

HSR – SLR

Compare and Contrast

June 2024

Issue 2

Introduction

Context

Arup was appointed as independent adviser to the Heathrow Strategic Planning Group (HSPG) working in partnership with Heathrow Area Transport Forum (HATF) and Heathrow Airport Limited (HAL) to review the proposed development of a connection to Heathrow from the south to improve public transport access.

At a Heathrow Area Transport Forum event in November 2022, various options for this connection were presented by Spelthorne Borough Council, London Borough of Hounslow, and the private Heathrow Southern Rail Limited (HSR) consortium.

The number of scheme options represents a challenge in making a compelling case to government for further consideration of the value such a scheme would present, and what the funding and delivery model might look like.

In the first instance, Arup undertook an independent review of the HSR scheme, a privately funded scheme comprising a heavy rail connection to Heathrow Airport. This review was based on engagement with HSR as well as various stakeholders, including HAL, London Borough of Hounslow, Runnymede Borough Council, Spelthorne Borough Council, Surrey County Council, Network Rail, and Transport for London (TfL).

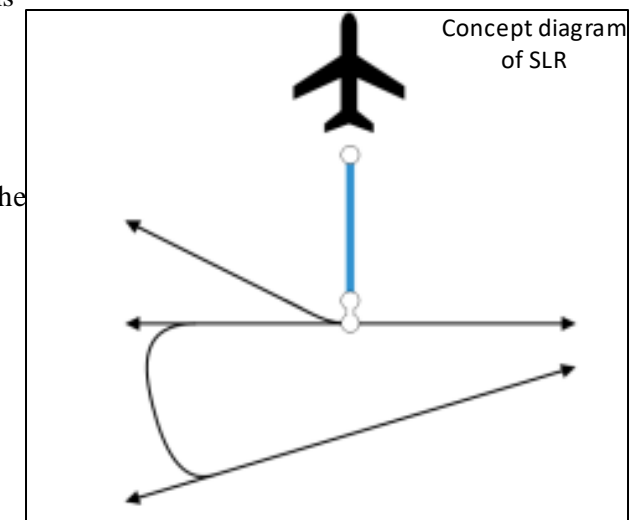
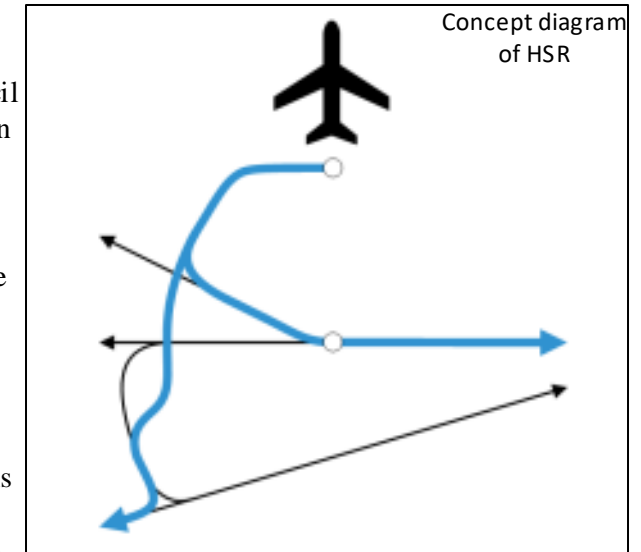
Through this engagement, London Borough of Hounslow, who had previously promoted their own scheme, confirmed that they would now support the HSR scheme subject to further detail on the benefits for Hounslow.

The independent review noted that Spelthorne Borough Council remained in opposition to the scheme and committed to its own proposed light rail scheme (Southern Light Rail – SLR) and recommended HSPG facilitated senior level engagement with Spelthorne Borough Council to explore its opportunities for support of the HSR scheme and to request further details of the proposed light rail scheme so it can be fully and objectively assessed against the HSR scheme.

As a follow up to the independent review of the HSR scheme, Arup was commissioned to undertake a high-level compare-and-contrast exercise between the two schemes. The aim of this exercise is, for a specific list of criteria agreed in consultation with SBC, to understand how the SLR scheme compares to the HSR scheme, for Spelthorne and its residents in particular. This commission does not include for the verification of statements made by other parties and does not constitute a technical due diligence.

As part of the first phase of this work, Arup reviewed a significant quantum of material from the HSR team detailing the feasibility of their proposal. By comparison, the Spelthorne scheme is more concept in nature and has less information available to review and this inevitably limits our ability to understand in depth the benefits and potential problems associated with the proposal.

The wider methodology followed in this commission is set out overleaf.



Introduction

Methodology

Review of HSR & Spelthorne documents and development of comparison framework

- Documents used to create comparison framework (Compare and contrast criteria) but not reviewed for viability
- Framework will entail of list of specific aspects to be compared and reviewed with HSPG prior to engagement
- Comparison of HSR and Spelthorne schemes set out for each Compare and Contrast criteria from available data and information

