

ARCADIS GUIDANCE TO THE CIVIL AVIATION
AUTHORITY ON HEATHROW EXPANSION PROGRAMME

HEATHROW EXPANSION PROGRAMME PROCUREMENT STRATEGY REVIEW



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Arcadis Guidance to the Civil Aviation Authority

Heathrow Expansion Programme Procurement Strategy Review

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Glossary

Abbreviation	Description
4LM	4 Lines Modernisation programme
BIM	Building Information Modelling
BAU	Business as Usual
CA	Concept Architect
CAA	Civil Aviation Authority
CBI	Complex Build Integrators
CIP	Corridor Improvement Programme
DCO	Development Consent Order
DfT	Department for Transport
DIP	Highways England's Delivery Integrator Partnership Programme
GWBS	Group Work Breakdown Structure
HAL	Heathrow Airport Limited
HEP	Heathrow Expansion programme
ICE	Institute of Civil Engineers
ICT	Integrated Client Team
IDT	Integrated Design (&DCO) Team
IFS	Intendent Fund Surveyor
M4	Governance Milestone Gateway 4 – (Single Preferred HEP Masterplan Design Signoff)
MC	Main Contractor
NPS	National Policy Statement
OJEU	Official Journal of European Union
PCP	Programme Client Partners
PM	Project Management
PMO	Programme Management Office
Q6	Quinquennium 6 Capital Investment & Asset Management Programme
SME	Subject Matter Expert(s)
T2	Heathrow Terminal 2
T5	Heathrow Terminal 5
TfL	Transport for London
WBS	Work Breakdown Structure

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1 Executive Summary

1.1 Scope of work

Arcadis have been appointed by the Civil Aviation Authority (CAA) to provide technical advice in support of their work on capacity expansion at Heathrow Airport.

Historically the CAA have not reviewed Heathrow's procurement strategies. However, several factors including the scale, complexity, risk and impact of the Heathrow Expansion Programme (HEP) and the role of the procurement strategy in successful design and delivery, meant that the CAA saw a clear and pressing need to engage and assess the HEP procurement strategy for further information.

Arcadis were requested *"To provide the CAA with information about the current state of play in relation to [Heathrow's] procurement strategy for airport expansion."* The CAA noted that this was primarily an information gathering exercise but presented Arcadis the opportunity to provide appropriate insight relating to Heathrow and their procurement activities.

Arcadis commenced the scope of work regarding procurement on 09 April 2018.

This report is provided as commentary of the *'current state of play'* as of June 2018.

Arcadis appreciate that the HEP and procurement strategy will continue to evolve. We understand there will be further developments with regard to the HEP, and an associated impact on procurement activities following our report.

1.2 Arcadis' approach to the scope of work

Arcadis believe that an appropriate procurement strategy is fundamental to the success of any major infrastructure programme. Procurement has a far-reaching impact on any capital expenditure project, and it is only amplified on a project of the size and scale of the HEP.

Arcadis completed this scope of work by primarily reviewing key documents provided by Heathrow. The documents reviewed are detailed within our report and listed in Appendix 10.2. Specific reference is made to the HEP Overarching Procurement Strategy and the HEP Construction Packaging Strategy as critical documents in the current development and future progress of the HEP procurement strategy.

Arcadis also held several sessions with the HEP leadership team and members of the Heathrow commercial and procurement teams. These individuals and the relevant meetings are detailed in section 2.3.2.

Throughout our review, Heathrow were transparent to an appropriate degree in their work completed to date and plans going forward. Heathrow also provided suitable access to key stakeholders, including [REDACTED], HEP Programme Director. Other senior personnel were made available and were willing to provide and discuss information relevant to our review.

Arcadis would like to state that the engagement with Heathrow in completing this scope of work has been extremely productive. Heathrow has provided suitable time, resource, documentation and information.

In completing our review, Arcadis note that, at present, large parts of the procurement strategy and procurement development remain at a 'high level'. This is due to the current stage of the overall HEP lifecycle. Several of the documents provided by Heathrow will be revised and amended as the programme develops, such as the Overarching Procurement Strategy Document (DG0) and Construction Packaging Strategy. We appreciate these are iterative documents that will continue to evolve at least until the M4 gateway exit, when Heathrow will have agreed their single preferred Masterplan ('Masterplan') and developed a more detailed programme on how to deliver it.

A summation of the key findings from this report have been shared, via a presentation by Arcadis team members, to both the airline community and HEP leadership. Feedback, comments and additional information from those engagements have been incorporated into this report where appropriate. The HEP leadership have commented on several occasions regarding the positive nature of the engagement and that they are pleased with how the review was conducted by Arcadis and the value it added to their programme.

1.3 Guide to reviewing this report

Arcadis have defined procurement in relation to this scope of work as, “the act of obtaining or buying goods and services. The process includes preparation and processing of a demand, through to the end receipt and approval of payment”.

We use ‘procurement strategy’ to describe a wide range of activities related to procurement and not limited to the process of placing specific contracts out to tender.

We have set the scope of this procurement review to include activities up to and including 2026 which is the date the current Heathrow strategy extends until. This date is the target date for what Heathrow call Expansion Phase 1 of the HEP delivery.

In this report we refer to ‘Heathrow Airport Limited’ (HAL) as simply ‘Heathrow’ and we use ‘The Client’ to refer to the Integrated Client Team (ICT).

We also provide definitions and parameters for terms such as ‘procurement routes’ and ‘engagement models’, amongst others, within the report. We do so to provide clarity regarding Heathrow terminology for the benefit of the CAA, and to contextualise our assessment and commentary.

We also provide recommendations for future action or detail expectations of further activities or development of the procurement strategy. As a general guide we utilise two terms; the “immediate future” which means within the 0 – 3 months from the date of this report and “near future” which means within 3 – 6 months from the date of this report.

We have refrained from making judgements on whether Heathrow’s strategy is, or is not, deemed ‘Best Practice’ in this report. Instead, we seek to provide an opinion as to the suitability and appropriateness of the activities completed and information provided by Heathrow.

We have not conducted a detailed comparison to industry ‘Best Practice’ as this would require a more rigorous and detailed review than we deem valuable to the CAA at this stage in the HEP. As such, Arcadis have also not included extensive desk research or benchmarking activities against other programmes or organisations to provide comparisons at this time.

As this is primarily an information gathering exercise, we endeavour to summarise the adopted procurement approach by Heathrow. Our scope does not include a detailed and granular analysis of all possible alternatives to this current / proposed approach.

Finally, the scope does not extend to an evaluation of existing procurement events completed by Heathrow or their outcomes. However, where previous procurement events and their outcomes have had, or will have, substantial effects on the development of the HEP procurement strategy, we have sought to provide relevant information.

1.4 Key themes and items of focus in our report

We seek to provide a summary of key themes and items of focus from within our wider report. These items and topics are those that Arcadis deemed particularly relevant to the CAA. They represent highlights of our assessment and/or items we consider in need for further discussion and review by Arcadis, the CAA, and/or Heathrow.

These themes and items are summarised for the benefit of the reader of the report. Further information and wider context can be obtained by reading our report in full. We strongly encourage any reader of this report to read the full contents to ensure appropriate consideration and context for our summaries.

1.4.1 National Policy Statement (NPS) and Masterplan

On 5th June 2018 the UK Government published their NPS on increasing airport capacity in the south-east of England.

On 25th June, parliament voted in favour of the proposed NPS in the House of Commons. Until that point in time, Heathrow had undertaken the Expansion Programme planning under an assumed risk that the government may choose not to support the programme.

The NPS, and prior lack of the NPS, acted as a known risk and impacting area of uncertainty in our engagement with Heathrow.

Heathrow had previously stated *“no firm commitments would be given to shareholders until a favourable NPS was granted”* but should a favourable NPS be issued prior to end of Q3 2018 Heathrow were confident the programme and associated procurement plans could be delivered against the current developed timeline.

This uncertainty is now removed, although Arcadis do note the pending/potential Judicial Review proceedings lodged by stakeholders regarding the decision. Nevertheless, the vote on the 25th June 2018 should encourage Heathrow to have more conviction in their programme and procurement strategy going forward. Heathrow are now able to begin making clear and definitive commitments to their shareholders regarding the Expansion Programme, which importantly includes the finalising of the masterplan.

However, during our engagement (April to June 2018) there was uncertainty relating to the NPS.

Additionally, in our engagement, the status and yet to be determined single preferred masterplan for the HEP was an additional uncertainty.

Arcadis recognise the Masterplan is a major and significant factor that will inevitably influence HEP and the procurement strategy. We note that Heathrow are undertaking an iterative approach to design and the Masterplan.

This is initially more time consuming and costly than seeking to ‘lock-down’ all key, and otherwise, components of design simultaneously from the outset but our view is that this is a pragmatic approach for the HEP. It should help to mitigate the risk of design clashes later in the programme and at more detailed design stages. Nevertheless, such an approach does impact on procurement strategy and planning notably by delaying decisions in relation to procurement until the Masterplan and components of design are confirmed.

For the reasons described above, we note that both the NPS and Masterplan should be understood as a caveat throughout our review and these uncertainties impacted our review. Our assessment and commentary in this report, on occasion, is limited because of these uncertainties and we indicate the impact of these uncertainties on the development of the HEP procurement strategy.

1.4.2 Heathrow’s approach to Procurement

Heathrow has captured and shared several aims for the Heathrow Expansion Programme. In addition to the Heathrow Expansion Programme aims, Heathrow have provided information of their ‘Key HEP Procurement Principles’ and several specific commitments as to how they will deliver the expansion.

The ‘Key HEP Procurement Principles’ are to be adopted for all HEP procurement events and have been through stakeholder engagement. However, it is currently unclear exactly how the commitments will be transferred to the HEP supply chain, and the model Heathrow will adopt to drive and monitor their success. Arcadis propose that Heathrow review and assess these commitments and detail those that will be imposed on their supply chain. This is important as they are likely to impact on future procurement events, programme delivery, and potential HEP cost.

Heathrow also noted the ambition and belief that *“the correct packages paired with the correct procurement strategy will ensure best value overall.”* Our view is that Heathrow should determine what constitutes ‘best value’ more explicitly.

An additional ambition expressed by Heathrow is their desire to be a very ‘hands-on’ client. To achieve their ‘hands on’ approach Heathrow, along with the Programme Client Partnerships (PCP), will create an Integrated Client Team (ICT). As such, Heathrow expect to be actively involved in the contracting and management of the supply chain and across the majority of the programme. They will likely do so by utilising a large number of integrator contracts in the HEP. This is a somewhat different approach to that taken on Terminal 2 (T2), and an approach more closely aligned to that of Terminal 5 (T5) which was similarly ‘hands-on’.

Arcadis feel this approach, given the circumstances, is a logical decision by Heathrow. Arcadis are aware of instances where asset management clients have had to revert to a more active and involved role in managing their supply chain at later dates. Often this is to address a lack of performance. Heathrow are seeking to avoid this from occurring with HEP which is sensible. This 'hands-on' approach is also championed by the Infrastructure Client Group initiative Project 13, an industry initiative aimed at improving performance.

Heathrow, as a client, are confident they will be able to attract the appropriate pedigree of contractors, via suitable competition, and the necessary skills in the market to deliver the HEP successfully.

We see no reason to disagree with these assumptions at this stage of the programme. We would encourage Heathrow to further consider this and conduct a greater review of their ability to attract and retain the necessary skills required for procurement and more generally for delivering the HEP. Considering the UK infrastructure market is relatively buoyant and the known and obvious wider socio-political considerations, which will impact the market and the UK in coming years, Heathrow will need to be attune to developments and should be periodically assessing the skills capacity in the market and any impact on their programme.

To date though, it is positive to see that Heathrow have completed an assessment of the market and expressed an intention to complete a further review. They have also demonstrated they are aware of the risks and are being proactive to mitigate any impact. This was demonstrated by their articulation of 'capability of suppliers' being one of the top two most critical driving forces behind the considerations of their early packaging strategy.

1.4.3 Procurement timeline and development

The HEP is split into 3 major phases:

- Development Consent Order (DCO) Design & Delivery Planning Phase (present – 2021/22)
- Delivery Phase (2021/22 – 2025/26)
- Operational Readiness (2023 – onward)

The timeframes detailed for the HEP and articulated to Arcadis during this review are not fixed and often came with strong caveats.

However, the HEP procurement timeline has been produced by reverse analysis from the opening of R3 (anticipated for 2026). There also remains a level of flexibility in the HEP procurement programme and associated timescales. Several key dates and milestones in this timeline are neither confirmed or fixed at this stage of the programme.

Arcadis appreciate that given the uncertainties, detailed within this report e.g. the lack of Masterplan, that elements of the procurement strategy and timeline need to remain flexible now and to a degree in the future. Heathrow have delayed making commitments, on occasion, with regards to their procurement strategy or elements within their procurement strategy.

We expect Heathrow to begin to set more firm dates and milestones for key procurement events and activities as these uncertainties are removed and the programme develops in detail.

In our review of the existing procurement timeline, our view is that it is at a slightly higher level than we would hope for at this stage in the programme. Noting the above uncertainties and lack of firm commitments, we would still have liked to have seen more detail. Detail including a breakdown of the procurement programme and more clarity around the anticipated critical path activities. Arcadis believe this could have been completed and provided, even if only based on assumptions at this stage of the HEP.

Whilst the level of detail did not meet our initial expectations, we do not see this as alarming nor necessarily detrimental to the HEP success at this stage of the programme.

We would instead expect to see further development of the timeline in the immediate future and following decisions regarding the NPS and Masterplan in particular.

This means that Q3 and Q4 of 2018 will be a very busy period for the programmes design and procurement development. Should there be slippage in this programme stage, then subsequent compression of procurement timelines may make it more difficult to achieve best value.

With the attention for 2018 being focused on ensuring HEP and market readiness, 2019 will present the first opportunity to procure various contracts associated with the delivery of HEP. Therefore, Arcadis believe 2019 will be a critical year for the HEP and procurement success.

2019 will also provide a benchmark as to the organisations ability to manage large quantities of spend effectively for the HEP, as procurement activities for several of the schemes key components will commence between now and July 2019. This includes ‘early works’ procurement events Heathrow have determined likely to be required and to begin earliest in the HEP programme (more detail of this term is provided within our report).

As such, it is reasonable for Heathrow to focus their current attention on these activities. Heathrow are keen to ensure these events are run successfully, are set up correctly, and enable effective management of the supply chain.

One of these early works, the M25, presents one of the larger and early challenges for Heathrow. As a key component for the HEP, it will be a significant test of Heathrow and their programme, procurement approach and capability.

We believe Heathrow should be proactively considering their engagement model and preferred routes to market for this key component. This is due to the asset size, scale, complexity and the stakeholder influence. It is also significantly different to other aspects of the programme and to the experience within Heathrow.

Overall, with regards to the Procurement timeline, Heathrow have a very busy 12-15 months and a condensed period for procurement development activities. We note that the commitment on preferred procurement routes and subsequent market engagement for all ‘early works’ would be on the critical path if the commencement of procurement activities slips from July – August 2019 to Q4 of 2019.

We see no reason, at this point, as to why Heathrow would be unable to complete this development successfully. To date Heathrow, in their approach and development of current timeline, have given due consideration, appropriate thought, time and experience to the development of their procurement strategy.

To continue to be successful, Arcadis believe it is important to recognise both the need for suitable numbers and appropriate quality of resource in these future periods. Such resource will need to be sustained over the programme. As noted in this report, the HEP leadership seem acutely aware of their needs and confident they will be able to present appealing opportunities to the labour market and receive adequate numbers and applicants.

