced in advance of OBC, which will in turn strengthen the Economic Case.

4. Financial Case

Current Funding Commitments

DfT's historic and current commitments to fund the scheme are detailed below:

(a) **2012 HLOS.** It was originally included in the 2012 HLOS. At the time, the Secretary of State reported, *'The Government wishes to see a new railway link to give western rail access to Heathrow Airport' but did not commit to the scheme, making it 'subject to a satisfactory business case and the agreement of acceptable terms with the Heathrow aviation industry'.* Up to £500m funding was committed as part of the PR13 (CP5) Determination.

(b) **Hendy Review**. However, as part of the Hendy Review (2015), a strategic reprogramming of certain enhancements, the project was deferred, with a plan to deliver it in CP6.

(c) **2017 SoFA.** The commitment to fund the project was then reconfirmed in 2017, "*Government has already made clear that it expects new enhancements to the rail network to be developed outside of the regulatory system. However, the [Statement of Funds Available] SoFA published today includes funding to continue to take forward the enhancements that were deferred from control period 5".* (Written statement by the Secretary of State to Parliament, 12 Oct 2017). This includes the Project, but this statement is not interpreted as a formal funding commitment.

(d) **Current position**. Development funding has been made available by the Department to develop the OBC and enable NR to progress the scheme towards a DCO application. Earlier this year, the Secretary of State reaffirmed his support for the scheme to the Transport Select Committee and reiterated his expectation that there would be a form of contribution from HAL toward the scheme (Oral evidence: Airports National Policy Statement, Transport Select Committee, 7 February 2018).

Budget Arrangements

The required funding is managed through the joint NR and DfT governance arrangement set out in the enhancements Memorandum of Understanding. In this case, that will be through the HRA Programme Board and Enhancement Portfolio Board.

Changes to spend profiles or forecast costs will be governed through the joint change control process with impacts on the overall enhancement portfolio spending considered as part of this process.

Investment decisions on the Project are made by the Department's Rail Investment Board (RIB) and BICC.

Opportunities

DfT and NR are conducting a Requirements Review to identify opportunities to reduce costs whilst maintaining the specified outputs. For example, analysing whether four shafts are required in the tunnelled section and if the alignment between Heathrow T5 and Langley can be improved to be more efficient.

Risks

The key financial risk to the project at this early stage is that its deliver proves unaffordable to Government. As explained below a Market Engagement exercise is being undertaken to consider the potential for third party investment to mitigate this risk. Developing an understanding of the benefits and associated risks of private finance in advance of OBC will be key.

This will be supported by ongoing efforts to maximise the overall scheme Business Case through work to reduce the Anticipated Final Cost, maximise benefits accruing through service proposition and work to agree a contribution with the Heathrow aviation industry.

There is the potential for an Investment Recovery Charge (IRC) to be levied on the infrastructure. This will be further investigated at OBC alongside other sources of funding. Where the IRC is determined to be levied this would be in the context of the scheme potentially not being able to proceed without such charge being levied

Funding Arrangements

The Programme team in DfT has admin and programme funding for interim staff and external consultants to support the delivery of the programme and the assurance requirements. This DfT funding has been bid for and allocated to the Network Services HRA team and is subject to the normal Departmental rules on authorising expenditure and corporate planning routes.

Accounting and Budgetary Issues

WRLtH is currently part of the overall rail enhancements portfolio and cost pressures on the overall portfolio are not considered as part of this Business Case. Decisions on affordability will be taken in the context of the RNEP and through the joint NR and DfT Network Portfolio Board.

Regularity and Propriety Issues

The Government's approach to funding for surface access improvements is set out in the 2013 APF and the Secretary of State's ability to fund surface access improvements is constrained by the laws prohibiting or restricting State aid.

In line with the 2013 APF, and the ANPS, where a surface transport scheme is not solely required to deliver airport capacity and has a wider range of beneficiaries, the Government, along with relevant stakeholders, will consider the need for a public funding contribution alongside an appropriate contribution from the airport on a case by case basis.

The CAA and The Office of Rail and Road (ORR) will need to be consulted as relevant regulatory bodies, particularly in regard to agreeing an acceptable level of funding with HAL.

Market Engagement

In line with HMT Green Book guidance, a range of options for financing will be considered for WRLtH to ensure best VfM is delivered to passengers and taxpayers, as well as allocating risk to the organisation best placed to manage it, whether in the public or private sector.