Engagement with HSR Ltd and Spelthorne BC separately

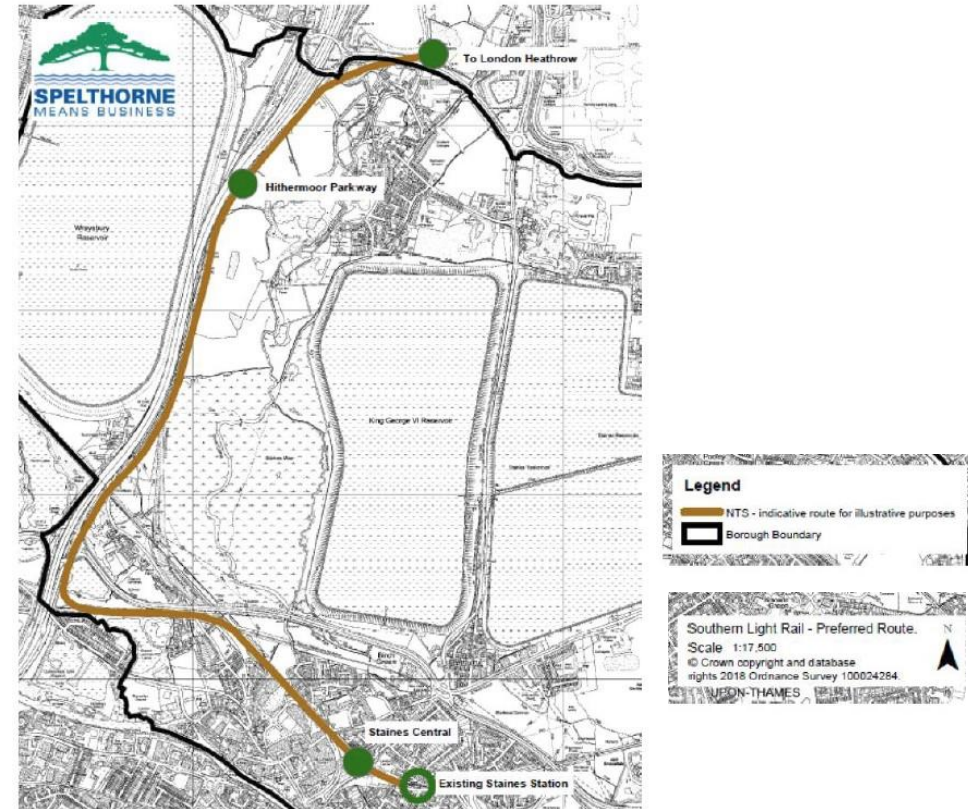
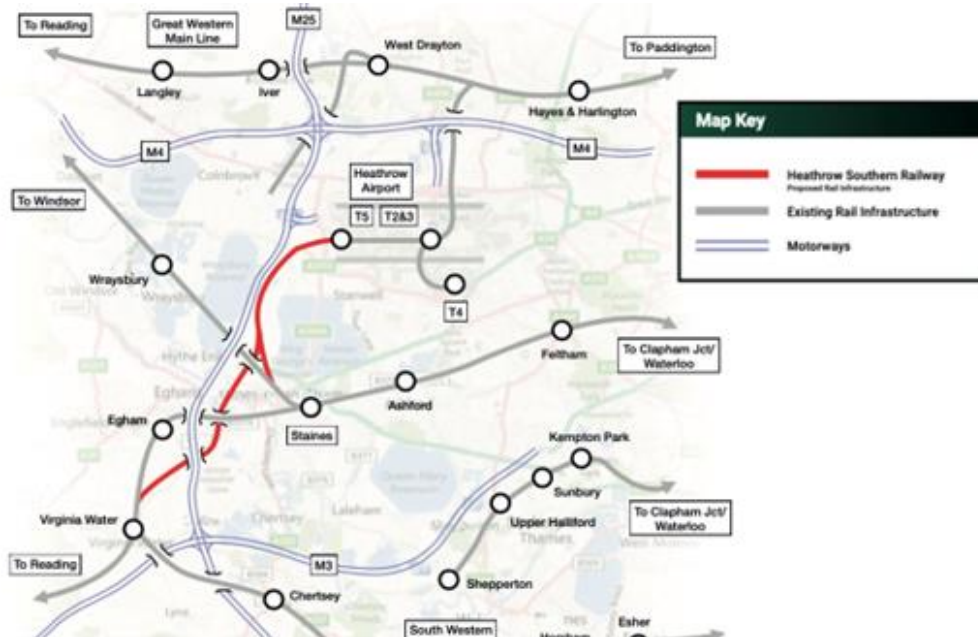
- One 1 to 1.5hrs recorded meeting with each party
- Discussion of specific aspects against Compare and Contrast criteria to verify and confirm positions of each party
- Additional aspects suggested considered

Collation of insights

- Insights collated and independent expert view articulated against Compare and Contrast criteria
- “Level of confidence” RAG provided for each aspect of the comparison
- High level complementary measures to HSR suggested

Introduction

Context



Heathrow Southern Rail Scheme

- Heavy Rail
- ~12 km of new track including ~10 km of tunnel
- Stations: Potential serving more than 12 existing stations incl. Staines and Ashford with proposed new stations outside Spelthorne
- Services: 6 to 10 services per hour from Staines to terminal 5 including extended Elizabeth line

Spelthorne Light Rail Scheme

- Light Rail – automated driverless system enabling high frequency
- Elevated throughout the ~8km route
- Stations: Heathrow Terminal 5 - Staines with potential intermediate stations at Hithermoor (for P&R) and Staines town centre.
- Services: Demand responsive automated 24/7 service. New independent light rail service.

HSR documents review

Document title	Date received	Content and aim of document	Key insights / comments
EA NE briefing meeting minutes, Dated 04/10/18		Introduce HSR project to Environment Agency (EA) and Natural England (NE), explain progress made to date in terms of identifying a preferred option and providing the opportunity for some initial discussion on likely key matters for EA and NE	<ul style="list-style-type: none"> • EA will hold detailed flood risk models • Tunnelling/portal construction in the vicinity of the Hithermoor landfill the most significant issue. • HSR to demonstrate that any impacts are unavoidable and that reasonable alternatives have been considered. • The area between the Wraysbury River and the disused railway was an area of lower habitat value compared to other areas. • National importance and rarity of the area within Staines Moor referred to as "Unit 12". • Fenland habitat is the most sensitive and therefore difficult to replace. • Policy requirement for the HSR project to demonstrate net biodiversity gain.
HSR Summary 231120 - Summary of benefits to Spelthorne, Dated 20th November 2023	09/02/24	Summarises the potential benefits of HSR to Spelthorne	<ul style="list-style-type: none"> • Document highlights the key features of HSR: high frequency (up to 10 tph); high-capacity services direct from Staines upon Thames to Heathrow; and surface alignment to avoid adverse visual and environmental impacts of new elevated structures on Staines town centre and residential areas.