We agree that Heathrow has a strong presence as an employer, but that resource availability is still an area that Heathrow should continue to closely monitor. Capacity constraints are a potential to disrupt the programme and impact cost.

1.4.4 Engagement Models and Procurement routes

The Heathrow ambition is that *“the correct packages paired with the correct procurement strategy will ensure best value overall.”* In this context their ‘procurement strategy’ refers primarily to two elements:

1. Engagement model: The type of organisation they would prefer to deliver that package
2. Procurement route: The method/process through which Heathrow would identify the most appropriate and capable organisation with whom to contract.

To date, Heathrow has considered their proposed ‘engagement models’ in greater detail than their possible or proposed ‘procurement routes’. This is not significantly concerning, at present, given a lack of Masterplan. The lack of a Masterplan prevents a likely or confirmed packaging structure which in turn prevents determining the appropriate and ‘best’ procurement route.

As such, Heathrow has been clear with Arcadis that no individual procurement routes have been discounted at this stage in the programme.

At this stage in the expansion programme, with regards to engagement models or procurement routes, Heathrow has emphasised that *“nothing is off the table”*.

Heathrow’s position is that at present, the current thinking regarding procurement strategy is ‘in draft’ and may evolve as design approaches a single preferred Masterplan. Heathrow therefore have expressed a view that they are keeping all options for procurement routes open.

Arcadis note however, that certain decisions relating to procurement are time constrained. Options will be removed, or their feasibility will be minimised, as other elements of the HEP develop and/or other milestones are presented. Heathrow will, irrespectively, be required to provide more definitive plans in the near future for their procurement strategy and as such for their engagement models and procurement routes.

1.4.5 Programme Management and Organisation

An integrated procurement and Programme Management Office (PMO) will be critical to HEP success. This is highlighted by the number and size of interfaces planned for the HEP and their proposed operating model.

The PMO will be a major interface with procurement and there will be several interdependencies between procurement and governance gateways, and key milestones of the programme as managed by the PMO.

The criticality and planning of this PMO is heavily influenced by the timeline and phasing for the HEP. It is our view that a more detailed HEP timeline will be needed in the immediate future. This in turn will enable Heathrow to complete an evaluation and to generate a plan for their PMO.

However, our view is that Heathrow appears to have considered important elements of how to build their PMO and delivery plan in accordance with their current timeline. They have a commitment to continue to utilise an experienced and suitably skilled team to fulfil the procurement functions of the HEP and likewise will seek to recruit and retain the numbers and quality of team members for the PMO and wider programme. The HEP procurement team and the associated PMO will ‘ramp-up’, alongside the development of the HEP structure and programme in 2018 and 2019. Heathrow have indicated the culture and ways of working they wish to adopt for the PMO. They appear aware for and prepared to make key appointments for the PMO and the options for recruitment.

Given the programme size and current HEP organisation structure, our view is that adequately recruiting and developing PMO team members will take time and commitment on behalf of Heathrow. Arcadis note that there are significant numbers required to meet the needs of the HEP and to adhere to current key milestones. A review of progress would be appropriate in Q4 2018 / Q1 2019 given its critical nature. Further insight could then be gleaned, and an evaluation of progress provided. It would also enable an assessment of future PMO planning and the risks and mitigations in place by Heathrow.

1.4.6 HEP progress to date and future ways of working

To date, there have been several procurement events carried out for the HEP. These have primarily, but not exclusively, been services aimed at ensuring appropriate Expansion Programme planning, readiness and the development of the necessary components of the DCO and preferred Masterplan.

Previously procured key services include:

- Programme Client Partnerships (PCP)
- Integrated Design & DCO Team (IDT)

The Programme Client Partners (PCPs) were appointed in November 2016 to assist Heathrow in creating an effective, experienced and sufficiently well-rounded client organisation for the HEP.

Together with Heathrow these PCP organisations make up the Integrated Client Team (ICT). The ICT is not a legal entity or joint venture, but a common relationship based on a framework agreement for professional, programme, and project services. Heathrow wish to maintain one type of relationship with all four PCPs and ensure consistency across the ICT.

Heathrow is pleased with the outcomes of their procurement activities to date and the processes, outcomes, and behaviours currently in operation. This will, to some degree, influence future procurement events as Heathrow is keen to drive similar behaviours in their supply chain relationships.

It is positive to note that Heathrow has ambitions to incorporate learning, industry practice and forms of innovation to HEP and their procurement strategy. Our review has not focused, in depth, on these areas as we believe it too early to be a worthwhile exercise. Nevertheless, for example, Project 13 ways of working are a stated ambition. The HEP has been chosen to be one of four 'early adopter' programmes under Project 13 and Heathrow's Expansion Programme Director is leading one of the initiatives five workstreams (Capable Owner). We propose that these ambitions and their success be monitored going forward.

1.4.7 Integrated Design

Arcadis would like to note that it will prove critical that Heathrow ensure the close integration of design and delivery.

Given the tight timelines post M4 it will be of critical importance to the HEP that Heathrow's design and procurement teams are adequately established, prepared and aligned. This will enable them to define user requirements/client specification sufficiently early and facilitate the commencement of procurement.

We have not seen any evidence to suggest design and delivery will not be integrated in the future or that these teams are/will be misaligned. At this stage in the HEP, we understand that Heathrow do not have the level of maturity in design to release any construction packages to the market.

The ongoing uncertainty in design does increase risk, lower the certainty of cost, and increase variability in the HEP timeline. However, with the development toward a Masterplan, the maturity of design will increase and as the M4 milestone is passed this risk will begin to reduce. Procurement can then be more effectively aligned with the finalised design.

To be successful, Arcadis would encourage a close alignment of the design and delivery phase of works. It would be beneficial for Heathrow to better articulate the interface between design and delivery both at this stage and for future stages of the HEP.

1.4.8 Official Journal of European Union (OJEU)

An area of discussion on Procurement routes with Heathrow was the application of OJEU regulations on the HEP.

In particular, there remains outstanding clarification on whether the following two packages (both proposed early works in HEP) would require an OJEU process:

1. Immigration Centre (Infrastructure – Enabling – Displaced uses).
2. M25 (Infrastructure – Landside – Motorways).

Heathrow are seeking advice on both packages from their legal team and expect a definitive answer "*in the next few months*". Heathrow were unable to be more specific regarding timeframes. This advice is crucial as Heathrow need accurate options for legally compliant procurement routes going forward.

We would encourage a transparent procurement process to be implemented throughout the HEP and maintain that this issue (OJEU compliance) requires an informed decision at an early stage of the programme. Failure to conduct a transparent procurement process and to make informed and correct decisions regarding procurement routes may leave Heathrow open to a legal challenge during/post the procurement process. This would impact the HEP contract, programme and cost.

Should these two packages be subject to OJEU regulations, Heathrow are confident that they will be able to accommodate the effect for these early works and sizeable procurement events. Arcadis note that Heathrow have been subject to OJEU in the past and their confidence may be justified, however, Heathrow are likely to require additional and/or different skills and resource to accommodate the packages. There is a risk that these events could absorb large amounts of time, resource and cost. Their ability to appropriately react and adapt their procurement activities following

this advice / decision will be important, but at this stage we see no significant reason to challenge their opinion that they will be able to accommodate the impact.

This aspect of OJEU is an additional element of uncertainty associated with the programme and one that is unlikely to be resolved imminently. It is of considerable importance to their preferred contracting and commercial framework, and tender event schedule due to be announced in late 2018.

1.4.9 Alternative Delivery Models; BuildCo

Stakeholders of the HEP, most notably the members of the airline community, have expressed an interest in the establishment of a new organisation (“BuildCo”) which could be responsible for the delivery of the HEP.

Arcadis think this proposal, if pursued, would considerably alter Heathrow’s current strategy; impacting the existing and future organisation and leadership structure for HAL and the HEP.

We think any consideration and decision on this proposal would need to be made at a strategic and business level and include Heathrow Executive Board. Therefore, we see this matter separate from the HEP procurement strategy, and it is not an area we reviewed or assessed in detail.

Nevertheless, during our engagement and review of the procurement strategy, we noted that Heathrow did not provide, and no information reviewed, indicates that they are considering a separate delivery entity for the entire HEP at this time.

The information provided about the HEP structure and other related comments (e.g. seeking to be a ‘hands-on’ client) imply that they are not actively pursuing a ‘full extent’ D&B (e.g. contracting out the delivery of an entire component). While Heathrow have given us no reason to believe they are pursuing this ‘full extent’ D&B deliver model actively, their Innovation Partner process is likely to include contracting out elements of their design at a sub-component level.

2 Introduction

2.1 Background

Arcadis has been appointed by the Civil Aviation Authority (CAA) to provide technical advice in support of their work on capacity expansion at Heathrow Airport.

Historically, the CAA have not scrutinised Heathrow's general procurement strategy and to date have not reviewed the procurement strategy for the Heathrow Expansion Programme (HEP).

However, several factors have initiated the need for increased oversight by the CAA on Heathrow's procurement strategy for the 3rd runway (R3) and the wider HEP. These include:

- The greater scale and complexity of the expansion compared with Heathrow's recent investments; and
- The strong focus placed on affordability and cost efficiency; and
- The risk that a poorly designed or implemented procurement strategy could lead to significantly higher costs for users and/or delays in delivering additional capacity; and
- The wider range of options that might be available for delivering airport expansion (including, for example, proposals put forward by third parties).

The CAA therefore initiated a review and engagement by Arcadis on the HEP procurement strategy and Arcadis commenced the scope of work on 09 April 2018. The Arcadis project charter defining this scope of work as agreed by the CAA and Arcadis is included in Appendix 10.4.

Arcadis' preferred definition of procurement is: *"The act of obtaining or buying goods and services. The process includes preparation and processing of a demand through to the end receipt and approval of payment."* The process of procurement is often part of a company's strategy because the ability to purchase certain materials will determine if operations will continue.

It is important to note that we use 'procurement strategy' to describe a wide range of activities related to procurement, and not limited to the process of placing specific contracts out to tender. It covers: purchasing planning, standards definition, supplier research, decisions on the type and structure of the commercial arrangements, the number and scope of work packages to be tendered, the types of organisation able to carry out these contracts, the extent to which specific risks are shared with contractors, the formal competitive tender process, the way that subsequent changes affect contracts that have already been tendered, and the approach to managing both individual contracts and the interfaces between contractors and stakeholders in the infrastructure delivery market at large. Throughout this document we use 'procurement strategy', to refer to all such approaches.

We also refer to 'Heathrow Airport Limited' (HAL) as simply 'Heathrow' and we use 'The Client' to refer to the Integrated Client Team (ICT).

Arcadis and the CAA agree on the importance of an appropriate procurement strategy to deliver efficiency for the HEP. A robust, well formulated, and properly delivered procurement strategy is fundamental to infrastructure programme success. The procurement strategy has major implications on programme timelines and cost and impacts the quality of the outcomes.

Arcadis appreciate that at present, large parts of the procurement strategy and activities remain at a 'high level' and that several of the documents provided by Heathrow will be revised and amended as the programme develops. It is understood and appreciated that documents, in particular the Overarching Procurement Strategy Document (DG0) and Construction Packaging Strategy, are iterative documents that will evolve as the programme develops, both in terms of its definition but also in terms of their direction.

Heathrow has indicated that the DG0 will be reviewed and updated on a three-monthly basis, if required, to ensure it is current and aligned to developments. Arcadis believe this report is very timely, given the clear emphasis of procurement strategy development and the recent NPS parliamentary vote. HEP leadership have mirrored this view and were welcoming of an external objective assessment and encouraged ongoing engagement and alignment between themselves and the CAA.

2.2 Objectives of this report

The scope of the work completed by Arcadis and objective of this report is; *“To provide the CAA with information about the current state of play in relation to [Heathrow’s] procurement strategy for airport expansion.”*

The CAA have viewed this initial scope of work relating to procurement as fundamentally an information gathering exercise. The CAA aimed for this workstream and report to provide more information about the state of play of Heathrow’s current plans including: whether any specific procurement decisions have been made at present, the timetable for making other key decisions, and whether Heathrow is likely to consider a sufficiently wide range of delivery options.

Arcadis provide this report and seek to offer a point of view on the current Heathrow procurement strategy and associated information, as it currently exists (June 2018). As well as being an initial information gathering exercise, Arcadis also seek to provide commentary on the appropriateness of that procurement strategy, its development to date, and the proposals for further development and activities relating to procurement going forward.

The scope of this workstream and report was defined and agreed as per Project Charter titled ‘Initial Procurement Review’ attached as per Appendix 10.4. Our review has been monitored through ongoing conversations between the CAA and Arcadis and via flash reports.

The objectives as outlined in the Project Charter were as follows:

- To provide CAA with information about the current state of play (e.g. any decisions already made, expected timetable and process for future decision making) in relation to Heathrow’s procurement strategy for airport expansion.
- To advise on whether Heathrow has given, or is likely to give, sufficient consideration to departures from its current approach, including for example alternative commercial arrangements, involvement of different types of organisations, and different approaches to contracting and risk management.
- To the extent that it is too early to answer the previous question, to provide CAA with information on when Heathrow might/should be expected to make the key decisions that will shape its procurement strategy.
- To identify any potential concerns or suggested improvements to Heathrow’s current plans and/or its current ‘direction of travel’ with reference to ‘Best Practice’.

In this report we have refrained from making judgements on whether Heathrow’s strategy is, or is not, deemed ‘Best Practice’. We have not conducted a detailed comparison to industry ‘Best Practice’, as this would require a more rigorous and detailed review and at present the effort and work necessary for it to be a productive exercise does not exist in the HEP.

Arcadis have also not included extensive desk research or benchmarking activity against other programmes or organisations to provide suitable comparisons at this time. We have however, provided commentary on our opinion of the suitability, appropriateness and/or relevance to the information or activities completed and planned by Heathrow in relation to procurement and the wider programme.

The scope of this procurement review is with regards to activities up to and including 2026, which is the date the current Heathrow strategy extends until. This date is the target date for what Heathrow call Expansion Phase 1 of the HEP delivery. Phase 1 includes the majority of their plans for capital and infrastructure works, including a new 3rd runway, a new control tower, construction of a 6th terminal and associated satellite terminal(s), car park expansion as well as required office and services facilities, hotels and commercial venues.

As described above, an objective of the report is to provide commentary on whether *“Heathrow has, or is likely to give, sufficient consideration to departures from its current approach, including for example alternative commercial arrangements, involvement of different types of organisation”*. As these considerations are wide-ranging, for clarity, we have addressed them in different sections which can be summarised as follow:

- Departure from its current approach:
 - Section 4.1 - **Role of the Client**

- Alternative commercial arrangements & involvement of different types of organisation
 - 3rd Party delivery of parts of the HEP – Section 4.4.1 **3rd Party Delivery & Innovation Partners**
 - 3rd Party ('Buildco') delivery of the entire HEP – Section 6.6 - **Alternative Delivery Models**

To avoid confusion on the scope and objectives of the report, we have outlined what is out of scope for this piece of work. This report is not intended to be:

- A detailed, granular review of all possible decision points. As this is primarily an information gathering exercise to give the CAA a point of view, the scope and timeframes do not allow for a detailed analysis of all possible alternatives of their strategy and progress. Arcadis do however, endeavour to summarise Heathrow's approach and provide commentary where necessary for the benefit of the CAA.
- A desk research heavy exercise. The aim of this research was not to rely exclusively on written documentation provided by Heathrow. As explained in section 2.3 of this report, we attempted to use the documentation provided to inform face-to-face discussions, query workshops and more detailed conversation on the plans detailed in the HEP strategy.
- Providing detailed benchmarking against other infrastructure projects. However, we have referred to the approaches taken by other programmes to draw high level comparisons and to assess what may be deemed reasonable.