The Shaw Report and the Hansford Review have made recommendations to Government and NR to harness third party funding and financing of railway enhancements in order to broaden sources of

investment and support innovation and growth. Government, and NR through its 'Open for Business' work, have signalled a strong desire to bring a pipeline of projects to market to commence this process of third party involvement where practical. The market has indicated at various times that it has significant capacity available to support suitable projects.

WRLtH is the first such potential opportunity to be offered to the market for consideration. Involvement of the private sector could free up resources and capacity for other network enhancements, which may otherwise be capital constrained or developed on a slower timeline.

To support the development of an OBC for the scheme a series of market sounding sessions are being undertaken with financial and industry participants to assess market appetite in respect of third party investment and contracting participation in the WRLtH project. This Market Engagement will be a key determinant in the future direction of the WRLtH project and will help inform how it is funded and delivered as it progresses through the Rail Network Enhancements Pipeline.

5. Commercial Case

Key Outputs/Deliverables

The key output driver for this Project is to improve access to Heathrow Airport for both business, leisure travellers and the airport workforce, by improving rail connectivity to the airport from the immediate vicinity, the M4 corridor, the wider Thames Valley, the West of England, the South West, South Wales and the West Midlands.

The key deliverable required from NR at this stage of the Project is to develop options to provide a westerly rail route to achieve optimum journey times between Reading and London Heathrow Airport, calling at Slough and Maidenhead or Twyford, at a maximum frequency of 4 tph. Funding has been provided to NR to enable the continued development of the Business Case, and achievement of planning consents for the WRLtH Project.

Capability and Skills

At the SOBC stage the viability of the proposal is assessed by reviewing the ability of either the market or NR internally to deliver the required outputs.

The WRLtH team has the range of necessary skills required to perform the clienting function for this stage of scheme development, albeit within a small project team, but is able to draw on significant broader experience from within the Department. This includes:

- vital day to day support from the Airport Capacity Directorate;
- legal expertise;
- commercial expertise both from DfT Corporate Finance Directorate and external advisors; and
- knowledge of the Great Western franchise from the relevant DfT Passenger Services team and of the Crossrail project form the DfT Crossrail Sponsorship team.

In addition, NR, who are the technical interface and the assumed ultimate procuring authority, will need sufficient resource to deliver the scheme. NR already has a multidisciplinary team working on the Project, with extensive experience of operations on the GWML and delivering railway enhancements.

Given the ongoing uncertainties around the funding and delivery models that will be used, future resourcing requirements cannot yet be defined. For example, if a third party approach is progressed, further resource, including specialist legal advice will be required to support both NR and the Department.

Procurement Strategy

The final procurement strategy for project implementation has yet to be developed.

As set out in the Financial Case the Department and NR are working to explore recommendations from the Shaw Report and Hansford Review on harnessing third party funding and financing of railway enhancements. The utilisation of an alternative funding or financing model would significantly affect the delivery mechanism and associated procurement strategy for the Project.

Key issues that will be considered as part of the Market Engagement and used to inform the development of the OBC include: risk assumptions; gearing; payment mechanisms and financial structure.

Alongside the Market Engagement exercise that the Department is undertaking to support the development of the scheme OBC, the key next steps include:

- contractor engagement to prove concept, develop commercial models and confirm timelines;
- refining the risk register for private finance, and introducing a delivery register;
- as necessary, agreeing affordability constraints on an annual basis between the Department and NR - and then creating a payment mechanism that meets those constraints;
- integrating the findings of the Market Engagement; and
- refining VfM appraisal and confirming balance sheet treatment.

Contract management

The contract management strategy for the overall project has yet to be developed and greater clarity of the proposed funding and deliver models is required before this can be undertaken.

NR has put a Sponsor team in place to ensure that the works by NR's Infrastructure Projects deliver maximum value to the Client.

Should a 'conventional' procurement approach be undertaken the NR Sponsor team will deliver the required enhancements through NR Infrastructure Projects and through further contractual arrangements as required.

Risk allocation and transfer

Should a 'conventional' procurement approach be pursue NR will seek to transfer technical and delivery risks to its contractors where possible, incentivising contracts to minimise cost, schedule and quality risks.

Should we pursue an alternative funding or financing model, effective risk allocation will be vital to deliver a VfM case.

VfM is secured by allocating appropriate risk to the private sector under best value terms and recognises where risk should be retained by NR and/or the Department. Effective risk allocation is a crucial determinant of establishing VfM of a Private Finance transaction. This will be explored in detail at OBC.