HSR documents review

Document title	Date received	Content and aim of document	Key insights / comments
Letter from HAL	11/03/2024	HAL's letter of 21st December 2023 to Spelthorne BC's Leader	<ul style="list-style-type: none"> • HAL open to SLR but caveats include: no physical infrastructure at T5 for light rail option and compelling business case required for investment. • HAL continuing work with HSR although not promoting scheme. HAL responded to each of SBC concern re HSR.
Letter from TfL	11/03/2024	TfL's letter of 12th February 2024 to HSRL	<ul style="list-style-type: none"> • Articulates "in principle" support to HSR. Caveats include risk of delay contagion between Western and Southern networks, level crossings, track access charges, and turning capacity. Proposal for 4tph EL extension subject to additional paths to T5 to achieve extension.
TfL press coverage	11/03/2024	Recent press coverage (27 February 2024) of TfL specific support for extending Elizabeth Line over HSR to Staines	<ul style="list-style-type: none"> • References "strong business cases", links to article with HSR map, and mentions funding dependency.
Network Development and Third Party Pipeline Prog	11/03/2024	TfL's relevant development paper dated 28 February 2024	<ul style="list-style-type: none"> • Confirmed TfL have engaged on Elizabeth Line upgrade, including Heathrow to Staines via the proposed Southern Rail Link. Caveats include securing funding, local growth aspirations and confirmation of development potential. • Next steps for upgrade generally: further appraisal, operational feasibility and investment prioritisation.

HSR documents review

Document title	Date received	Content and aim of document	Key insights / comments
HSR comments for Arup 240311	11/03/2024	HSR mark-up on HSR/Arup meeting slides	<ul style="list-style-type: none"> Highlights the potential for additional 2 tph Elizabeth line services and additional 2 tph Waterloo service. Includes confirmation from the Environment Agency and Natural England of HSR's proposals (<i>in-principle approval</i>).
HSR summary 240311	11/03/2024	HSR summary against Compare and contrast criteria	<ul style="list-style-type: none"> Overlaps with 'HSR Comments for Arup' document: <ul style="list-style-type: none"> Highlights HSR's full integration with local bus services, including proposed Surrey CC Bus Improvement Plan. Journey time information Includes a map of proposed route, tunnel portal and SSSI areas.
SLR analysis 240311	11/03/2024	HSR analysis of SLR against Compare and contrast criteria	N/A

HSR documents review

Document title	Date received	Content and aim of document	Key insights / comments
HSR Briefing for Arup	05/04/23	Update on the Route, outline design, service proposal, proposed new stations and routes for delivery in terms of consenting and funding of the scheme.	<ul style="list-style-type: none"> Information on proposed service patterns including option for services to Reading. Funding and delivery routes via MLP1 and MLP2. Proposed consenting approach via TWAO or DCO if required. Proposed new station locations.
HSR Ltd website	N/A	N/A	<ul style="list-style-type: none"> No significant material beyond other documents.

The definition of the Market Led Proposals is given in the Government's MLP guidance*:

A **Category 1 MLP** is one which:

- Does not require public funding that is provided either directly or indirectly by central or local government such as government grants or public financing guarantees;
- Has no contractual requirements that involve government action such as changes to franchise agreements or usage guarantees;
- Involves no asset exclusivity requests, such as government guaranteed exclusivity for the scheme.

A **Category 2 MLP** is one in which one or more of the following is true:

- Public funding is provided either directly or indirectly by central or local government such as government grants or public financing guarantees;
- Contractual requirements involve government such as changes to franchise agreements or guarantees, such as usage guarantees; and
- Asset exclusivity is required, such as government guaranteed exclusivity for the scheme.

*https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/919245/rail-market-led-proposals.pdf

Spelthorne documents review

Document title	Date received	Content and aim of document	Key insights / comments
EOI Phase two – business case development Southern Light Rail	05/02/24	Section 1 – Detailed scope of innovation proposals Section 2 – Delivery model and commercial arrangements Section 3 –Financial model Section 4 – Company details Section 5 – Programme/timeline	Document provides insight into how the SLR will support local connectivity and assist HAL in delivering sustainable mode shift. No map or station / alignment design are provided within this document.
Innovation Partner Phase 2 Business Case Evaluation	Dated 07/01/2019 - previously received from HAL	Review the scope of the SBC proposal and any assumptions made. Determine if the proposal and assumptions are reasonable and realistic given knowledge of the airport.	Benefits acknowledged around fast delivery, connectivity and modal share. Key concerns include integration at Heathrow, contribution to the RAB, no detailed breakdown of OPEX and CAPEX and revenue forecasts.
Spelthorne Light Rail Proposal – Strategy fit study	Dated 25/02/2019	Comparison of SLR to a heavy rail solution against HAL's objectives	Alignment points include lower cost and faster delivery. Challenges include connecting to Heathrow terminals, requiring a mode change for wider connections into Central London and not providing direct connection to Woking.
https://www.itslconsultancy.com/index.html	Oct 2016	Alignment and structural form of London Air Rail Transit System	Visualisations are useful to provide context and illustrate ambition and scheme simplicity. It is not confirmed whether the scheme shown is fully aligned with the latest thinking from SBC.