Providing direct advisory to Heathrow or the HEP. However, there may be points raised in this report which the CAA may wish to forward to Heathrow for the consideration in the HEP.

2.3 How Arcadis conducted the review and structured the report

Arcadis sought to plan and deliver our work in line with the project charter agreed with the CAA and shared with Heathrow. Arcadis also provided a draft workplan detailing our proposed approach.

A summary of the information reviewed and the Arcadis engagement is detailed below. Arcadis utilised a core team to manage the engagement with the CAA and Heathrow and to lead our review. Arcadis also utilised a number of procurement and aviation SMEs to provide insight and support the quality assurance process.

The Arcadis assessment and this report is an "*initial review*" of the procurement strategy of HEP at a set point in time. A further review on the progress of the overall procurement strategy, the relevant components of the strategy and the implementation of plans detailed in this document may be required in the future. Such a review could provide confidence that the programme is developing as desired.

Arcadis have completed an appropriate review of the documentation and information provided by Heathrow in relation to procurement and the HEP required for this scope of work.

A full list of the documents received from Heathrow can be found in Appendix 10.3.

A summation of the key findings from this report has been shared via a presentation given in person by Arcadis to both the airline community and HEP leadership. Feedback, comments and additional information from those engagements have been incorporated into this report where appropriate.

2.3.1 Engagement

Arcadis would like to state that the engagement with Heathrow in completing this scope of work has been extremely productive. Heathrow has provided suitable time, resource, documentation and information.

Arcadis have enjoyed ongoing dialogue through meetings and workshops with Heathrow to obtain relevant information on the HEP. The meetings with Heathrow were constructive and the exchange of information and response to queries have been direct and forthcoming.

The Arcadis framework for engagement to complete our assessment was successfully designed and implemented. It provided a reliable and strong framework for our consultation, information gathering and review and response approach with Heathrow. This framework can be summarised as follows:

- Our initial engagement was an understanding of the technical procurement completed to date. It was a comprehensive sharing of information and process and offered context and insight into the Heathrow plans for procurement going forward on the HEP.
- Arcadis, following this review, confirmed with the CAA that the Heathrow procurement exercises completed to date were not an integral part of this review. However, information from previous procurement events has been included in this report; if that information was deemed relevant to the development of Heathrow's strategy, and/or their plans going forward. Heathrow were keen to ensure this information was shared as they felt it provided background and context to their exercises and ability to deliver a reliable and robust procurement exercise in the future. On evidence from the HEP leadership, Heathrow appears satisfied with the contractors and organisations they have procured to date.

Arcadis has been able to obtain a broad understanding of the HEP and the procurement strategy, allowing us to feel informed about the plans and their appropriateness now and in the future.

Throughout our review, Heathrow were transparent to an appropriate degree about their work completed to date and plans going forward. Heathrow provided suitable access to key stakeholders, including Heathrow Expansion Programme Director. Other senior personnel were made available throughout our engagement and were willing to provide and discuss information relevant to our review.

Our report and information contained thereafter, is based on information provided by Heathrow's programme and procurement team and engagement with the following stakeholders:

- Heathrow Expansion Programme Director
- Heathrow Expansion Commercial Director
- Heathrow Procurement Director
- Heathrow Expansion Procurement Director
- Heathrow Senior Commercial Manager
- Heathrow Senior Commercial Manager
- Regulatory Strategy Manager
- Heathrow Expansion Airline Strategy Director
- Head of Regulatory Strategy

HEP leadership colleagues on numerous occasions have commented on the positive nature of the engagement and are pleased with how the workstream has been conducted by Arcadis.

Arcadis also met with ██████████ of Gardiner & Theobald in his role as a member of Heathrow's Independent Fund Surveyor (IFS). Arcadis shared the nature of our work and some initial views.

██████████ was likewise forthcoming and willing to assist our workstream. We also reviewed information shared by the IFS to gain insight on previous procurement review activities.

2.3.2 Report Structure

This report's structure reflects what we believe are the crucial elements of a well-defined and comprehensive procurement strategy. In each section we have summarised content provided by Heathrow in their procurement collateral as well as further insight from engagement during this workstream. In addition to this, within each section, we have added our commentary on the appropriateness of those elements of the strategy. Where we feel there are areas which Heathrow has not provided information which we deem to be relevant to a procurement strategy we have flagged this. We have summarised our key findings in the executive summary section.

2.4 National Policy Statement and Masterplan

On 5th June 2018 the UK Government published their National Policy Statement (NPS) on increasing airport capacity in the south-east of England. In this, Secretary of State for the Department of Transport, the Rt Hon Chris Grayling MP, set out the proposed backing for the North-West Runway as the preferred scheme for increasing airport capacity.

In the proposed NPS, the UK Government made clear *“Heathrow will be privately financed, and costs will not fall on the taxpayer. To make sure expansion is delivered with consumers’ interests at heart, the government has asked the Civil Aviation Authority to ensure the scheme remains affordable while meeting the needs of passengers.”*

On 25th June, parliament voted in favour of this proposed NPS in the House of Commons by 415 votes to 119 - a majority of 296. Until that point in time, Heathrow had undertaken the Expansion Programme planning under an assumed risk that the government may choose not to support the programme. To that end, Heathrow has made Arcadis aware that while this planning has continued *“no firm commitments would be given to shareholders until a favourable NPS was granted.”*

With the NPS now published and backed, Heathrow should be in a position to begin making clear and definitive commitments to their shareholders regarding the Expansion Programme, which importantly include the finalising of the masterplan.

The NPS makes clear, *“While the Government has decided that a Northwest Runway at Heathrow Airport is its preferred scheme to deliver additional airport this does not limit variations resulting in the final scheme for which development consent is sought.”*

Figure 1 depicts a draft representation of Heathrow’s scheme by 2036. A more detailed graphic as submitted to the Airports Commission (2015) can be found in Appendix 10.1.1

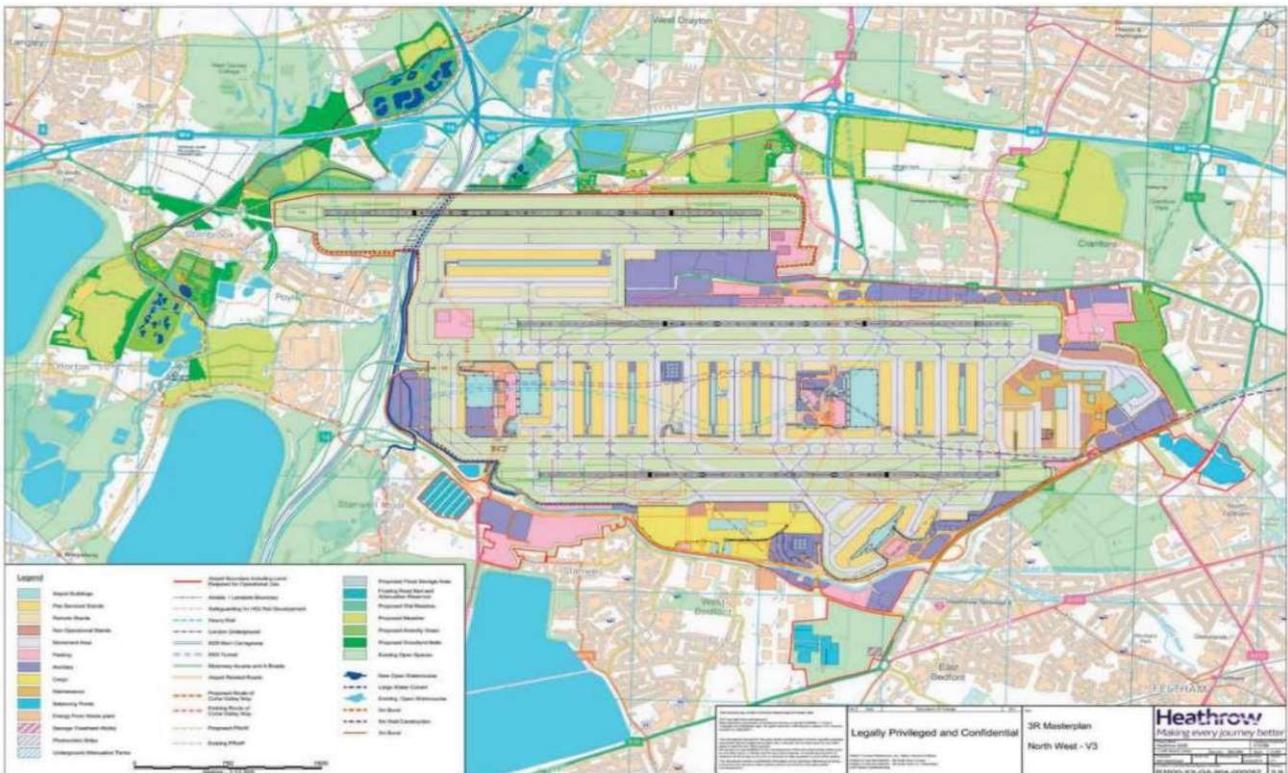


Figure 1- Depiction of HEP by 2036 (TBC)

Heathrow has placed heavy emphasis on the lack of firm commitments of the NPS and determination and announcement of the preferred Masterplan. The importance, influence and their impact on the HEP procurement strategy and development to date has been reiterated in our review. The reasons, whilst obvious, are understood and appreciated by Arcadis and act as a qualification to the commentary provided throughout this report.

In addition, Arcadis recognise that the Masterplan is a critical factor that will inevitably influence the procurement strategy and its relevant elements and the development of procurement plans amongst other areas of the wider HEP. However, in completing this review Arcadis sought to understand to what extent the masterplan development has been shared internally and its influence on the internal procurement strategy

development at Heathrow. Arcadis shared the view with Heathrow that there should be a close, consistent and two-way engagement between those owning and developing the preferred Masterplan and the Heathrow procurement team. The Heathrow procurement team should be close enough to their internal counterparts to plan accordingly with the Masterplan developments as they progress and before they are finalised or more widely and publicly communicated. Arcadis also challenged HEP leadership to articulate the extent to which procurement strategy will be impacted by the details and advanced design disclosures of the masterplan. Heathrow is confident and Arcadis appreciate that while the granular design details will not have major implications on their overarching procurement strategy, there will be impacts on the lower tiers of the packaging structure and the phasing of work. Heathrow acknowledge that there was a frequent dialogue and exchange of information, and that the procurement team was aligned to that of the Masterplan as it has and continues to develop.

3 Business Need and Procurement Scope

In this section, we provide information on the Key Programme drivers, which link Heathrow's Strategic vision, to the development of the Expansion programmes Scope.

3.1 Heathrow Expansion Programme's aims, principles and commitments

Through their strategy documents Heathrow has outlined a number of aims for the Expansion Programme.

Heathrow Expansion Programme Aims:

- Create a world class sustainable hub for passengers, airlines and freight which is a local and national asset with flexibility to grow and adapt into the 21st century.
- Create a business case that allows finance to be raised and is commercially attractive to airline customers.
- Win and maintain the support of politicians, businesses, shareholders, local communities and the wider UK public for the expansion of Heathrow.
- Work as an integrated programme management team that puts winning permission and delivering an expanded Heathrow first.
- Build a skilled, nationwide supply chain that ensures that all of the UK benefits from Heathrow expansion and delivers it safely, on time, on budget and to the right quality.

Heathrow assert any proposals for 3rd party funding and/or delivery must align with the Expansion Programme's vision and strategic objectives which are to:

- Improve passenger experience
- Drive cost efficiency
- Grow commercial revenues
- Deliver sustainability targets

In addition to the Heathrow Expansion Programme aims, Heathrow have provided information of their 'Key HEP Procurement Principles'. These procurement principles are to be adopted for all HEP procurement events.

Key HEP Procurement Principles:

- Robust, fair and transparent approach
- Ethics and value to 'flow down' through the contracts
- Use of Logistics Hubs and Prefabrication / Off-Site Manufacturing
- Enable Small-medium sized Enterprises (SME) to engage
- Optimise value by embracing innovation
- Appropriate allocation of risk

- Recognise market capacity / supply chain capability
- Direct relationships with business-critical suppliers

The procurement principles adopted by Heathrow have been subject to engagement with trade associations, market stakeholders and Small-Medium Enterprises (SME). Heathrow profess the feedback to date on engagements and the subsequent commitments has been very positive.

Further to its procurement principles, Heathrow has made a number of specific commitments to how it will deliver expansion and its social, economic and environmental impacts.

A selection of key commitments provided are set out in Figure 2. A full list of HEP commitments which are deemed to be relevant to supply chain and procurement have been provided in Appendix 10.1.2 of this document.



Figure 2 - Key HEP Procurement commitments

During discussion of these procurement commitments, Heathrow articulated that they would be committed to ensuring all their employees receive the minimum 'London Living Wage'. Support for the Living Wage also appears to be a commitment that will be transferred into the supply chain. Heathrow articulated that they see this commitment being across the HEP and a responsibility for contractors.

Heathrow has articulated that they see a number of the HEP commitments, the principles, and programme aims becoming requirements of the HEP supply chain. Heathrow has not yet articulated how these commitments will be implemented; either through a soft agreement or through ridged contract terms, with the supply chain.

We are yet to understand the mechanism by which a commitment, such as support for the Living Wage (London or nationally), will 'trickle down' the supply chain and the incentivisation and means to monitor commitments will be deployed by Heathrow. Generally, employer commitments are captured through employer requirements at a technical contractor contract level. These commitments can be built into a contract or framework agreement.

It is important for an organisation to create a clear set of commitments. It is equally as important for a client organisation to determine and describe which commitments are required by or passed on to, their supply chain. Further clarity can be provided during a procurement event and within the proposed contract. Heathrow should use the procurement events and proposed contracts to detail how the tenderers/supply chain can demonstrate their ability to meet commitments, with evidence, and how they intend to monitor and scrutinise meeting the commitments set. It is also an opportunity for them to outline how, during programme delivery, they will seek to incentivise, reward or correct the supply chain in failing to meet the commitments.

It may be beneficial for Heathrow to review and assess their commitments with the aim of understanding those that will impose requirements on their supply chain, and the impacts of those requirements. It is likely

that these commitments will have an impact on future procurement events, programme delivery and potential HEP cost.

3.2 Scope and design

As detailed in section 2.2, the temporal scope of the HEP procurement strategy includes activities up to and including 2026, in which time Heathrow is confident they can procure and deliver the majority of the major infrastructure works associated with the Expansion programme.