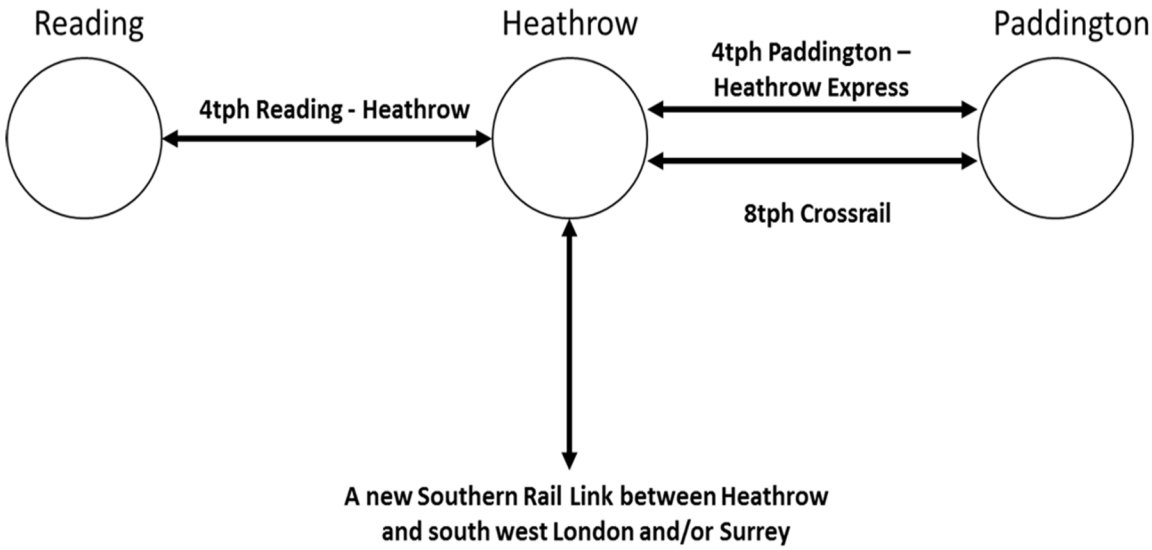
Going forward, and to be tested as part of the Market Engagement activity, we are clear that the procurement structure will need to make sure the level of risk transfer is proportionate to achieve VfM.

6. Management Case

HRA Programme

In order to manage the dependencies and relationship between WRLtH and the proposed SRLtH the HRA Programme was established.

The scope and aspiration of the HRA Programme is shown diagrammatically below. It encompasses the aspiration to provide new Western and Southern Rail Links to the airport whilst maintaining a baseline of 4 tph HEx and 6 tph Crossrail services and alongside a potential further enhancement to Crossrail provision (an additional 2 tph).



Although it is assumed that delivery of SRLtH would be after the delivery of WRLtH, it is recognised that taking a holistic approach to their development is critical to ensuring the system-wide operation of Heathrow as a 'hub' and in delivering feasible, affordable and VfM proposals.

The key challenge to this approach is the relative immaturity of SRLtH and the requirement for further validation and feasibility work on the scheme proposals to be completed. Therefore, a key requirement from the Department of the WRLtH Project is that the infrastructure required to deliver WRLtH, takes into account and does not preclude the future delivery of a southern access scheme.

Looking forward, the key upcoming WRLtH Project milestones and deliverables are summarised in the table below:

Milestone / Deliverable	Target Date
Industry 1 to 1 Engagement meetings	June – July 2018
Post Consultation Design Freeze	July 2018
Phase 2 of Market Engagement for WRLtH OBC Finalisation	September – October 2018

Outline Business Case Complete	February 2019
DCO Application Submission	June 2019
DCO Application Decision	November 2020

Project Dependencies

In developing proposals for improved rail access to Heathrow Airport the WRLtH Project interacts with multiple infrastructure owners, two regulators and regulatory regimes and a number of train operators with different franchise structures and is situated within the Thames Valley, an area seeing a significant amount of infrastructure investment. The successful management of a challenging number of complex dependencies will be critical if the WRLtH Project benefits are to be fully realised

Other key Project dependencies include:

Dependency	Scale	Description
Crossrail	Major	Crossrail will deliver electrification and station alterations along the GWML from Heathrow Airport Junction to Maidenhead (inclusive) which will provide the electrification infrastructure that WRLtH will connect to. It also forms part of the baseline of services assumed to be operating prior to the introduction of WRLtH.
Heathrow Airport Expansion	Major	If progressed, it is anticipated that the WRLtH DCO application will precede any application for a Heathrow third runway, but both planning applications will overlap and therefore scheme designs will need to be compatible at the point of submission. If taken forward, it is also expected that the third runway would be delivered at the same time as WRLtH construction and so there will need to be close interaction between the two to ensure the designs and construction programmes remain compatible. Ongoing coordination and management of the cumulative impacts of the major projects underway in the Thames Valley area will also be required.
CEMEX	Medium	Construction materials company CEMEX are going to be working in the same area as WRLtH during construction. NR are currently exploring opportunities which may become available as a result of this and are looking at how impact to local communities of both projects can be minimised.
Great Western Railway Franchise Competition	Medium	Current Great Western Railway franchise is due to expire in April 2019, with an option to extend to April 2020. Significant engagement with the franchisee will be required as the service proposition for WRLtH is developed, including in any decisions on future operator, and when agreeing a construction programme.

The WRLtH Project SOBC has been produced having taken into consideration the various dependencies listed above, from both a delivery and operational perspective, as well as ensuring alignment with the Western Route Study, Southwest Quadrant Strategy and the wider strategic aims for this region.

Programme/Project Governance, Organisation Structure and Roles

DfT and NR Organisation Structure

DfT provides strategic direction and funding to the railways in England and Wales, as well as awarding and managing rail franchises, and regulating rail fares. The Department's work is directed and overseen by the Secretary of State for Transport and his Ministerial team.

The Network Services Directorate sits within DfT Rail Group, and is responsible for ensuring that investments in the railway are planned, managed, and delivered in the most efficient and effective way. The Directorate acts as the client and funder for the investment programme into our railways, planning how services and infrastructure will be enhanced to meet future challenges, and supporting local authorities, and other third party funders to secure the necessary approvals to deliver locally funded enhancements to the network.

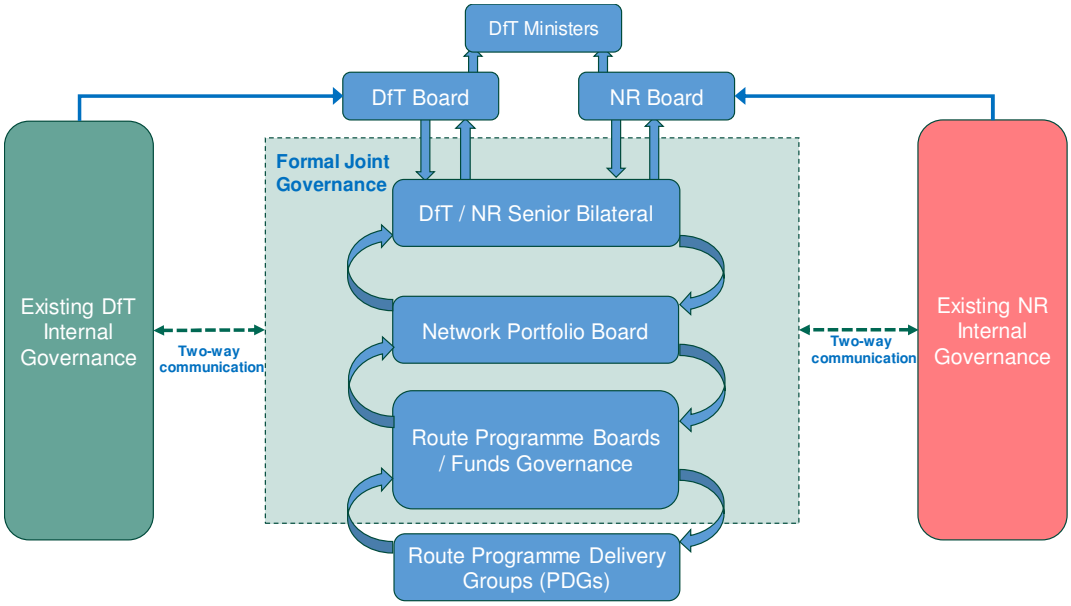
The HRA Programme Team within the Network Services Directorate is tasked with developing the business case for WRLtH, acting as the client and funder for the project and ensuring that it is developed holistically alongside proposals for Southern Access to Heathrow.