Spelthorne documents review

Document title	Date received	Content and aim of document	Key insights / comments
Southern Light Rail Preferred Route	30/04/24	Southern Light Rail alignment	Proposed route includes three stations: Staines Central, Hithermoor Parkway, and Heathrow Terminal 5. The proposed route is alongside the Windsor Line and east of M25.
SLR HATF 11.22	30/04/24	Slide deck provides examples of current light rail schemes, highlights benefits of SLR, provides visualisations of the proposed scheme	<p>Inclusion of current light rail schemes provides an insight into the scheme's ambition.</p> <p>The benefits of the SLR scheme include high frequency to London Heathrow, minimal footprint on existing landscape including Staines Moor (no tunnelling or heavy gauge track), and modular construction.</p>
Spelthorne Update 250419	24/05/24	<p>Document identifies site constraints including physical constraints, ground elevations and shallow groundwater.</p> <p>Summary of dimensions of tunnel linking light rail into T5 and method of tunnel construction.</p> <p>HAL sets out light rail routing via Southern Parkway.</p> <p>MRT and GRT options summarised.</p>	<p>Physical constraints surrounding the proposed route includes M25, landfill and river diversions.</p> <p>HAL have shown the tunnel to have an indicative width of 10-11 metres and suggested that its gradient will be similar to road gradients – noting that a limiting factor of this is would be passenger experience. The method of tunnel construction would be cut and cover to get into T5X from south.</p> <p>Cross-section of light rail route via Southern Parkway.</p>

Spelthorne documents review

Document title	Date received	Content and aim of document	Key insights / comments
SLR diagram of indicative routes from Hithermoor	24/05/24	Southern and northern routes from Hithermoor	<p>Northern route runs immediately alongside the eastern side of the M25 until Poyle Interchange, and thereafter runs alongside A3113 Airport Way.</p> <p>Southern route runs south of Hithermoor Road, and west of Park Road – until Stanwell Moor Road and Park Road junction, where the route runs immediately alongside the western side of Stanwell Moor Road.</p> <p>Map presents elevated and tunnelled sections of both routes and identifies possible station locations.</p>
Financial Model v1.16	24/05/24	<p>Revenue forecasts made with HAL's own model and relate to the 2-runway airport.</p> <p>Figures have not been updated post pandemic and relate to the scheme submitted as part of the Innovation Partners bid/DfT MLP proposals process.</p>	<ul style="list-style-type: none"> Financial model estimates revenue, OPEX and CAPEX between 2018 and 2073. Revenue estimated as a sum of farebox; parking; advertising and ancillary; mail, baggage and cargo revenues. OPEX estimated as a sum of energy, operation and maintenance costs. CAPEX estimated as a sum of stations, Hithermoor Parkway carpark, track, 2-car train and 'other CAPEX'. Model outputs suggest SLR construction costs to be covered over the 55-year period, and profit to be made.
Conceptual indicative design_Parkway pick up set down points_May 2019	24/05/24	GRT route and GRT stops	<p>GRT route is south of Southern Perimeter Road, with 4 GRT stops. Section of GRT route runs immediately alongside the eastern side of the Stanwell Moor Road.</p>

Comparison framework

Following the HSR independent review, including an engagement session with SBC, and an initial review of the documents provided by SBC for their proposal of a Light Rail connection to Heathrow airport, we have set up the comparison framework below. This considers the various aspects where it is relevant to compare the two solutions, in order to better understand the merits of each scheme and the areas of improvement where one scheme or the other falls short of the Local Authorities' expectations.

The criteria identified speak to the strategic objectives of modal shift, connectivity and economic growth, as well as to the practical deliverability of the scheme in the local context. This is in line with the DfT objectives set out in 2022 and with the HSPG strategic outcomes for a Southern Access To Heathrow shown overleaf .



Connectivity for Heathrow staff living in Spelthorne: This considers the service frequency, hours of operations and service patterns of each scheme given that Heathrow airport is open 24/7. In July 2023, there are 2,313 colleagues living within the Spelthorne boundary across Team Heathrow.



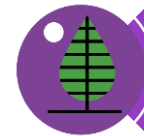
Economic prosperity: This considers direct economic returns to the Borough in particular. For example, would the scheme encourage travellers through Heathrow to visit Staines town centre?



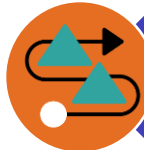
Affordability for Spelthorne residents: This considers the ticket price associated with each scheme, the applicability of Oysterisation and implication on price caps and schemes impact on the case for including Staines in the travelcard fare zone in the affordability section.



Public realm and accessibility – This considers the impact of the schemes to the public realm, including the existing mainline railway station at Staines, station access by pedestrians and cyclists and more general visual impacts along the corridor.



Impact on Staines Moor: This considers the impact of the schemes on Staines Moor, both during construction and operation. Staines Moor is designated a Site of Special Scientific Interest (SSSI) because of its nationally important floral communities and wintering wildfowl and waders.



Deliverability of the scheme: This considers the cost of the scheme, as well as the viability of the funding mechanisms currently proposed, including the propensity of the public and private sector to contribute.



Transport integration: This considers the impact of each scheme on the existing transport system including existing track capacity, as well as the more general transport integration risks and opportunities for each scheme.



Physical connection to Heathrow airport – This considers the location of physical connection of the scheme to Heathrow terminals and the complexity of the infrastructure works associated with this.



Wider benefits – This considers the potential for wider network impacts and the spatial extent of scheme benefits

Strategic outcomes for SATH



SATH enables a number of strategic outcomes – **with benefits that will be felt across the country**



Engagement with HSR

Date of engagement: 16/02/24

Persons present: Steve Costello, Mark Livok, Graham Cross, Mark Frost, Daniel Philips, and Pavethra Jegatheesan

Key items discussed:

- Criteria assessment
- Complementary measures
- In particular, the influence of train operators and TfL on fare structure, and HSR's proposals to invest locally to add additional areas to Staines Moor (an SSSI) alongside improving active travel links to increase accessibility to the site.

Engagement with SBC

Date of engagement: 04/03/24

Persons present: Heather Morgan, Daniel Mouawad, Malcolm Beecher, Lara Tabet, Daniel Philips, and Pavethra Jegatheesan

Key items discussed:

- Criteria assessment
- Complementary measures
- In particular, the integration of SLR with local bus networks and railway timetables due to its service frequency, and the role of Heathrow expansion in enhancing business in Staines town centre.