The HEP is split into 3 major phases as detailed in Figure 3 below:

- Development Consent Order (DCO) Design & Delivery Planning Phase (present – 2021/22)
- Delivery Phase (2021/22 – 2025/26)
- Operational Readiness (2023-onward)

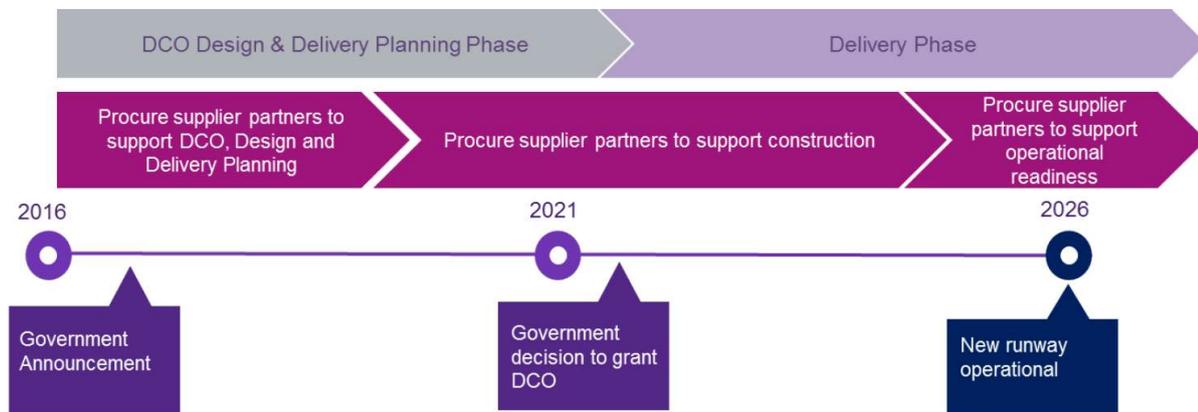


Figure 3 - High-level timeline for HEP

Figure 4 below shows the scope of works required in the DCO, Design and Engineering phase of the programme (Phase 1).

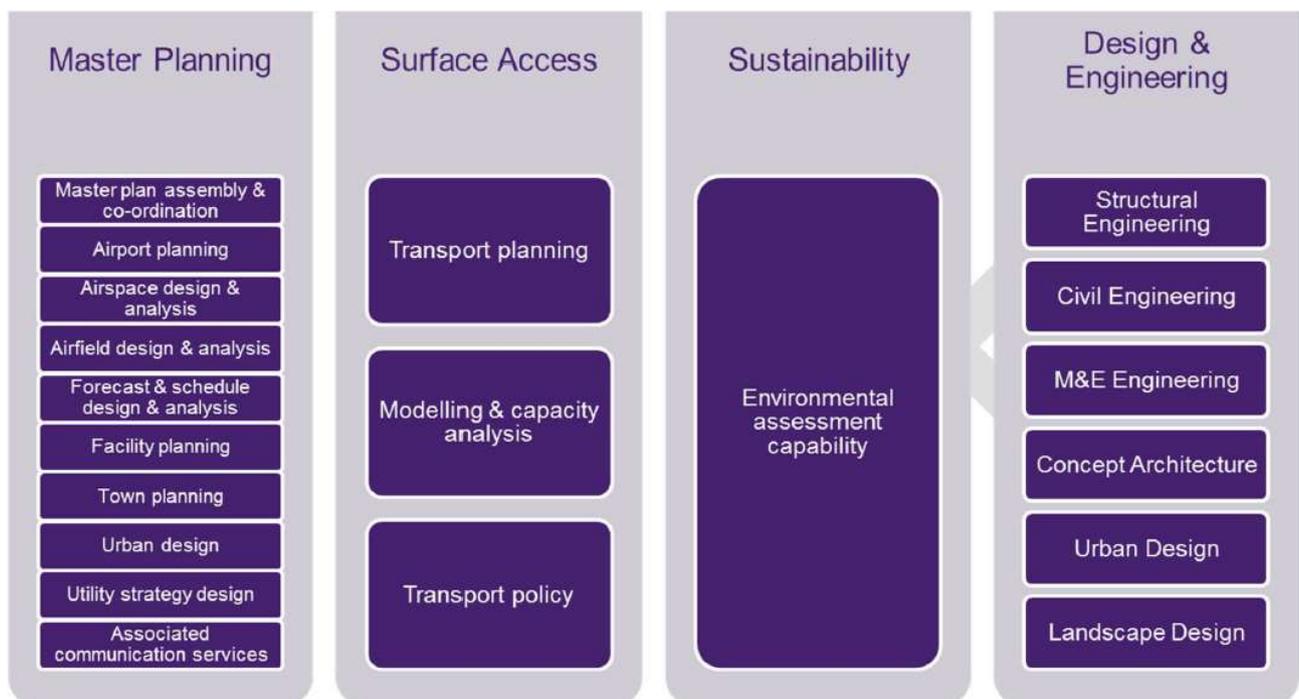


Figure 4 - Required DCO, Design & Engineering Services (phase 1)

Figure 5 below shows the scope of works required in the construction/delivery phase of the HEP (phase 2)

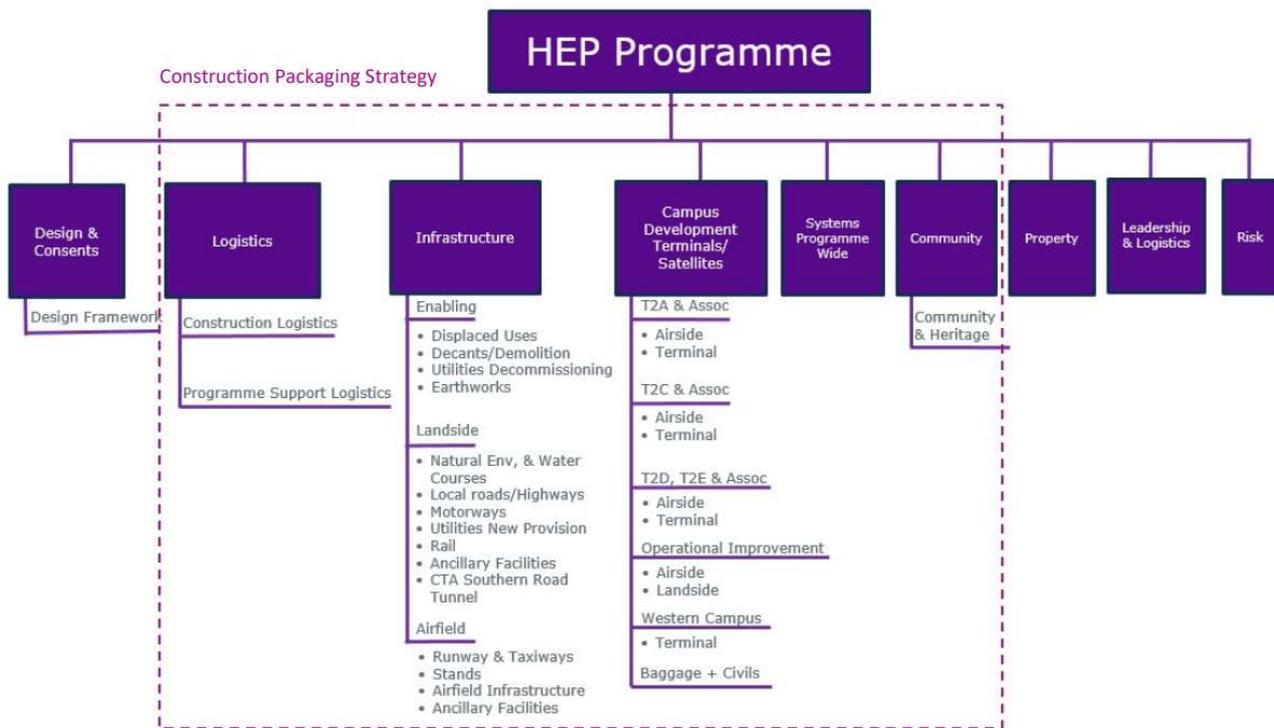


Figure 5 - Required Delivery services (phase 2)

Arcadis are aware of misconceptions that the single preferred masterplan will be one of Heathrow's four 'Assembly Option' proposals and Heathrow has clarified that this is unlikely. Instead, Heathrow has explained the single preferred masterplan is likely to be a combination of the components of all four assembly options. Heathrow is currently going through a process of option analysis on all Masterplan components to make sure they agree on the preferable combination of components. Following this, a weighting and decision-making process will be undertaken to agree a Masterplan which incorporates the most favourable compatible component options into a single preferred Masterplan.

The HEP leadership are comfortable they have emerging preferences for the key components, but a single preferred masterplan does not yet exist. These component preferences may shape the preferred Masterplan which, in turn, impacts procurement planning. The Masterplan and subsequent levels of design granularity directly impact the commercial and procurement teams' ability to develop a packaging strategy for example, and their procurement approach more generally. This process has impacted the current procurement plans of the HEP and supports the qualifications associated with the Masterplan detailed in our review.

Arcadis note that this iterative approach to design will be more time consuming and costly than seeking to 'lock-down' all high-level and more detailed component designs simultaneously. However, we believe this is a pragmatic approach for the HEP. It recognises the fact that components are not independent of each other and that a hierarchy of design decision making exists. Whilst this approach is likely to increase duration and cost of design initially, it should help to mitigate the risk of design clashes later in the programme and at more detailed design stages.

From Arcadis' experience on other large UK infrastructure programmes, design clashes at later stages often have a more significant impact on design and delivery from time, cost and quality perspectives. Arcadis believe therefore this iterative design approach conducted by Heathrow to be reasonable. The process and details on key components are outlined in Heathrow's Scheme Development Report (January 2018). Arcadis have also provided a rigorous review of the key components in our report 'Key Component Green Review' submitted to the CAA in April 2018. Furthermore, this iterative approach to design, and Heathrow's reluctance to depict a preferred masterplan design gives increased credibility to its design consultation process, which Heathrow are keen to demonstrate their commitment to.

Arcadis note there has been significant progress on both the DCO, Design and Delivery Planning phase (phase 1) of the programme, and the Construction Delivery phase (phase 2). However, we are yet to understand the interface between these phases and the relevant stakeholders e.g. lead designers and main contractors or integrators. We would expect these key relationships to be more clearly articulated in the procurement delivery strategy in the future. We would reiterate the importance of close collaboration and a seamless integration of design and procurement and encourage a closer alignment of the design and delivery phase of works going forward.

3.3 Procurement completed to date

To date, there has been several procurement events carried out for the HEP. These have primarily, but not exclusively, been services aimed at ensuring appropriate Expansion Programme planning, readiness and the development of the necessary components of the DCO and Masterplan development.

Previously procured services include:

- Programme Client Partnerships (PCP)
- Integrated Design & DCO Team (IDT)
- Concept architecture
- Ground investigations
- Delivery & review of consultation one
- Demand forecasting
- Land referencing

The scope of this review does not extend to a review of existing procurement events completed by Heathrow or their outcomes. However, where previous procurement events, and their outcomes have, or will substantially affect the development of the HEP procurement strategy, or Heathrow’s plans going forward more generally, Arcadis have endeavoured to provide relevant information relating to their outcomes.

To that end, Arcadis in this report provide information on both the PCP and IDT as Arcadis feel both teams are critical in both strategy development and the effective implementation of that strategy. These are critical, long-term appointments that will influence the performance of the programme. Knowledge of these groups is necessary to understand Heathrow’s procurement approach going forward. Arcadis provide information regarding the nature of the team and its function, but do not provide commentary of the capability or appropriateness of the PCP or IDT organisations. The teams in question are summarised below:

Team	PCP	IDT
Type of Org	Unincorporated alliance, along with Heathrow make up the Integrated Client Team.	Unincorporated alliance
Role	Critical in providing Heathrow the necessary diversity of management and technical capabilities to be an intelligent and well-functioning client.	Responsible for the early stages of design work on Expansion as well as planning and creation of DCO submission and associated works.

Table 1 - Team summaries

We provide further detail on these two key teams in sections 6.2 & 6.3 of this document respectively.

4 Procurement Approach

4.1 Role of the client

A clear theme of the HEP procurement strategy is that Heathrow is very keen to be a ‘hands-on’ client, and along with the PCP Heathrow will create an ICT. Heathrow will contract organisations to help integrate elements of both design and construction, but Heathrow is keen to be very involved in the contracting and

management of the majority of the programme. This is somewhat different approach to that taken on Terminal 2 (T2) and is more closely aligned to that of Terminal 5 (T5) which was similarly 'hands-on'. In 2013/14 Heathrow changed strategy from delivering works on what Heathrow call a transactional basis (using the Complex Build Integrators (CBI) framework), to a location-based strategic approach with the Delivery Integrators (DI).

The Heathrow 'outsource decision' matrix, below, shows where Heathrow see their 'core position' regarding their level of involvement in actively managing the HEP procurement and delivery. This model was used in the decision to bring the PCPs onboard. Heathrow may still outsource packages of works, where the nature of the works means it is more suitably managed by a main contractor or 3rd party. The red line in Figure 6 below indicates Heathrow's expected level of involvement, on average across the programme.



Figure 6 - Heathrow Outsource Decision Matrix

This influences their procurement strategy, procurement engagement models and procurement routes and Arcadis feel this approach, given the circumstances, is a logical decision on behalf of Heathrow. Our experience with other large infrastructure programmes and physical asset management organisations (Utility companies, Water & Sewage Companies (WASCs), Rail Network Operators etc.) has demonstrated the risk of a lack of management capabilities in the supply chain for programmes of such scale. Incentives and behaviours can also become misaligned. Heathrow has experienced this; recognised in their Q6 lessons learned.

Arcadis are aware of instances where asset management clients have had to revert to taking a more involved role in their supply chain to address a lack of performance. This more 'hands-on' approach is championed by the Infrastructure Client Group initiative Project 13. An initiative facilitated by Institute of Civil Engineers (ICE) which we go into more detail on in section 8 of this report. However, key to the success of this approach hinges upon how clear the client is on complexity of, and the timescales for making the necessary decisions, which we discuss in Section 5.1, as well as the appropriate organisational structure discussed in sections 6.1 & 6.2, and governance processes to make those key decisions in appropriate time, which we discuss in section 6.4.

There have been no formal updates to the HEP Overarching Procurement Strategy Document since 2015, however Heathrow has held a number of workshops and engagement forums along with 'Business as usual'(BAU) activities which have been used to progress their strategic plans regarding procurement. Heathrow has shared a non-official, internal draft of this strategy, showing progress in their thinking since 2015, the latest draft of which was updated in May 2018. It is this version which we commentate on in this report. A more detailed schedule is being developed and presented in the internal procurement forums mentioned for challenge and signoff. In particular, Heathrow is now starting the development of the updated Contracting & Commercial Strategy, which makes up part of their Overarching Procurement Strategy. This update is due in Q4 of 2018. The procurement strategy development forums are described in section 9.1.

4.2 Packaging strategy

The packaging approach reviewed in this section is based largely on information provided in the HEP 'Construction Packaging Strategy v.1.1' document (March 2018). Heathrow caveat this document: "Please

note that this document is a working draft and has not gone through any governance". Arcadis have confirmed this draft structure constitutes their latest thinking, regarding packaging structure.

4.2.1 Package structure

Both the Overarching Procurement Strategy and Construction Packaging Strategy give the following high-level programme breakdown into 'sub-programme areas'.