DfT work closely with a number of NR teams, including:

- The System Operator: Who provide industry wide coordination of activities required to optimise the overall use of the network for the benefit of all users.
- Infrastructure Projects: Who develop, design and deliver enhancement and other large complex capital projects for routes across the network.
- Route Sponsorship: Who as client for enhancement projects on the route requirements with funders, informs specification and provides oversight on the delivery of enhancements

DfT and NR Governance

As a proposed railway enhancement the WRLtH Project, as part of the HRA Programme, is subject to joint governance between Rail Group and NR in accordance with the Memorandum of Understanding (MOU) that was executed between the parties in 2016. The governance arrangements provide strong controls for the effective management of costs, schedule and scope in order to ensure that the baseline is maintained and the Project outcomes are achieved. The joint governance arrangement is illustrated in the diagram below.



The WRLtH Project is monitored and controlled through the set of Boards indicated in the diagram above with board sub-committees operating or being formed as required to perform specialist functions.

The functions of the joint governance boards are outlined below:

- The **DfT / NR Senior Bilateral** meeting provides senior and strategic direction and escalation for issues beyond portfolio level or outside of set tolerances.
- The **Network Portfolio Board** provides governance and oversight of enhancements portfolio, aligning with UK Government Strategy, optimising benefits within affordability and deliverability constraints.
- The **Programme Board (HRA Programme Board)** provides governance and management of delivery of programme benefits and business case.
- The **Project Delivery Group (WRLtH Client Meeting)** provides working level oversight and management of delivery of required outputs to time, cost and quality.

The WRLtH Client Meeting (Project Delivery Group) consists of stakeholders from the Department, NR and WSP (who provide the Industry Systems Integration function across the HRA Programme) who convene at least once a month. This group is a key forum for the day to day management of the Project and meetings focus on key risks and issues and discuss items requiring escalation to the HRA Programme Board.

The HRA Programme Board has a wide membership to reflect the range of Programme interfaces and dependencies. It meets every two months and is charged with managing the delivery of programme benefits. It is empowered to take key Programme/Project decisions and is used to ensure cross-industry agreement and understanding on material issues affecting the Programme (e.g. changes to the WRLtH project scope).

As set out in the diagram above, decisions that require further authority, such as changes in Enhancement Delivery Plan date changes, are then escalated from the HRA Programme Board to Network Portfolio

As the HRA Programme and WRLtH Project develop their governance arrangements will be kept under active review to ensure they remain fit for purpose.

Communications and Stakeholder Management

A communications plan has been developed between DfT Rail Group and NR which allows communications to be targeted at key stakeholder groups. The guiding principle this sets out is that communications to stakeholder groups will be managed by the organisation that is most closely aligned to the stakeholder group. For example, it is expected that communications with Government stakeholders such as HMT, Cabinet Office and Civil Aviation Authority will be led by DfT Rail Group. NR will lead on communications with route stakeholders such as local authorities, TOCs and Freight Operating Companies.