Compare and Contrast

Connectivity for Heathrow staff living in Spelthorne

Comment on HSR performance	Comment on SLR performance	Level of confidence of assessment
<p>The frequency from Staines to Heathrow, under the HSR scheme, would be up to 8tph depending on the proposed service.</p> <ul style="list-style-type: none"> • 2 tph Elizabeth line serving T5, T23, OOC etc • Potential for additional 2 tph EL – ideally what TfL would prefer, but under the current rail service at Heathrow is only 2 tph so would require additional 2 services from Hayes and Harlington to Heathrow and more Rolling Stock. • Potentially 6 tph Waterloo to T5 subject to train path availability and level crossing impacts and turn back capacity at Terminal 5 <p>The rail service would operate 5 am until midnight in line with NR / EL services. This considers necessary possessions for overnight maintenance and engineering works.</p> <p>HSR would provide connectivity to Ashford (and beyond), not only Staines. Proposal includes an extension of the Elizabeth line which would provide a direct connection to the Central Terminal Area (CTA – i.e. T2&3) in addition to T5. Employment at Heathrow is dispersed across the campus and some employees would need onward transport to other employment areas, for example around the perimeter roads.</p>	<p>The SLR service is demand responsive and would provide high frequency 24/7 transport for those accessing the airport from Staines and via a single interchange for areas of southwest London and Windsor. A 24/7 service is intended to be provided through an automated system. Further detail will be required with regards to the viability of 24/7 operations from an operational cost perspective.</p> <p>The high frequency of the service means that it can be integrated with the local bus networks and railway timetables to enhance public transport for Heathrow.</p> <p>A significant concentration (over 4,000 according to Spelthorne BC) of Heathrow workers in northern wards. Just under 25% residents in the northern borough wards working at Heathrow, however Heathrow employment is distributed over a wide area and would require onward transportation to reach the place of employment.</p> <p>This scheme will be particularly beneficial to HAL colleagues undertaking shift work and would otherwise have to drive from the areas around Staines town centre. Heathrow employment is fairly dispersed across the campus and some employees would need to onward transport to the CTA or other employment areas such as the perimeter roads.</p>	<p>Medium :</p> <p>Whilst a light rail service could provide 24-hour high frequency service, exact frequency likely to be subject to value for money evaluation with higher frequency incurring higher operational costs and increase up front capital cost.</p> <p>Frequencies on HSR are reliant on acceptability of timetable and adequate rolling stock and an agreement with operators' hours likely to match existing operating hours.</p>

Compare and Contrast

Economic prosperity and direct economic returns to the borough

Comment on HSR performance	Comment on SLR performance	Level of confidence of assessment
<p>From Staines mainline station which is a short distance from the town centre it would be a 6/10-minute journey time to/from T5/CTA. It would provide improved services compared to today to Waterloo/ Clapham Junction/ Richmond and direct connection to Old Oak Common and central/east London from Staines.</p> <p>HSR would offer direct connectivity to several destinations which would support the attractiveness of Staines including connections to Old Oak Common where HS2 will operate in addition to proposals to develop a new economic zone. The Elizabeth line would also provide a connection to central London and Canary Wharf and additional services to Waterloo would also support the attractiveness of Spelthorne.</p> <p>The better connectivity described above could lead to more growth in Spelthorne borough, including a sizeable shift for the Spelthorne airport related economic benefits if the higher end of HSR service ambitions is achieved (10 tph). This would be lessened* if the lower end of the HSR service ambition is achieved (6tph with potentially inconsistent timetabling).</p> <p><i>*Frequency is applied as a penalty when calculating generalised journey time benefits as per industry guidance</i></p>	<p>The SLR is a demand responsive service and has a 7-minute journey time from Staines to Heathrow. The proposed scheme is expected to have a 99% reliability in all weather conditions, 24 hours a day and seven days a week. The service frequency and 24-hour service means that the SLR could deliver economic returns to the borough.</p> <p>Heathrow third runway expansion was expected to deliver an increase in demand for hotel capacity and this could deliver returns of £168m in Staines town centre for hotels and a waterfront site in Staines upon Thames. Connecting to Heathrow directly will ‘unleash’ Staines and cater for people who want to do business in Staines town centre through better linking the airport economy to the town.</p> <p>Part of the proposal includes an interchange station at the high street. However, economic prosperity depends on further design decisions and improved access to Staines Station could also support access to the town centre.</p> <p>However, the connection is limited to connecting to Terminal 5, and therefore wider connections to Central London and Old Oak Common the Elizabeth Line are not as strong as a direct rail connection. In addition, it is to be noted that given that "Heathrow does not have the physical station infrastructure to incorporate the light rail scheme into Terminal 5", a connection into T5 is not confirmed at this stage.</p>	<p>Medium:</p> <p>The SLR service first and foremost responds to the requirement for high frequent connectivity improvement between Staines and the airport while HSR offers a less frequent service to Terminal 5 it connects Staines far more widely across London</p> <p>The economic growth associated with these two schemes is challenging to compare, with HSR benefits likely to accrue through connections Old Oak common and improved journeys to central London, SLR far more focussed on land value uplifts through increased commercial development linked to the airport growth.</p>