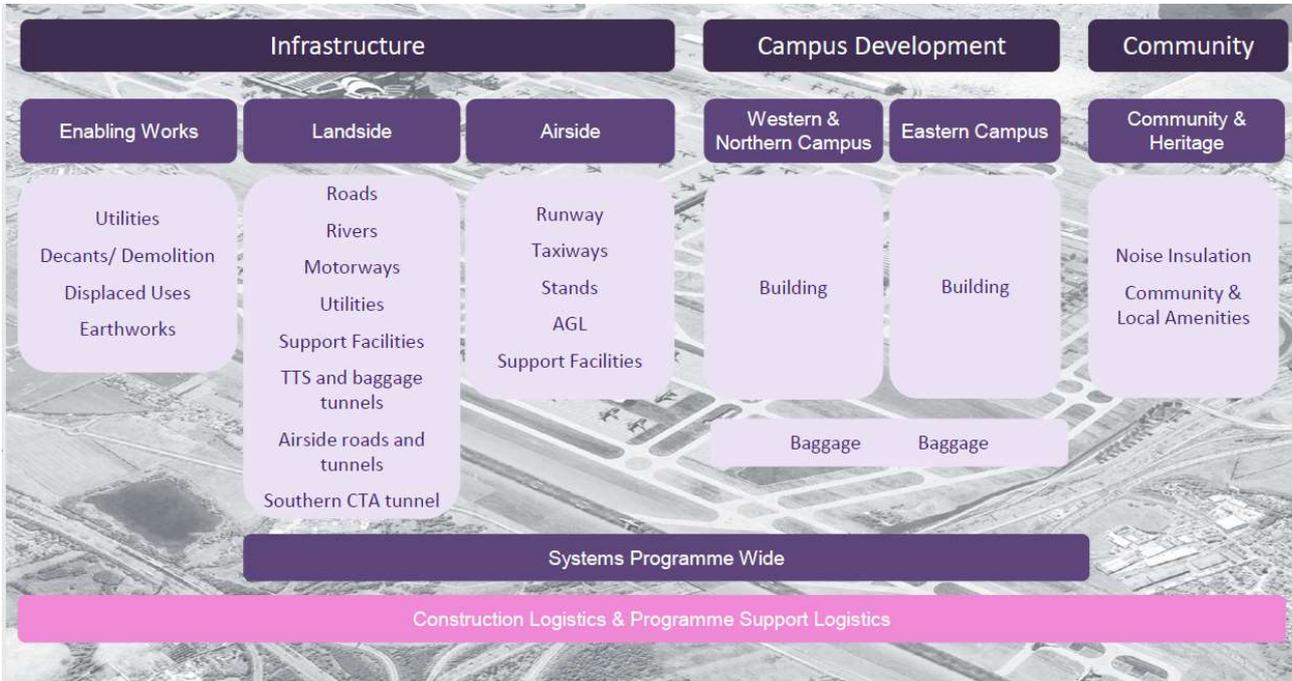


Figure 7- HEP Draft Construction Packaging Structure

The package structure for the HEP has been informed by Heathrow's 'Group Work Breakdown Structure' (GWBS) see Appendix 10.1.3 of this document for details. This 7-tiered framework is the preferred breakdown of all works at Heathrow from a portfolio level to their most granular works. This is treated as a 'baseline' breakdown against which each programme of work is assessed for compatibility and adjustments to the programme works breakdown structure can be made if necessary. Any changes to large programme's breakdown of works can then inform the updating of the 'baseline' GWBS for future use.

Heathrow's GWBS currently in use within the HEP has been detailed to 13 levels of granularity, describing the structure from portfolio level, down to package level. This structure allows for the procurement strategy to be associated to GWBS at the appropriate level giving a flexible packaging strategy ensuring packages are procured efficiently. The GWBS will develop further in line with the maturing of the design. Although we have not seen direct evidence of it, a particularly positive note was to hear about the level of assurance/scrutiny, internally and externally, that Heathrow has given to the packaging strategy of HEP.

This assurance process included the proposed packaging strategy for HEP, including package breakdowns being reviewed and challenged in several workshops and through individual peer reviews by the programme leadership team as well as other technical leads (Head of Design & Infrastructure). In addition, several external workshops have been held with members of the PCP reach-back teams during the development of packaging strategy. This is a good example of Heathrow showing commitment to improving the existing strategy, to strike the right balance and structure, and thus not be held too rigidly to previous models.

When asked about the changes that were made during these iterations, Heathrow has given examples of changes made from earlier drafts including:

- Changing proposed engagement models for certain packages
- Moving packages between sub-projects for improved delivery alignment
- Further development of the chapter contents
- Introduction of additional engagement categories

For clarity, the GWBS is intended to be updated, but this will not happen until Heathrow has reached their preferred masterplan, and the programme's packaging structure is agreed. We have included the Heathrow's preferred package nomenclature in Appendix 10.1.4.

As well as using the GWBS as a baseline structure, the following factors have been considered by Heathrow when developing their packaging structure.

- **Value for money** – the potential for the packages to deliver best value to Heathrow from a capital spend and whole life perspective.
- **Market capacity** – the market appetite for the size and scale of the proposed package and does the package reflect existing market capacity.
- **Phasing for income** – the Packaging Strategy allows Heathrow to meet its target of an operational runway by 2026 and have potential for assets to be completed incrementally and added to the RAB as they're completed.
- **Effective bundling** – packages aiming to take advantage of the synergies, innovations and economies of scale derived from bundling works of similar scope.
- **Interface risks** - the packaging option minimises the risks arising from managing multiple package interfaces where possible.
- **Supply chain capability** in specialist areas such as demolition and earthworks.
- Decision of the scope into **packages best suited to manage the risk**
- **Sub splitting** of the works within the packages, e.g. design approach etc.

Furthermore, when questioned, Heathrow explained that **risk and capability of suppliers** were the most critical driving forces behind the early considerations of their packaging strategy. We believe these considerations warrant being key driving forces and would encourage 'the commercial attractiveness of packages' is also deemed a key driving force. This is due to the buoyancy of the UK infrastructure market, which is by many estimates (including Heathrow's), anticipated to continue for the next 4-6 years. Arcadis would argue attractiveness of client programmes and work packages will become an increasing important driver of value for large programmes.

4.3 Ensuring 'Best Value'

The Heathrow ambition is that *"the correct packages paired with the correct procurement strategy will ensure best value overall."* In this context their 'procurement strategy' refers primarily to two elements:

1. Engagement model: The type of organisation they would prefer to deliver that package (Section 4.4)
2. Procurement route: The method/process through which Heathrow would identify the most appropriate and capable organisation with whom to contract. (section 4.6)

Heathrow should determine what constitutes 'best value', and importantly which stakeholders' value is generated for (e.g. shareholders, Heathrow, HEP, airlines, consumers etc.). Arcadis have not explicitly addressed the definition of 'best value' in this scope of work, however, Heathrow's Expansion Programme Director has stated the aim is to deliver value to the 5 stakeholders' groups of the 'Heathrow's Strategic Brief', those being:

1. Colleagues
2. Passengers
3. Airlines
4. Investors and
5. UK communities & Environment: Local, Regional & National.

Arcadis would recommend a more detailed assessment is completed on how Heathrow defines 'best value', how this value is determined for each of the above and any other stakeholders, how Heathrow will balance 'best value' between stakeholders and how Heathrow will monitor their performance against 'best value' as the HEP progresses.

Airlines have offered one interpretation of 'best value', with their focus being on cost efficiency in the programme. Arcadis have provided the CAA and Heathrow with a report named the 'Integrated Baseline (Purplebook) Review' (March 2018) which provides initial benchmarks on cost efficiency on the HEP. It also utilises a 'Pound-in-the-Ground' analysis which acts as a means and metric for assessing efficiency when delivering infrastructure.

Heathrow has explained that in pursuit of 'best value overall', they have identified their current preferred engagement model for each sub-programme area in their 'Construction Packaging Strategy' document. It is a high-level view and intended to be used to "*guide the development of high-level procurement and contracting strategies*". This approach is appropriate for the programme at this stage.

4.4 Engagement models

In their procurement strategy, Heathrow references five 'Primary Supply Chain Engagement Models'. These are to be understood not as a synonym for 'Procurement routes', or 'routes to market' but as five distinct 'types of organisation' that Heathrow would engage with for delivery of the HEP. In their documentation, Heathrow appears to use 'engagement model', 'delivery model' and 'delivery approach' interchangeably. We refer to 'engagement model' only to avoid confusion.

The five 'Primary Supply Chain Engagement Models' are:

1. **Main contractors (MC)** will manage their supply chain and the contractual relationships. This engagement model is characterised typically by a high number of interfaces in the supply chain and/or relatively low-value sub-tiers.
2. **Technical contractors** provide services, works or materials via their own directly employed workforce and owned key plant and equipment. They traditionally operate at 2nd or 3rd tier in the supply chain. However, where there is the opportunity of obtaining greater value Heathrow may decide to contract directly with these organisations. This engagement model is characterised typically by the organisations high technical capabilities rather than project, programme or contract management (MCs).
3. **Integrators** manage and integrate design and construction on behalf of Heathrow, whilst Heathrow maintains the contractual relationship with the technical contractors. Thus, engagement models 2 & 3 are anticipated to be regularly utilised together.
4. **3rd party funding/delivery** has two elements. '3rd party delivery' will be organisations to whom Heathrow will provide funding, to deliver assets on behalf of the HEP. '3rd party funding' will be where Heathrow simply acquires an asset from an organisation, and thus provides finance for said asset, such as displaced uses on the Heathrow Expansion site. As well as funding, Heathrow will provide stakeholder engagement for both 3rd party funding and delivery.
5. **Utilities** will be utility providers that will undertake decommissions, diversions, realignments and new service provisions.

Figure 8 has been created by Arcadis to depict the default five types of engagement models visually. This has been agreed with Heathrow to ensure accuracy.

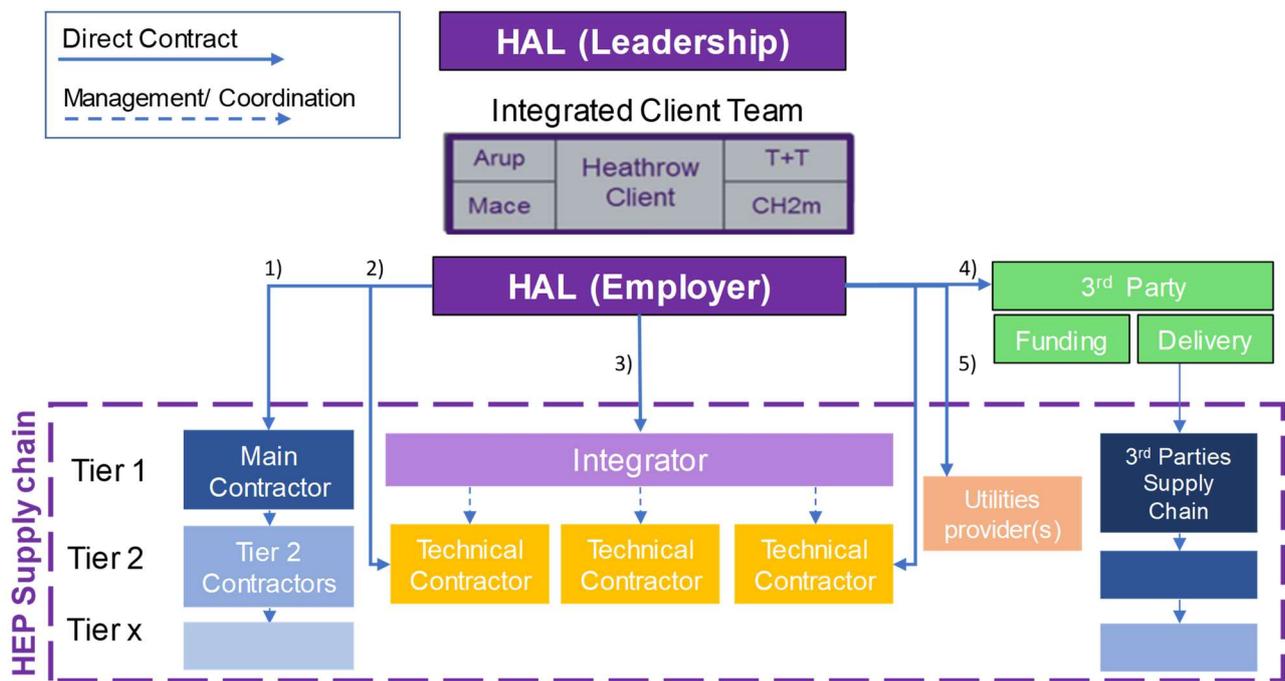


Figure 8 - 5 Primary Engagement Models as depicted by Arcadis

Whilst these five types of engagement models and their depiction are provided as example, Heathrow have explained that:

- They are not bound to these engagement models exclusively and there may be others engagement models proposed in addition to or instead of those described.
- There may be and are likely to be variants of each of these models

As Heathrow maintain they are not bound to these engagement models exclusively, we would be interested to understand the timescales for when Heathrow intends to decide/update/amend their models or define variations of them. This information has not been provided to date. Any variation will produce bespoke commercial and contractual arrangements for each individual package of works which will be critical to procurement and programme success. How each of these engagement models is developed into specific procurement routes will be borne from the Contracting & Commercial, and Procurement Delivery strategies as they become more detailed. Heathrow maintain these strategies are still in their very early stages of development due to a lack of a single preferred Masterplan.

The individual procurement route and contractual arrangement for various packages of work may vary depending on the nature and scope of the works required. This would cause potential variations to one of these five engagement models described.

The benefits of one engagement model over another rely largely on the value that can be derived for the client, based from the allocation of risk (cost, programme, liability etc.) For example, contracts directly with technical contracts implies more risk is being borne by the client. This in turn has the potential to deliver a higher quality and more efficient output if the works information is clearly and appropriately defined, and the contracts and interfaces are managed effectively.

From Arcadis' experience, large management contractor (MC) organisations can struggle to maintain sufficient and quality supply chain management capabilities on programmes of this scale and complexity. As discussed in section 4.1, Arcadis believe it is important for client organisations, such as Heathrow, to be proactively involved in ensuring an appropriate level of contract management capabilities throughout the programme. Heathrow should maintain this appropriate level with their supply chain, including through any MC relationships. Arcadis believe Heathrow is well aware of the importance of this. This is demonstrated by Heathrow Expansion Programme Director's Leadership of the "Capable Owner" Workstream of Project 13. The primary output of this workstream is a Client Maturity assessment tool, which amongst other elements, assesses contract management capabilities within the client, and the client's relationship with their suppliers.

The HEP Construction Packaging Strategy document sets out Heathrow's current preferred engagement model option either at a project level or package level. For the benefit of the CAA, Arcadis have summarised the preferred engagement models per project/package along with Heathrow's reasoning in Appendix 10.1.5.

Arcadis notes preferred engagement models for four sub-programme areas are not included in the current version of the packaging strategy document, namely; Design, Property, Leadership & Logistics, and Risk. These are four non-construction sub-programmes and thus outside the scope of the construction packaging strategy. At present, efforts to agree construction package breakdowns and subsequent engagement models have been given a priority. Heathrow have explained that these non-construction sub-programme areas are yet to be proposed due to the need for integration between design services and the construction packages once a single preferred Masterplan has been created.

4.4.1 3rd Party Delivery & Innovation Partners

Arcadis are keen to provide clarity over multiple terminologies being used by various stakeholders to describe the delivery models of the HEP. In section 4.4 we have explained Heathrow's primary engagement models. One of primary engagement models is 3rd party funding/delivery. '3rd party delivery' is described as organisations to whom Heathrow will provide funding, to deliver assets on behalf of the HEP. Heathrow state examples of works delivered under a 3rd party delivery engagement model may include the Traffic Management services associated with the M25 relocation.

'3rd party funding' will be where Heathrow simply acquires an asset, or access to/use of an asset from an organisation/individual and thus provides finance for said asset. Heathrow offered examples of 3rd party funding engagement model and these may include displaced uses on site, various surface access assets and/or community facilities.