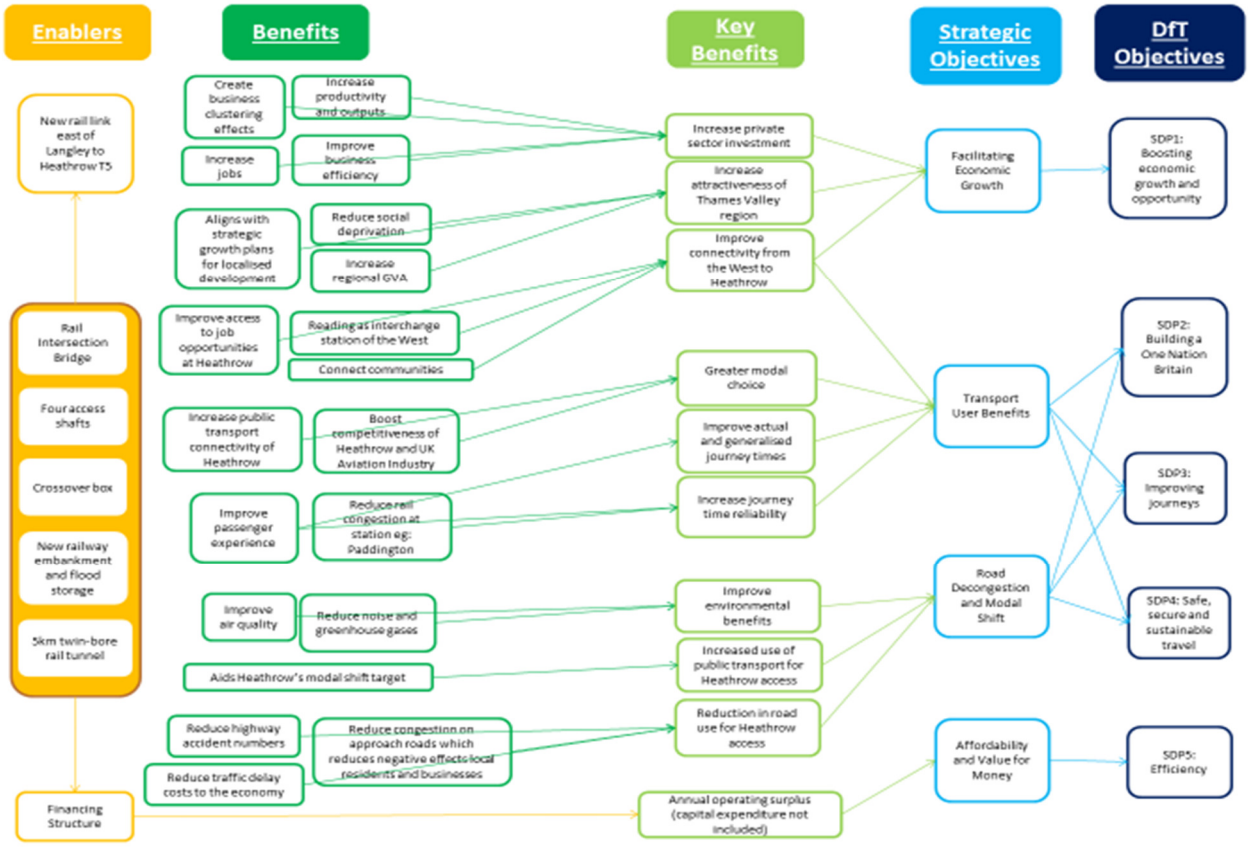
The main objective of the communications and stakeholder engagement activity is to build support and advocacy for improved rail access to Heathrow and to keep stakeholders aware and, where appropriate involved, in any developments to the Programme.

Benefits Management

The realisation of programme benefits is managed in accordance with the benefits management framework that is produced and maintained by the Portfolio Office in Rail Group. The monetised benefits for the WRLtH are further defined in the Economic Case.

Once there is greater certainty around the operator and potential franchisee for WRLtH the HRA Programme Team will liaise with the relevant teams to discuss how the realisation of benefits over the lifetime of the scheme's operation are to be tracked. In addition, some of the Project benefits will be realised by NR. A benefits-focused approach will enable earlier identification of key issues and threats to benefits realisation.

In consultation with key stakeholders, a Benefits Map for the WRLtH Project has been developed. The Benefits Map identifies the relationship between the infrastructure outputs, the benefits and the strategic objectives.



Project Assurance and Evaluation

The WRLtH Project has been designated as a Tier 1 project in the portfolio of Rail Group. As such, the Project is subject to the additional assurance mandated by the Infrastructure Project Authority.

DfT and NR will work to put in place and execute appropriate assurance arrangements for WRLtH, consistent with its corporate polices and in line with the provisions of the DfT/NR MOU.

DfT and NR have worked together to develop an Integrated Assurance Plan (IAP) for the HRA Programme.

The IAP will be regularly reviewed to ensure it remains fit for purpose and will be used to:

- inform the design, management and planning of assurance activities;
- understand the total impact of assurance activities that may affect various elements of the programme so that resource limitations can be avoided; and
- clarify when assurance and approval activities will take place, ensuring preparation activities can be included in project and programme plans.

As a Tier 1 Project WRLtH will be subject to mandatory external assurance and audit activities.

Risks

The Department and NR work collaboratively regarding risk and issue management across the HRA Programme. All parties are responsible for identifying risks and raising them and the Risk Register is a living document which is proactively used to help manage the Programme and is reviewed regularly at both the WRLtH Client Meeting and the HRA Programme Board to inform risk and issues reporting to the wider Department. The HRA Programme Risk Register is aligned with and supported by a more detailed WRLtH Project Risk Register which is owned by NR and used to manage industry level risks to the Project.

Contingency Plan

WRLtH is a railway enhancement scheme and as a result no contingency exists for this investment. The impact of the 'Do Nothing' scenario is outlined in the Strategic Case.