Compare and Contrast

Affordability for Spelthorne residents

Comment on HSR performance	Comment on SLR performance	Level of confidence of assessment
<p>HSR is not proposing to set fare levels and therefore it is the responsibility of those specifying and/or operating the train services to set the train fares, likely to be TfL and the operator of services from Waterloo.</p> <p>The HSR business case includes assumptions on the farebox income. The assumption from Staines to Heathrow is that it has the same pricing structure as Hayes and Harlington to Heathrow on the Elizabeth line which is higher than the standard zonal fare (although within the Zone 6 cap for those making multiple journeys per week).</p> <p>Staines could be part of the Fare Zone 6 if agreed with TfL and DfT, however TfL has not expanded Fare Zones with for introduction of the Elizabeth Line to Reading and Shenfield outside the GLA borders largely as fares would be sign. Both Staines and Ashford will be joining contactless zone (through the DfT/TfL Project Oval* which added 53 stations to contactless zone across the south-east), passengers travelling from Staines and Ashford will be able to pay by contactless payment cards when travelling to other stations within the contactless zone, all be it at higher fares then the TfL zonal fares. Expanding contactless payment has been the preferred government approach plan "to make fares and ticketing simpler and more convenient for passengers" in the south-east.</p>	<p>SLR hoping to be a mechanism to secure Zone 6 fares. Although, there are some concerns as SLR will not be operated by TfL and part of the TfL network.</p> <p>TfL has not extended oyster zones for the Elizabeth line and Staines is already due to join the extended contactless scheme which will enable tap-and-go fares from 2024. Other non-core transport modes do not operate on the zonal system. Staines is outside the GLA, so any loss of income from fare changes would be for the national government.</p> <p>The current assumption is that the ticket price will be equivalent to Zone 6 fare. In reality any scheme funded through private investment will need to fund operational costs and cover the costs of financing the scheme.</p>	<p>In reality, both schemes would need to recover considerable capital investment and fares would need be set which ultimately ensure the capital and financing can be repaid and if ultimately privately-owned and operated to maximise profit (for HSR this would be via track access charges).</p> <p>There is no significant evidence that TfL would add Staines to Zone 6 for either scheme given that Staines is already being added to the contactless structure as part of Project Oval and the Elizabeth Line extension has not led to new areas being added to the TfL zonal system.</p>

*<https://www.gov.uk/government/news/53-train-stations-to-benefit-from-tap-in-tap-out-rollout>

Compare and Contrast

Public realm and accessibility

Aspect compared	Comment on HSR performance	Comment on SLR performance	Level of confidence of assessment
Public realm and accessibility	<p>HSR proposes a sensitive restoration (i.e., building an extra platform entrance) of the locally listed station building, to the same standard as TfL’s improvements to existing stations newly served by the Elizabeth Line. The impact of constructing a new platform at Staines station depends on the detailed design – such that the new infrastructure could be accommodated within the current rail boundary and have no impact on the existing public footpath or cycle access.</p> <p>The scheme intends to provide a new northern entrance to the station, to improve pedestrian connectivity and active travel links to the town centre.</p>	<p>The SLR is proposed to run on elevated structures alongside the existing rail track (Windsor line) before turning north and running immediately alongside the eastern side of the M25. The SLR is said to bring ‘considerable (circle £350m) potential development opportunities in Staines-upon-Thames’. The impact of elevated structures on public realm, particularly in the town centre will need to be further considered with further detail.</p> <p>The proposed route is designed to connect Heathrow with the South Western rail network at Staines station. The interchange with Staines mainline station will be developed at detailed business case stage. The concept would be to provide an escalator for passengers to access the elevated SLR station from the mainline platforms.</p> <p>A new station at Hithermoor Parkway is proposed where the light rail would serve a new Heathrow car park with a proposed 5,000 spaces for cars and access from the M25. Whether this component would be feasible with the parking considered as part of the Heathrow parking cap or objections from key stakeholders such as National Highways is a risk to the parkway element, which may be to be a key revenue therefore impact overall scheme viability.</p>	Medium – to be determined in future design stages when the footprint of the new structure is confirmed for both schemes and when the interface between the new and existing assets can be confirmed.

Compare and Contrast

Impact on Staines Moor

Aspect compared	Comment on HSR performance	Comment on SLR performance	Level of confidence of assessment
Impact on Staines Moor	<p>The Environment Agency and Natural England have confirmed their in-principle approval of HSR’s proposals, noting that:</p> <p>HSR has minimised the impact on Staines Moor by adopting a tighter track radius, meaning train speed will have to be 30 mph. Additionally HSR propose an investment locally to improve the SSSI by altering footpath access and thereby, improve walking infrastructure and making the SSSI more accessible.</p> <p>In terms of tunnelling/portal construction - portal will not be in the SSSI; it will be near Heathrow to prevent building on SSSI land and therefore HSR does not interfere with most sensitive area (Fenland habitat) and would potentially add additional areas to the existing SSSI and improve accessibility to the site.</p>	<p>The SLR will run parallel to the M25, on an elevated track using minimal land take (columns at 40m intervals) and will not encroach upon Staines Moor - a SSSI. There is an assumption that the majority of the structure will be a precast elevated deck, reducing disruptions to Staines Moor.</p> <p>There will be no physical impact on Staines Moor. The footprint of the infrastructure proposed for the corridor is envisaged to be in Hithermoor and accommodated between the M25 and the westernmost boundary of the SSSI. Any visual impacts of SLR can be reduced by using third rail technologies, as opposed to overhead catenaries.</p> <p>It is to be noted that an elevated solution may create opposition for the visual impact aspects on the Moor and through Staines-upon-Thames.</p>	<p>High for HSR – EA and Natural England already engaged for the HSR proposal and written minutes have been provided.</p> <p>Low for SLR – no evidence was provided with regards to construction methodology that would completely avoid impact of Staines Moor</p>