For the HEP, Heathrow use the term 'Innovation Partners' for such 3rd party relationships when interacting with the market. Innovation Partners in this sense can be understood as a sub-group of Heathrow's 3rd party funding/delivery engagement model.

On the back of the publication of the NPS (5th June), Heathrow is now inviting proposals from Innovation partners who could *"help make [Heathrow] the most successful hub airport in the world in a way that is sustainable, affordable and financeable"*. All interested parties were requested to register their intent to submit an Expression of Interest (EOI) by noon on 15 June 2018. The submission deadline for the Expression of Interest is noon on 27 June 2018.

To entice as diverse a range of responses as possible, Heathrow have deliberately been non-prescriptive about what types of proposals they welcome, although they do mention innovations may include: alternative design, engineering or construction approaches for parts of the Masterplan. The HEP leadership made clear to Arcadis that they are open to this approach in principle and are welcoming to all proposals. Arcadis have not sought to understand whether Heathrow are entertaining proposals for models which go beyond delivery (for example to include proposals for delivery and operation of assets). However, information given on their website indicates they are not open to proposals for a new airport operator (*see quote below*). It should also be noted, Heathrow does not invite proposals for new Masterplans. While the NPS does leave room for iterations and developments in the design of the site, an entirely new Masterplan design, including anything which differs from the specified North-West runway location may void the NPS. Heathrow also include a number of clarifications on what constitutes a compliant proposal, as detailed below.

"Proposals must align with Heathrow's strategic objectives and regulatory and planning constraints. They should also align with the Government's National Policy Statement and support the efficiency of a single integrated hub airport in the interests of consumers (i.e. Heathrow will continue to own and operate the hub airport as a single entity)

We are committed to a collaborative process and welcome all proposals that will align with our strategic objectives to improve passenger experience, drive cost efficiency, grow commercial revenues and deliver sustainability targets."

Further to a review of EOIs, Heathrow will then be actively involved in the development of suitable proposals into potential business cases and the presentation of proposals for further consideration and joint development.

Initiatives such as the Innovation Partners invitation have been well-founded and potentially very beneficial elements of many major infrastructure projects. However, the specific scope and likely impacts for the HEP are far from being understood, and so it is too early to provide any detailed commentary.

Arcadis would like to add a note of caution on the pursuit of innovation in the supply chain which is not specifically related to information shared by Heathrow but more general to the construction industry. While clients of infrastructure programmes often look to large MC organisations to drive efficiencies through innovation, in reality, large amounts of innovation often come from lower tiers of the supply chain or through what is increasingly referred to as 'ecosystem partners'. In these circumstances, MC organisations can realise benefits from innovations in the supply chain, but the commercial model may not appropriately incentivise those efficiencies to be shared with the client.

Therefore, Arcadis encourage mechanisms that spur innovation to be closely aligned with appropriate incentivisation models (financial and non-financial) and to ensure the resulting efficiencies are shared with the client. Furthermore, a programme which constantly pressures timeframes can act to stifle innovation within the supply chain. An overly simplistic focus of getting the required works done on time and relying upon 'tried and tested' approaches can be the result. A fertile environment for innovation strikes a balance between incentivisation and freedom to try new approaches.

4.4.2 Supply chain engagement bandings

One of the impacts of the different proposed packaging structures is on the level of direct engagement required by Heathrow's Client Team. To provide further clarity of these impacts, Heathrow have proposed the following 'engagement.

Banding of levels of Heathrow Engagement

- Level 1: Funding and Stakeholder Engagement
- Level 2: Client PM and Contract Management of Main Contractor Arrangements
- Level 3: Client PM and Direct Contract Management of Technical Contractors
- Level 4: Delivery PM oversight (Including Interface Management) and full Direct Contract Management

While none of the above are unusual, the exercise does show Heathrow is considering and begin to document the ways they will interact with their supply chain against various engagement models once contractors have been procured.

4.5 Supply chain criticality framework

Heathrow have shown greater considerations to engagement models than procurement routes. Heathrow have considered their engagement models, package structuring, and works criticality in appropriate detail. Our view is the Overarching Procurement strategy is currently missing an appropriate supply chain feasibility study. Such a study is an important element in in developing a fully integrated procurement strategy. The market segmentation analysis detailed in **Error! Reference source not found.** shows the beginning of this activity. This exercise, described in Heathrow's packaging strategy, was intended to be the basis for the future development of individual package-specific strategies and implementation.



Heathrow intends that this market segmentation exercise will be developed further against the programme timelines following the release of the preferred Masterplan. From our experience, this is vital as it shapes the critical path and allows Heathrow to understand the time and scheduling of the procurement packages of the HEP and to determine their preferred procurement routes. We believe this activity is a suitable start and will provide a framework for decision making for Heathrow's preferred procurement routes in the future. We would expect this type of analysis to continue to evolve and to be refined.

4.6 Procurement routes

To reiterate the distinction:

1. Engagement model: The type of organisation they would prefer to deliver that package (Section 4.4)
2. Procurement route: The method/process through which Heathrow would identify the most appropriate and capable organisation with whom to contract.

Heathrow have invested time to understand the most appropriate engagement models for various packages, but less time has been invested to investigate the appropriate procurement routes for those packages.

In meetings with Arcadis, Heathrow briefly spoke of potential procurement routes for isolated sub-programme areas, such as an ambition to utilise the suppliers on major Highways England frameworks for the package(s) to relocate the M25 and associated infrastructure. As shown in Appendix 10.1.5 this is likely to be delivered through a MC relationship with a potential for 3rd party funding for some interfaces with existing assets. We would encourage Heathrow to more proactively consider their preferred procurement route this particularly complex package.

Apart from these isolated examples, Heathrow is of the opinion that at this stage in the programme further analysis on procurement routes would be premature given the lack of a single preferred Masterplan. Heathrow expect to clarify preferred procurement route in their 'Delivery Procurement Strategy'. This document can be expected in late Q3 – early Q4 of 2018.

Heathrow appreciate political factors may need to be considered in their procurement approach to certain packages, for example the politically sensitive nature and procurement of steel. They are also considering their procurement routes against 'off/on-site manufacturing/assembly' options. As well as cost considerations, these will largely depend on the user requirements, technical design and buildability/logistics concerns of these options.

4.6.1 Design and build procurement route

An area of interest for the CAA through this workstream was whether Heathrow has given, or is likely to give, sufficient consideration to a terminal 'design & build' (D&B) approach.

The design & build procurement route typical has 2 main variations, although others do exist.

- One-stage design and build contract (with Employer's Requirements defined at RIBA Stage 3)
- Two-stage design and build contract (with Employer's Requirements defined at RIBA Stage 4)

The HEP is currently between RIBA (Royal Institute of British Architects) stages 1 and 2 as evidenced by the necessary objectives of each stage.

Stage 1 Core objectives:

- Develop project objectives, including quality objectives and project outcomes, sustainability aspirations, project budget, other parameters or constraints.
- Develop Initial project brief.
- Undertake feasibility studies and review of site information.

All of which the HEP have done to a greater of lesser extent.

Stage 2 Core objectives:

- Prepare concept design, including outline proposals for structural design, building services systems, outline specifications and preliminary Cost Information.
- Develop relevant project strategies in accordance with design programme.
- Agree alterations to brief and issue final project brief.

None of which the HEP have completed yet, although they have procured their preferred concept architect and are currently working with Grimshaw's' to agree a concept design.

Although Heathrow have not yet definitively stated the preferred procurement routes of work packages for the HEP, we currently understand some will involve some form of D&B contract. Previous examples from Heathrow, and across the aviation industry in the UK and Europe, suggests that D&B is the preferred option. For example, Lang O'Rourke are working on a D&B contract in Manchester Airport for a £600m package, of a programme value of £1.2bn. The information provided about the HEP structure and other related comments (e.g. seeking to be a 'hands-on' client) imply that they have ruled out a 'full extent' D&B. A 'full extent D&B' would include contracting out the entire terminal, or the entire surface access infrastructure for example, from concept design right through to delivery, all as a single contract. Heathrow have given us no reason to believe they are perusing this 'full extent' D&B deliver model actively, but their Innovation Partner process may include contracting out elements of their design at a sub-component level. Therefore, we believe Heathrow will likely go out to tender with a D&B contract after RIBA stage 3. That said, RIBA stage considerations and variations are dependent upon the development of the packages, and the release of the preferred Masterplan.

Heathrow has been clear with Arcadis that no individual procurement routes have been discounted at this stage in the programme. Given this, there is still sufficient time for considerations for either of the procurement routes described above. Heathrow is still considering D&B contracting options for the technical design and build of terminals and satellites, along with other packages of work. Arcadis notes, for either of these procurement routes to be employed effectively it is of critical importance to ensure adequate time and

details have been afforded to the definition of the employer/user requirements. The clear articulation of the necessary interfaces between existing infrastructure and the new infrastructure to be designed is also recommended. While this is not seen as a major programme risk by Arcadis at this time, we would encourage Heathrow to clearly define their expected timelines for the development of such requirements to avoid any procurement routes being discounted based on a lack of adequate planning time period.

4.6.2 OJEU requirements

There remains outstanding clarification on whether parts of the HEP are subject to Public Contracts Regulations and thus procurement would require an OJEU process.

In Heathrow's opinion the two packages in question are:

1. **Immigration Centre** (Infrastructure – Enabling – Displaced uses).
 - Due to the fact the asset is under the ownership of HM Department of the Home Office (Home Office).
 - The Home Office believe Heathrow will be subject to OJEU regulations for this package.
2. **M25** (Infrastructure – Landside – Motorways).
 - Due to the fact this is under the operational jurisdiction of Highways England.
 - Heathrow have not received an indication of Highways England view for this package. However, Heathrow is treating this package in a similar way to the Immigration Centre for what they say is their own risk assessment.

Heathrow has a legal team reviewing both packages. Heathrow is treating both assets equally and subject to appropriate scrutiny, to minimise risk. Heathrow wishes to ensure their legal team provide accurate options for legally compliant procurement routes, after which Heathrow can assess and plan their preferred route of engagement.

Arcadis requested further clarification and impact of OJEU requirements on these packages and the wider procurement and HEP programme. Heathrow has maintained their legal team are addressing the issue currently and expect a definitive answer *“in the next few months”*. Heathrow were unable to be more specific regarding timeframes. An early indication on this issue suggests Heathrow believe they will not be subject to OJEU regulation due to activities in question being included in the formal application for DCO. This, however, is speculation and has not been confirmed by their legal team.

We would encourage a transparent procurement process to be implemented throughout the HEP and maintain that this issue (OJEU compliance) requires an informed decision at an early stage of the programme. Failure to conduct a transparent procurement process and to make informed and correct decisions regarding procurement routes may leave Heathrow open to a legal challenge during/post the procurement process.

Heathrow may require additional and/or different skills and resource to accommodate the packages. There is a risk that these events could absorb large amounts of time, resource and cost. Given the sensitive political and stakeholder environment of both assets Heathrow should be mindful of this risk.

Heathrow is confident that they will be able to accommodate the impact should OJEU be applicable for these early works and sizeable procurement events. It is worth noting that Heathrow have been subject to OJEU in the past and their confidence in dealing with such procurement events may be justified. Heathrow have also shared that their current and future procurement processes, although not strictly following OJEU, are principally aligned and have been rigorously tested and developed.

Arcadis note that one of the stated HEP procurement principles is to utilise a (predominantly) British supply chain. This has been reinforced by statements given by Heathrow Chief Executive John Holland-Kaye when speaking to members of the Chartered Institute for Procurement & Supply (CIPS), saying *“while the economic implications of Brexit helped secure parliamentary approval for airport expansion, it had not had a major impact on how the supply chain for the third runway was being structured. “[Heathrow is] not bound by OJEU rules so we can have a predominantly British supply chain”*. He added the airport would also *“play our part in promoting the British supply chain internationally.”* Should OJEU compliance be required for the package(s) in question then Heathrow will need to revisit this procurement principle for these package(s), or alternatively detail how they plan to deviate from OJEU to suit their preferred procurement approach.

Should these two packages not be subject to OJEU, the question remains as to the most appropriate procurement route for packages of this size, scale, complexity and political sensitivity. Heathrow need to ensure sufficient, competitive commercial tension for these works as they will be significant to the programme. Heathrow have not speculated and await clarity, but this will be of considerable importance as their preferred contracting & commercial framework and tender event schedule is announced in 2018.

This aspect of OJEU is an additional element of uncertainty associated with the programme but one that is not likely to be resolved imminently.

4.7 Selection process

Heathrow will use its existing 10-point selection criteria to select suppliers for the HEP. The criteria are:

1. Delivery Methodology
2. Resources
3. Behaviours
4. Innovation
5. Information Management
6. Quality Management
7. Risk & Value Management
8. Health & Safety
9. Sustainability
10. Commercial

Other potential criteria which do not appear on this list but Arcadis believe could be useful to identify appropriate suppliers may include:

- The quality of that supplier's own supply chain relationships and the ways in which is contracts with lower tiers
- Reference to the customers or customer experience through both the design, and impact on Heathrow's BAU customers during HEP delivery

On the contrary, Arcadis understand a balance needs to be struck when assessing suppliers to meet client and programme needs, and supply chain capability. This balance should be struck for the benefit of a time and cost-effective selection process as well as for increasing the attractiveness of procurement events.

The simplicity of a procurement process is one of the levers a client can use to improve their attractiveness in the market. It is also important to be clear with the differences in selection criteria between pre-qualification and tendering. Good practice suggests that the pre-qualification stage should be backward looking and focus on the supplier. The tender is forward looking and should focus on the project, and the supplier's ability to deliver the needs of the project.

Our experience across the Arcadis business and in the infrastructure construction market notes the current tendency for clients to develop a robust and challenging PQQ document/process to ensure down-selection is effective. This enables the client to subsequently tailor the ITN to project specifics. Arcadis are aware from previous Heathrow procurements that Heathrow have very exacting requirements to allow for the demonstration of supplier capability and outcomes. Therefore, we believe that the likely robustness of supplier selection does not warrant concern at this time.

Heathrow states the criteria will be further developed, and different weightings applied to appropriate criteria on a contract by contract basis. This will be determined by the nature of the goods and services being sourced in the specific procurement event. Heathrow's selection criteria will be confirmed in the Delivery Procurement Strategy, which is estimated for completion in September 2018. Heathrow is aiming to release a tender event schedule by the end of 2018 and will then add details of timescales to their packaging strategy.

5 Procurement Programme

5.1 The HEP procurement timeline and key milestones

As noted, the HEP is split into 3 major phases:

- Development Consent Order (DCO) Design & Delivery Planning Phase (present – 2021/22)
- Delivery Phase (2021/22 – 2025/26)
- Operational Readiness (2023 – onward)

The HEP procurement timelines have been produced by backwards analysis from the target opening date of R3 (2026). This includes the timescales expected to plan and implement procurement activities, whilst building resilience and flexibility into their estimated timeframes where feasible.

The timeframes for the HEP articulated to Arcadis during this review are by no means specific or fixed, and often came with strong caveats and conditions. Given the uncertainty over the NPS until very recently, and the ongoing evolution of a preferred Masterplan this 'conditional drafting' of timelines is appropriate. Our view is that Heathrow appears to have considered the most pressing elements of their procurement programme built around their delivery plan.

The positive NPS announcement should now encourage more conviction to timeline estimates and full support for the Northwest runway at Heathrow in the NPS, only builds the urgency in which Heathrow should be expected to detail their timelines.