Compare and Contrast

Deliverability of the scheme

Comment on HSR performance	Comment on SLR performance	Level of confidence of assessment
<p>There remain challenges to delivering HSR without commitments from government is reliance on a contribution from Heathrow Airport.</p> <p>Although it is understood that MTR have expressed interest in future phases, there is a need to secure approval for investment, or alternative investment in development stage and confirmation of delivery entity</p> <p>Confidential funding discussions continue with HAL and third parties over funding to support the development of the scheme and ensure overall financial viability. HSR have indicated that the scheme would be financially viable operationally with revenues able to offset operational costs (including those associated with rolling stock, station operations, access charges, etc.</p> <p>The latest capital cost estimate completed in 2023 by HSR had an estimate capex cost of ~£2bn. This includes infrastructure costs associated with any upgrade works as well as new corridor and station construction.</p>	<p>The SLR is described to have ‘the potential to be funded entirely through private investment’ and therefore, provide ‘value for money for the public’ and ‘not impose a financial burden on the Treasury’ making it a MLP1 scheme. Pre-COVID, there was interest (including City of London and International funds as well as in terms of the infrastructure (rolling stock, track) and from an operational perspective) but no formal agreement / subscribed investors currently.</p> <p>Fare box revenue will be complemented by parking revenues and that redevelopment of Staines-upon-Thames town centre will generate further funding for the scheme to support debt repayment. Some high level modelling has been undertaken with regards to revenue streams. Further detail will be required to robustly confirm fare box revenue and integration into Zone 6 is achieved or how the scheme would work without car park revenue.</p> <p>CAPEX of SLR is estimated under £400m (in 2019) – this includes the development of stations, track and rolling sock, the redevelopment of Staines station, a parkway station, with the costs of the station at T5 to be included in the Heathrow Regulated Asset Base (RAB). The key benefit of light rail is assumed to be lower operational costs enabled through driverless operation and lighter vehicles however operating at high frequency does create higher operational costs.</p> <p>SLR have indicated that they schemes would be financially viable operationally with income from parking and fare revenue. The scheme has not changed; therefore, the cost will need to be updated to reflect 2024 prices.</p>	<p>Low – no concrete evidence of business plan or full cost/benefit analysis or funding commitments for either scheme. Whilst capex estimates have been provided, they are not a like for like comparison and may use different calculation methods and price basis.</p> <p>In particular, the level of detail achieved by HSR Ltd in terms of CAPEX and OPEX calculation is significantly higher than that which has been made available by SBC. This results in less uncertainty around costs for HSR in that respect.</p>

Compare and Contrast

Transport integration

Comment on HSR performance	Comment on SLR performance	Level of confidence of assessment
<p>HSR would integrate within the existing substantial heavy rail network, enabling regional, as well as national connections. HSR services will serve existing stations, with proposed additions where business case/Local Plan policy are supportive – e.g.: development of proposed Bedfont Lakes station supported by London Borough of Hounslow. Additional stations have been proposed near Addlestone and Bracknell to support demand growth.</p> <p>There is potential to run services from Heathrow Airport to Woking, Guildford and beyond. These services would have to bypass Staines due to track configuration but could connect to Staines with one interchange.</p> <p>HSR would utilise track capacity on Windsor Line and South West Mainline, making use of existing grade-separated Byfleet Junction. Some risks of connecting two rail mainline (Great Western and South West) would require high level of reliability to prevent risk of delay impacts on key rail routes.</p> <p>There are complementary measures to HSR that can go some way towards filling the gap between what is currently proposed by HSR Ltd and the outcomes of a Southern Link to Heathrow which Spelthorne Borough Council would hope for. These include:</p> <ul style="list-style-type: none"> • Bus (X) 442 runs from Staines station to Heathrow including overnight serving the station and could be continued as a frequent night service. • HAL’s vehicular Heathrow Southern Access Tunnel proposed for expansion could provide bus priority and include specific provision for active travel measures, if it is progressed in future. • The proposed HSR infrastructure at Staines station would include new bus interchange facilities and cycle provision – e.g. as a Mobility Hub. 	<p>The SLR scheme includes the proposal for an intermediate station at Hithermoor Parkway (in Spelthorne) with parking available for accessing either the airport or London and a potential town centre interchange .</p> <p>Passengers travelling from outside Staines would need to interchange at Staines which reduces the connectivity particularly to other areas of Surrey such as Woking and Guildford where there are no direct services to Staines and would require at least 2 changes which would make the journey significantly less attractive. Current services from Staines serve Windsor, Waterloo via Richmond and Weybridge via Addlestone and Chertsey.</p> <p>In addition, although the SLR scheme is envisaged to be an automated 24/7 service, it is to be noted that interconnecting rail services wouldn’t be 24/7 which would limit 24/7 access to passenger boarding at Spelthorne.</p> <p>The SLR scheme does not provide direct connectivity to Terminals 2,3 and 4 and passengers would have to utilise the bus or rail network for this adding an additional interchange penalty.</p> <p>At this stage, and given that it has been confirmed by HAL that "Heathrow does not have the physical station infrastructure to incorporate the light rail scheme into Terminal 5", the connection of SLR to Heathrow is unconfirmed</p>	<p>Medium – further integration measures to be determined at next design stage.</p>

Compare and Contrast

Physical connection to Heathrow airport

Comment on HSR performance	Comment on SLR performance	Level of confidence of assessment
<p>HAL confirmed T5 box can only be used for heavy rail solution but would require alterations required to the station facility to make it suitable for an increase in interchanging passengers and an increase in overall demand. This could impact vertical circulation and gateline requirements, however the passive provision within the T5 station box vertical circulation cores are sized for forecast passenger volumes and peaks.</p> <p>It is likely there will be some disruption during construction of track and final integration with the existing rail systems and structures operating to T5.</p>	<p>The intention is that the SLR links to Heathrow’s terminals ‘at grade’ (although T5 itself has multiple grades) providing a seamless service for passengers into the terminal building. However, there is no current design proposal for the connection into T5 which would present a significant design challenge given the existing layout including T5 multi storey car park, highway layout and potential security impacts.</p> <p>In addition, HAL have confirmed that it " does not have the physical station infrastructure to incorporate the light rail scheme into Terminal 5".</p> <p>The station connections at Staines would also present a significant design and deliverability challenge building above an existing operational railway.</p> <p>The scheme could be flexible, in terms of structural form but requires HAL and Network Rail input/preference where it interacts with existing assets.</p>	<p>High – HAL has now confirmed that existing tunnels are safeguarded for heavy rail schemes only.</p> <p>SBC have not provided further detail on how the integration with Heathrow Terminal 5 would be designed.</p>

Compare and Contrast

Wider benefits

Comment on HSR performance	Comment on SLR performance	Level of confidence of assessment
<p>Spatial extent of core benefits from HSR would include Thames Valley, Surrey, Hampshire, South London and South Coast via connections at Woking/Guildford.</p> <p>The benefits of a connections are likely to be:</p> <ul style="list-style-type: none"> • Journey time savings for passengers, • Reduced congestion and carbon emissions and airport quality impacts through modal shift to rail from car. • Improved access to key jobs markets from areas connected by rail to the airport and growth areas such as Old Oak Common. • Supporting inward investment through improved connectivity from the UK’s hub airport and improved links to the rest of the UK via HS2. • Supporting investment in town centres through better connections at existing stations within Surrey and externally. <p>The above benefits would support economic growth throughout the region, and particularly those areas with improved / new connections.</p>	<p>SLR will provide significant journey time savings to passengers, as well as reduced congestion (and associated improvement in air quality) and carbon emissions in the Spelthorne area.</p> <p>The SLR demand responsive service is anticipated to correspond to potential development opportunities (circa £350m) in Staines-upon-Thames. Development may be limited to certain industries, namely hotels.</p> <p>The initial work by SBC was part of the 2018 Heathrow Innovation Partners process and suggested over £1bn of regenerative growth and investment in Staines linked to SLR. It is to be noted that it is not clear whether the current political administration prioritises development in Staines to the same extent.</p> <p>The benefits to areas outside Spelthorne from the SLR scheme are far more limited. There is an improvement in airport connectivity for areas on the Windsor lines to areas such as LB Richmond and LB Hounslow however the improvement in connectivity still requires an interchange at Staines using existing rail services and that is likely to be less attractive than a direct service.</p>	<p>Low – It is expected for a regional scheme like HSR to have higher absolute value of benefits than a local scheme. However, a regional heavy rail scheme will also have higher associated capital and operational costs.</p> <p>The wider economic benefits from the schemes are uncertain and require further assessment and quantification based on like for like comparison of the full benefits and costs of each scheme.</p> <p>However, a full alternatives assessment is not formally required at this stage as both schemes are Market Led Proposals that do not require an HM Treasury contribution so there is no public sector requirement for a business case* in line with Green Book guidance.</p> <p><u>*Guide to developing the Project Business Case (publishing.service.gov.uk)</u></p>

Case study: the Elizabeth line

A key element of the economic case for the Elizabeth line was the wider economic benefits that it was expected to bring about. Two main wider impacts added to the economic case:

- Move to more productive jobs – enabling more people to access jobs in central London, where productivity is higher on average
- Agglomeration – boosting productivity by better connecting jobs in different areas

Productivity benefits were expected to accrue across all London boroughs, with impacts most pronounced along the route alignment. These impacts can accrue anywhere that benefits from improved connectivity, although they are likely to be stronger with higher frequency due to the increased capacity and better accessibility that this provides.

An evaluation of the wider impacts has not taken place yet, but [analysis](#) published by TfL suggests that the Elizabeth line has had a positive impact on journey times to central London, particularly from Heathrow, and generated new demand that did not exist prior to the EL opening, indicating that it is delivering benefits overall.

Summary

Differentiators and risks/uncertainties

Key differentiators of HSR

- Greater connectivity and seamless integration with the existing heavy rail network including direct link to Heathrow CTA and central London
- Benefits from connecting Staines to the Elizabeth Line and wider spatial extent of benefits across the region
- Interest and engagement from MTR Board for next phases

Key outstanding risks / uncertainties

- Funding gap and delivery/operating model
- Track capacity utilisation on rail network potentially limiting service frequency
- Economic returns to Spelthorne Borough through direct connection by heavy rail dependent on service frequency

Refer to the outcome of the independent review for more detail on the evaluation of the HSR Ltd scheme

Key differentiators of SLR

- Proposed demand responsive service from Staines
- More opportunity to enhance economic prosperity and direct economic returns to Staines town centre for faster and cheaper delivery costs, provided a connection to T5.
- Delivery would not utilise capacity on the rail network

Key outstanding risks / uncertainties

- Station connection at Heathrow Terminal 5 is likely to incur significant technical and cost challenges given the airport environment. No solution is currently being proposed by SBC.
- Overall cost, including provision for a “turn-up-and-go” service, and associated investors
- Lack of wider coverage and benefits beyond Spelthorne

Conclusions

- A key conclusion from this exercise is that the two proposed Heathrow southern access schemes have different priorities and therefore achieve different outcomes. This is highlighted throughout the exercise, from service levels to wider benefits. It is therefore key for HSPG and HAL to confirm whether the priority for a Southern Access Link to Heathrow is a more comprehensive regional reach or a more affordable local access and regeneration scheme.
- From our engagement with scheme proposers, it is clear that the HSR scheme is further developed than the Southern Light Rail scheme. This is the case both in terms of concept, but also with regards to stakeholder engagement beyond HSPG and with investors. This has contributed to varying levels of confidence in the comparison of the two schemes across the various criteria.
- One significant uncertainty resulting from the current level of detail provided by SBC is around the viability and cost of the connection to the airport at T5.
- Given the different outcomes and scale of impact achieved by each scheme, consideration should be given to the development of a package of transport solutions that would enhance the benefits for both regional and local residents and stakeholders.
- Although both schemes are considering a market-led route, which is welcome by HSPG and other stakeholders as it enables delivery without central government funding, neither scheme has at this stage a robust demonstration of the funding mechanism without significant third-party support. This, together with a clear delivery model and entity, would be a key differentiator for scheme feasibility.

Recommendations and next steps:

- HSPG and HAL to confirm key priority outcomes for a Southern Access to Heathrow connection;
- HSPG to consider the complementary aspects of both schemes;
- SBC to review and confirm the connection of SLR at T5 and agreement with Heathrow;
- SBC to re-investigate and confirm investors' interest in SLR;
- SBC to consider the merits of HSR if it were to achieve higher service ambitions and to include the complementary measures suggested;
- HSR Ltd to confirm resolution for current funding gap;
- HSPG to consider doing a robust alternatives assessment or TAG-compliant independent economic assessment that would seek to quantify both costs and benefits associated with each scheme.

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