Heathrow has begun and continues to develop their procurement strategy and timeline for the Heathrow Expansion Programme, from delivery consent and planning phase through to handover back to BAU operation. Large parts of this also remain at a high-level at this stage.

While Arcadis feel the most important elements are being considered, and while we would not expect Heathrow to have confirmed detailed procurement timelines at this point in the programme, it is our opinion that the HEP procurement timeline and maturity is still at more of a 'high-level' than could have been achieved. We would have expected to see a firm estimate of procurement milestones for both the strategy development and the procurement events themselves. Plans are underway to develop these timelines and the associated detail. The Heathrow commercial team appear to be actively updating this information. It is our view that a more detailed HEP procurement plan will be needed in the near future (3 – 6 months).

The most granular timeline for the development and updating of their procurement we are aware of is shown in Figure 10.



In addition to the above, through conversations with the HEP leadership team the following high-level timelines were articulated to Arcadis for the development of the strategy and key programme milestones:

- Single preferred Masterplan (M4) expected by Q4 of 2018 (including scope, cost & time)
- Logistics Hub Strategy (Q3-Q4 2018)
- Contracting & Commercial Framework (Q4 2018)
- High-level Delivery Model (End of 2018)
- Tender event schedule to be released (End of 2018)
- Heathrow aims to start most of their procurement activity in 2019.
- DCO (second) consultation (Q1 2019)
- Contracting & Commercial Strategy (Q1-Q2 2019)
- DCO application (Q1 2020)
- DCO consent to be granted (Q3 2021)
- Construction to commence ASAP after planning permission granted
- Heathrow aim to begin main construction works (early 2022)

When cross-referenced with the timelines given in their strategy papers the timelines listed above, albeit given at a very high-level (by quarter year), align to their documented procurement programme, with the exception of M4 gateway moving from Q3 2018 to Q4 2018.

The NPS (issued 5th June) will have major implications for the timescales for delivery of the HEP. Heathrow's view is that if the NPS was not granted prior to parliament summer recess, it would constitute a significant risk for the current timeline and any proposed development.

In discussions with Arcadis, HEP leadership articulated that should a favourable NPS be issued prior to end of Q3 2018 (as we now know it was) then they would be confident the programme could still be delivered against their existing timeline (as described above) with minimal impact.

With regards to procurement, 2019 will present the first opportunity to procure various contracts associated with the delivery of HEP. Therefore, 2018 is about HEP readiness and ensuring market readiness. 2019 will be a critical year for the HEP in general, as it is the first calendar year where the programme has significant delivery commitments, which are likely to get public and stakeholder attention.

Heathrow's Expansion Programme Director estimated a good 'rule of thumb' for procurement is to be engaging with the supply chain approximately 2 years prior to the actual construction of any given package. From experience on advising large infrastructure delivery programmes, Arcadis feels that as general principle this timeframe is appropriate. Therefore, it is critical that stakeholder and market engagement is continued and increased throughout the remainder of 2018 to ensure the HEP attracts, hires, onboards, upskills and retains key members of staff for procurement and to ensure a successful 2019 and beyond.

In the process of prioritising procurement events to shorten the total procurement programme, Heathrow have identified a number of 'early works' which are:

- M25 relocation and associated junctions,
- Immigration centre,
- Local roads(A3044),
- Rivers,
- Earthworks,
- Southern Access tunnel.

'Early works' are not construction activities per se, but instead are the procurement events which Heathrow propose begin earliest in the HEP programme to allow their subsequent construction packages/projects to take place.

To summarise, as noted we would have hoped to have seen more detail, and a breakdown of the procurement programme and clarity around an emerging, high-level critical path which we have seen little evidence of. Arcadis have reviewed a very high-level timeline of early construction works procurement, discussed in more detail below. Development of the procurement timeline for early construction works and for other key components will need to be detailed and evidenced soon after the M4 gateway (Masterplan). We have not been able to review a full line of sight on this at present and there is no clear visibility as to their packaging strategy. Heathrow have reiterated and emphasised that this is due to the ongoing development of their Masterplan. We believe Heathrow should be more proactively considering their engagement model and preferred routes to market for these early works, especially those which will present a particularly complex challenge for the programme, notably the M25. This is due to the asset size, scale, complexity and the stakeholder influence.

5.2 Critical path and programme risks

Heathrow appears to be focused on early works and setting the supply chain up correctly for these activities. Heathrow timelines estimate the commencement of procurement activities for construction work packages (early works) in approximately July – August 2019. At this time Heathrow will need to be in a position to give commitment to the market on their procurement route.

Given the Programme Director's target for a two-year procurement lead time, procurement activities for a targeted construction start date of late Q4 2021 – early 2022 for early works means that procurement activities must commence prior to the start of 2020. Therefore, the commitment on preferred procurement routes and subsequent market engagement for these early works may be on the critical path if the commencement of procurement activities slips from July – August 2019 to Q4 of 2019.

Between now and July 2019, time will be devoted to the development of both the overarching strategy DG0 and the package Sourcing Strategies (DG1). This will involve the clarification of scope through detailed design activities and market engagement.

Heathrow had built flexibility into the HEP and procurement strategy to accommodate the uncertainty of HEP. This uncertainty should now be significantly reduced post NPS, and Heathrow will be responsible and accountable for the development and delivery of their own scheduled plan, including that of procurement.

Heathrow have also stated, and Arcadis agree, that flexibility is required to allow for potential changes brought about by the second consultation period.

It is noted that 3 of the 6 'early works' described by Heathrow are 'key components'. The key components are design components pivotal to the Masterplan and represent significant cost. These 3 early works present the first challenges for the Heathrow programme and a valuable test to the resilience of their plans. It offers Heathrow little opportunity to learn from their early procurement events and to steadily build the necessary capability. We would recommend learnings from agile project planning are built into their procurement plan and wider programme. Heathrow should be continuously reviewing, learning and incorporating feedback into HEP to ensure valuable lessons are not lost. Heathrow should also be taking the opportunity to incorporate learnings from their previous major projects (e.g. T2 and T5) and from other major infrastructure programmes (cross-sector) now.

6 Operating model

As described in section 4.1, Heathrow is keen to be a 'hands on' client. To facilitate this approach, Heathrow must not only ensure a well-functioning leadership structure, but also an efficient team with sufficient capability and capacity to deliver this complex programme.

To help shape their thinking around their required organisation, Heathrow has defined some organisational design principles shown in Figure 9.



Figure 9 - HEP's Organisational Design Principles

6.1 Delivery team structure and capability

Figure 10 shows the current HEP organisational structure as articulated to Arcadis.

This organisation design is not currently evidenced in any documentation we have received or reviewed.

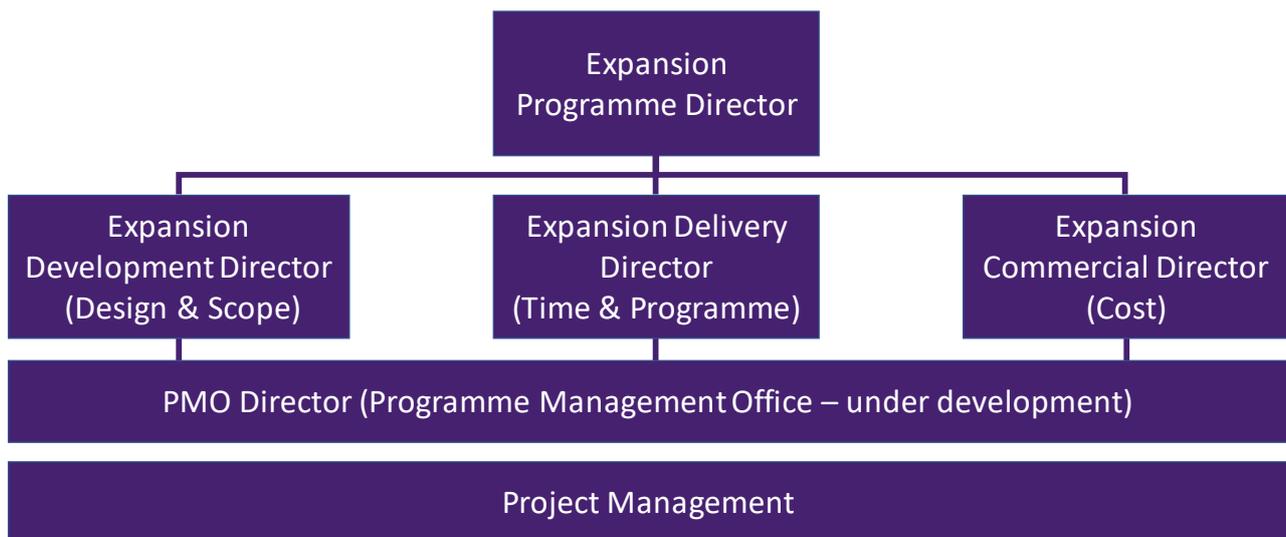


Figure 10 - Current HEP organisational design

Arcadis believes there is a now a critical action required to begin to build a capable team for procurement and delivery. Arcadis believe this will be a pivotal element in delivering an efficient Procurement programme. Heathrow profess the procurement team structure for delivery is still under development, and influences will include preferred Masterplan (M4 expected Q4 2018), delivery procurement strategy (expected Q4 2018), delivery model (expected Q4 2018) and other interfacing strategies. Not having the right people, in place, in time poses a risk to the timeline and quality of the procurement packages.

A key issue noted by Arcadis is the majority of work required of the HEP procurement team will be the drafting, authoring, and development proposed contracts. Our knowledge and experience highlights that this process is frequently underestimated on large aviation projects. This can result in commercial and programme overruns or delays engaging the market.

6.1.1 Resourcing a new HEP procurement team

Building the contracts and procurement team should be aligned to the timescales of the physical works and required design input of the HEP. Much of the evidence received from Heathrow suggests this will only start in earnest after the preferred Masterplan is released.

The HEP have identified 4 main sources of procurement resources:

1. Recruitment: Heathrow is actively recruiting procurement talent. They estimate that the majority of their 'in-house' HEP procurement team to be in place by then end of 2018 / early 2019. Arcadis note that while recruitment may build the procurement team to sufficient numbers, the onboarding and capability development for a programme of this size cannot be underestimated.
2. Business as usual (BAU) Procurement function: Heathrow have suggested that the HEP may utilise current BAU procurement resource. Arcadis note the risk this may pose to ongoing BAU procurement activity and capability and the difference in skillset for BAU events and events associated to the HEP.
3. PCPs: Heathrow is aware they are unlikely to possess or recruit all the skills required for a high-performing client organisation. It is their intention for the HEP Commercial Team including procurement to secure additional resources from the PCPs. Arcadis note this is a viable alternative route for appropriate expertise to be secured from the organisations.
4. Agency: Heathrow have also appointed 'Guidant' as an outsourcing provider / broker that offers access to a further "23 resource augmentation companies", if short term resources or specialist resources are required. Arcadis agrees this provides a 'buffer' for resource further resourcing resilience. However, it is often a costly option and should only be utilised in isolated instances of unexpected peak procurement activities.

Arcadis believe it is important to recognise both the need for suitable numbers and appropriate quality for both the technical delivery capabilities, and leadership and management resources. The HEP leadership seem are acutely aware of the need to meet both for these roles but are confident they will be able to present appealing opportunities to the labour market and receive adequate numbers and applicants.

Heathrow considers itself and the HEP to be an attractive organisation and programme respectively. One such view is that Heathrow benefits from the longevity of the programme itself as well as the ongoing and planned BAU projects they offer before, during and beyond the HEP. This gives resources assurance of continuity of employment and in our opinion, is a valid point of view. This is also helped by Heathrow's brand power and its maturity as a client organisation.

However, for a programme of this size and given current HEP organisation structure, adequate resourcing and development will take time. Heathrow should closely monitor progress and associated cost.

To mitigate against the impacts on the scheme due to inadequate resources, Heathrow have outlined in their DG0 procurement strategy document the following:

"Heathrow must ensure appropriate planning is made in order to mitigate against [resourcing] pressures."
Such plans could include:

- Training and development of skilled resources
- Consideration of purchase rather than hire key items of plant
- Integrated planning with our supply chain and other infrastructure clients
- Constructability reviews to identify alternative methodologies
- Purchase of the resources in an alternative manner e.g. 'Buy Club'

Heathrow has indicated that they believe the HEP to be a timely programme because other major projects, such as Crossrail, will be winding down. However, the UK Infrastructure Spend profile (Appendix 10.1.6) indicates that many other large construction projects, such as HS2 and Hinkley Point C, will be scaling up in the same period as the HEP. Arcadis note that there is the potential for such projects or other competition, to impact the overall labour market and Heathrow's ability to recruit. This is in addition to the potential loss of access to European labour pools as a result of Brexit. The Arcadis Talent Scale report suggests there will be strong demand of commercial professionals, especially in London and the South-East (e.g. more than 1,500 new QSs are required every year). There will also be an average annual increase in commercial salaries of ~4% (compared to ~3% for all professionals), due in part to the fact that average infrastructure construction output is expected to grow by approximately 8% per annum between 2017 and 2021. Heathrow should be mindful of such predictions and other examples shared in the market. We would hope that Heathrow consult/utilise suitable professionals (internally or externally) and cross-market experts for insight and means for mitigation and preparation.

6.2 HEP Programme Client Partners (PCP)

This section contains information that Heathrow have shared with Arcadis during our review. Arcadis provide a summary of this information for the benefit of the CAA. Given the nature of this section, Arcadis believe it is relevant but not integral to the procurement strategy or our current scope of review. We therefore, do not provide commentary on the capability or appropriateness of the member organisations.

The Programme Client Partners (PCPs) were appointed in November 2016 to assist Heathrow in creating an effective, experienced and sufficiently well-rounded client organisation for the HEP.

The PCP members are:



Figure 11 - The programme client partners

PCPs will span DCO, Design and Delivery Planning and the Delivery phase of the HEP.

Currently, cost-reimbursable contracts have been executed for the PCPs until Heathrow have a single preferred Masterplan option (M4 gateway). Heathrow states the single preferred Masterplan will have a programme and cost associated with it, which it can hold the PCPs to account with.

The PCPs were procured under this contractual arrangement originally for 12 months (November 2016 to November 2017). The contractual arrangement was subsequently extended to the summer of 2017. Their contract was again extended to be fixed against the time of the M4 gateway.

Behaviours and cultural fit were a pivotal, selection criteria to PCPs as Heathrow sought the importance to establish long term relationships for what may be a 10+ year programme.

Having secured a positive NPS, Heathrow will now work with the PCPs to establish more detailed contractual arrangements based on the preferred masterplan and associated cost, schedule and programme.

Together with Heathrow these PCP organisations make up the Integrated Client Team (ICT). The ICT is not a legal entity or joint venture, but a common relationship based on a framework agreement for professional, programme, and project services. Heathrow wish to maintain one type of relationship with all 4 PCPs and ensure consistency across the ICT.

6.3 HEP Integrated Design Team (IDT)

This section contains information that Heathrow have shared with Arcadis during our review. Arcadis provide a summary of this information for the benefit of the CAA. Given the nature of this section, Arcadis believe it is relevant but not integral to the procurement strategy or our current scope of review. We, therefore, do not provide commentary on the capability or appropriateness of the member organisations.

The Integrated Design & DCO Team (IDT) were appointed in 2016 to assist Heathrow with programme Masterplanning, design & engineering services, and DCO consultation and submission. The scope of works covered by the IDT is shown in Figure 4 (section 3.2).

The IDT members are:

- **Amec Foster Wheeler** – [redacted]
- **Arup** – [redacted]
- **Atkins** – [redacted]
- **Grimshaw** – [redacted]
- **Jacobs** – [redacted]
- **Mott MacDonald** – [redacted]
- **Quod** – [redacted]

Heathrow has used these suppliers for all planning/design services associated with the HEP.

The current contractual approach has been to utilise existing framework agreements (see 10.1.7). Heathrow anticipate model modification to move to an alternative contractual approach at the end of Q2 to facilitate transition to Generation #2, as described below.

- Generation #1 - utilise existing framework contracts
- Generation #2 - targeted and refined scope, performance reviews and greater contractual alignment, building on existing foundations
- Generation #3 - collaborative contractual arrangements with shared liabilities and potential for target cost, mini /open competitions and/or further incentivisation dependent on certainty and definition of scope.

Heathrow reasons for using this framework for design include:

- Existing framework enables quick mobilisation
- Allows for suppliers to establish knowledge of Heathrow and the HEP
- Organisations contain existing global reach and aviation knowledge
- Long term relationship to foster appropriate behaviours
- Heathrow can build appreciation for organisations areas of strengths and weaknesses and build relationships with individuals.

A visual representation of the IDT governance shared by Heathrow in DG0 document is provided in Figure 14.

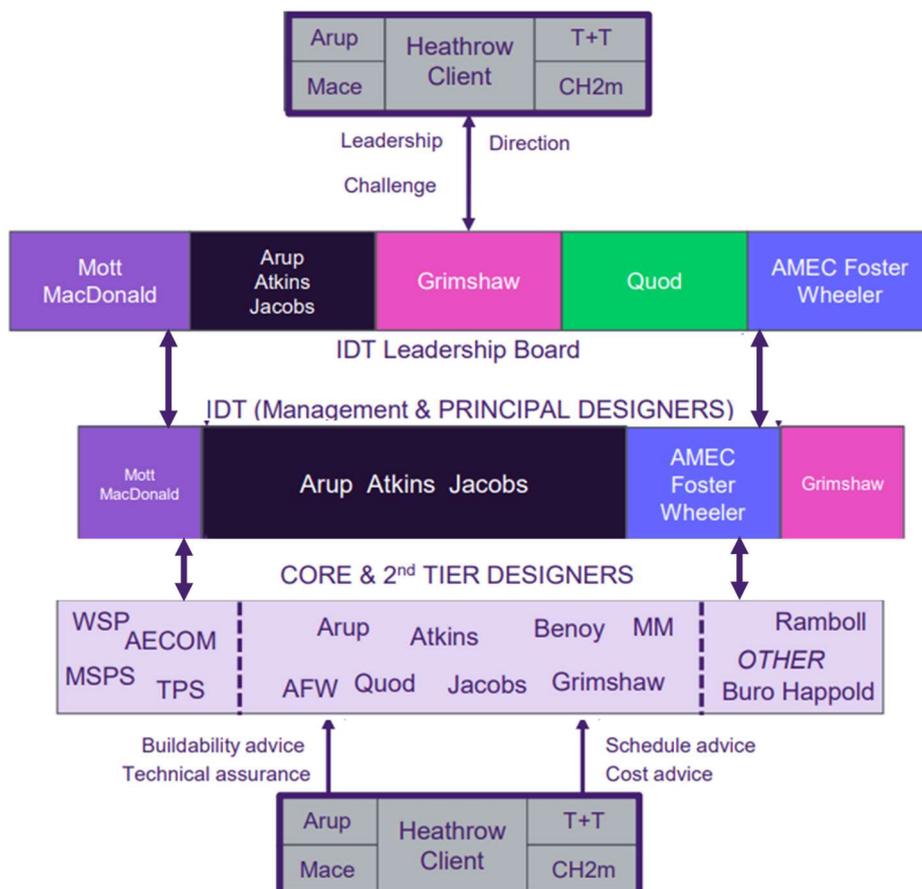


Figure 12 - IDT Governance structure

6.4 Procurement programme governance

Procurement governance for the HEP will be carried out in accordance with the Heathrow Procurement Review Committee (PRC) procedure. Heathrow do not intend to employ a bespoke governance process specially for the HEP. This governance process has not been reviewed in detail during our current scope of work, so no comment can be made about its appropriateness to the HEP. Arcadis believe it justified for a review of this governance process to be completed in the future further to procurement strategy development.

The decisions critical to procurement strategy are recorded in Decision Gateway (DG) governance process documents. These documents are created and released as Heathrow reaches each stage gate.

- DG0 Document is the Overarching Procurement Strategy
- DG1 Document (Sourcing Strategy, applicable to an individual package) sets out the information on:
 - Scope
 - Budget
 - Outcomes of sourcing event – ensuring value for money
 - Market overview and bidders
 - Commercial model - how will the supplier/s be remunerated and incentivised?
 - Contract type - who will buy from whom and what form of contract will be used?
 - What will the key contract terms look like?
 - Selection criteria and weighting
 - Process to select
 - Team that will carry out the evaluation
 - Programme(time) of sourcing to contract
- DG2 Document (award recommendation) makes a recommendation to award the contract to the preferred bidder(s).
- DG3 Document governs post award contract management ensuring a suitable contract is in place to deliver the works. Creation of a new Task Order

A key indicator in the effectiveness of a programme's operating model is the process by which necessary actions/works/packages are identified, rationalised and appointed to an accountable owner. In order to provide clarity on how Task Orders (TO) are created and assigned Heathrow have provided guidance on the process for the IDT which is included in Appendix 10.1.8.

Heathrow state TO owners are and will continue to be selected through 'Best Athlete' identification. 'Best Athlete' is based on skills, qualifications and experience of the proposed TO. While this approach is reasonable and commonly adopted, no evidence has been provided on how skills, qualification or experience are assessed, weighted or negotiated amongst potential TO owners from IDT members. A key source of information in assessing and ensuring 'best value' from such a process may be to analyse the relative spread of TOs and/or total value of TOs across the different IDT members. Arcadis have not been provided with this information but it may be insightful information for future reviews.

6.5 Risk management

Heathrow's documentation on procurement is not explicit in conveying any general risk management approach. Instead, Heathrow maintains its approach to, appetite for, and management of risk will heavily depend on the specific and individual package(s). This message was also shared by HEP leadership in our meetings. Whilst Heathrow maintain the preferred engagement model, procurement route and final allocation of risk will be based upon the individual package, in numerous instances (both written and verbal) Heathrow refer to this decision as always being 'value focused'. We believe terms used by Heathrow such as 'value focused' and other associated criteria could be more clearly articulated and shared.

From an operational perspective, it is noted that risks will be aggregated and conveyed to the HEP Joint Expansion Board via Heathrow's currently live risk dashboards. These are updated and presented monthly.

Heathrow is keen to articulate that as a “live client” they already operate a robust operational risk management process. This has been tried, tested and refined over both T5 & T2 developments as well as over the Q5 and Q6 periods. This is opposed to other large infrastructure delivery clients which often must build risk management functions anew from the inception of the programme.

In earlier drafts of documentation on the HEP shared by Heathrow it explains that there is an “expectation that it [Heathrow] will work collaboratively with the supply chain” to identify and manage risk, explaining they will take a proactive approach with:

- **A pre-emptive pursuit of potential risks**
 - Top down identification and evaluation of risk including whether the risk is at project, portfolio or programme level
 - Realistic responses pre-planned
 - Agreeing who actions, is responsible and accountable for actions on the basis of who is best able to influence
 - Making sure actions are given the right resources and management
 - Observing to regularly review and update potential risks and actions
 - Actively manage when risk has expired

- **An emphasis on being practical**
 - Focusing on risks that are important
 - Recognition and action are more important than exactness
 - Ensuring they communicate appropriately with others
 - Appreciating that the most unpredictable sources of risk are people

Heathrow is clear that their risk appetite will vary with individual packages. Subsequently their approach, packaging and management of contracts will also vary to suit. For example, packages relating to the airfields and the works included are felt to be well known by the organisation (Heathrow). As a client, they feel they can therefore be more involved and active. In contrast, large scale utilities work deviates considerably from Heathrow’s experience and knowledge, and therefore requires a different approach. These considerations shape their appetite, approach and management of risk. Heathrow appear to be building their procurement plans to accommodate this flexibility in risk management.

The principles and messaging behind risk management shared by Heathrow are reasonable, and confidence can be gained from their approach having previously been adopted on prior Capex projects and business as usual activities. HEP is therefore different to many other major infrastructure programmes, where the approach and management of risk typically determined and developed anew and in isolation. Heathrow have looked to avoid the problems which can result from this traditional approach.

Based on this initial view, for the reasons described above we feel risk management is an area in which Heathrow can demonstrate a wealth of experience and rigour in BAU. We have no reason to suspect these good practices would not be translated into operations for the expansion programme. This being said we have not had the opportunity to review this aspect in great detail. We feel identification, communication, aggregation and mitigation of risks is vital for HEP success. Given the importance of appropriate risk management, this is an area which warrants continued focus as the HEP progresses. All significant risks to the delivery of HEP’s commitments should be identified and mitigated on an active and ongoing basis.

6.6 Alternative delivery models

Stakeholders of the HEP, most notably the members of the airline community, have expressed an interest in the establishment of new organisation (“BuildCo”) which could be responsible for the delivery of the HEP. The stakeholders wish for Heathrow to consider this as an option for HEP going forward.

Arcadis view this as a consideration for strategic and business (Heathrow Executive Board) level. It would considerably alter Heathrow’s current and proposed organisation and leadership structure internally and in

relation to the HEP. As such, this consideration is separate from the procurement strategy. If clarity on this matter was required, a more detailed investigation could be completed on the proposal(s) to provide further opinion and information.

However, during our engagement Heathrow have not provided any information, either separately, or through their procurement strategy collateral that suggests they are considering a separate delivery entity for the entire HEP. Heathrow's commercial team expressed an intention that contracts with the supply chain will be held by Heathrow Airport Limited (HAL).

Furthermore, we are of the opinion that the creation of a separate legal entity to facilitate the sole delivery of the HEP would take a significant amount of time to plan and create. A relevant case study would be that of the delivery model for the 2012 Olympics, where the client, the Olympic Delivery Authority (ODA) provided overall direction for the programme, but which then delegated the detailed management of delivery to an integrator organisation, CLM. The CLM was a separate legal entity which took over 1.5 years to create and mobilise. While Heathrow have stated that no delivery option has been completely ruled out at this stage, we feel the time necessary to do so does not align with their current overall programme for the HEP.

Furthermore, the creation of an entirely new organisation would present significant risk to the programme's ability to deliver, beyond concerns of time. A new organisation would start with no delivery history, no tested operating model and no resource capability robustness, and ultimately would be likely to bring additional cost to the programme.

The Expansion Programme Director has also added that for this approach to be properly investigated by Heathrow the airline community should provide more detail on the benefit case of doing so and their proposals for its feasibility and operation.

While the PCP and Heathrow have created an 'Integrated Client Team' as detailed in section 6.2 of this report, the ICT is an unincorporated alliance. Heathrow has adopted this approach to ensure consistency in contracts for each PCP member. It is not the intention for the PCPs or the ICT to be a legal operating entity.

One interpretation of an alternative delivery model may be what we have coined a 'full extent Design & Build' delivery model for a large scheme component, as discussed in section 4.6.1. This would include contracting out a large component (say, an entire terminal, or the entire surface access infrastructure for example) from concept design and right through to delivery, all as a single contract. To reiterate, the information provided about the HEP structure and other related comments (e.g. seeking to be a 'hands-on' client) imply that they are not actively pursuing a 'full extent' D&B. While Heathrow have given us no reason to believe they are perusing this 'full extent' D&B deliver model actively, their Innovation Partner process may include contracting out elements of their design at a sub-component level.

One final interpretation of an alternative delivery model we understand the CAA may wish clarification on is any operating model which goes beyond delivery. For example, models which include delivery and operation of assets. Arcadis have not specifically sought to understand whether Heathrow are entertaining proposals for such models in this review. However, as described in section 4.4.1, information given on their website, which clearly states "*Heathrow will continue to own and operate the hub airport as a single entity*" indicates they are not.

6.7 Heathrow related 3rd parties

In the CAA's CAP 1541 document (section 4.31) the CAA refer to the efforts of Heathrow to ensure buy-in from the airline community for their procurement plans. It advises "*Heathrow should use best endeavours to secure similar agreement for capacity expansion, providing the information and evidence to deal with the concerns that airlines have recently expressed about its procurement processes.*"

The concerns of the airline community are both general and specific. Specific concerns include what measures or safeguards Heathrow might propose to ensure against conflicts of interests which arise regarding Heathrow associated 3rd parties. Heathrow have directly responded to these queries as detailed in Figure 15 below.

“Heathrow complies with its Licence. We published our Procurement Code of Practice (Oct 2014) and our Annual Statements as required by Condition 3 of our Licence. In addition, as discussed in our submissions to the CAA, we consulted and agreed our Procurement Strategy with the airline community for the Q6 period. The IFS reviews the efficiency or otherwise of our capital investment delivery including procurement. Airlines’ claims are not supported by evidence nor consistent with their position at the beginning of Q6.

Heathrow’s intention has always been to openly engage with the airline community throughout the Constructive Engagement (CE) process, in order to find an approach to procurement that furthers the interest of consumers. We have recently created a workstream with the airline community focussed on procurement. This workstream directly reports into the Joint Expansion Board (JEB). The remit of the procurement workstream includes working together openly on the development of the HEP Delivery Procurement Strategy. This workstream should address airlines (unsupported) concerns by facilitating sensible and open discussions.”

Figure 13 - Heathrow's response via query log

Furthermore, in discussions with Heathrow, The Expansion Programme Director articulated that airlines do not generally raise these concerns in the airline engagement forums. Nonetheless, Heathrow rely on corporate procedures which have been reviewed and tested during the Q5 period and Q6 periods and are constantly monitored and subject to future reviews. These measures, Heathrow leadership have stated, are in place to *“ensure fairness and to ensure appropriate governance where necessary. This includes, at a Heathrow board level, members of Ferrovial being asked to leave the room when a potential conflict of interest is evident”*.

Furthermore, Heathrow’s Expansion Commercial Director, speaking from a market competition perspective, added *“That kind of bias does not help us at all, it absolutely kills market interest in the supply chain. Therefore, we are very keen to avoid that type of bias.”*

Heathrow have also made clear that as critical stakeholders in the HEP they ensure close liaisons with the Airline Operators Committee (AOC) the International Airlines Group (IAG) as well as Virgin Airways representatives. They seek to engage regularly both through formal forums, such as the HEP Airline Procurement engagement group, as well as informally through strong working relationships and open communication to ensure concerns are understood and addressed appropriately.

6.8 Logistics hubs

The expansion programme is aiming to drive efficiency through widespread use of Logistics Hubs (also referred to as ‘Supply Hubs’). It is proposed there will be 4 Logistics Hubs located in the UK, one of which will be in Scotland.

HEP will utilise the Logistics Hubs to orchestrate the pre-assembling of components off-site before transporting them in consolidated loads to the Heathrow site.

Heathrow have stated that the aims of the HEP logistics hubs are:

1. Deliver efficient and affordable expansion (affordable)
2. Deliver strategic and economic benefits for Britain (diverse British supply chain)
3. Enable quicker delivery to unlock the benefits of an expanded airport sooner (productivity – Quality & H&S)
4. Create a platform for excellence in sustainability (sustainability)
5. Support our existing operation (maximise off-site opportunity)

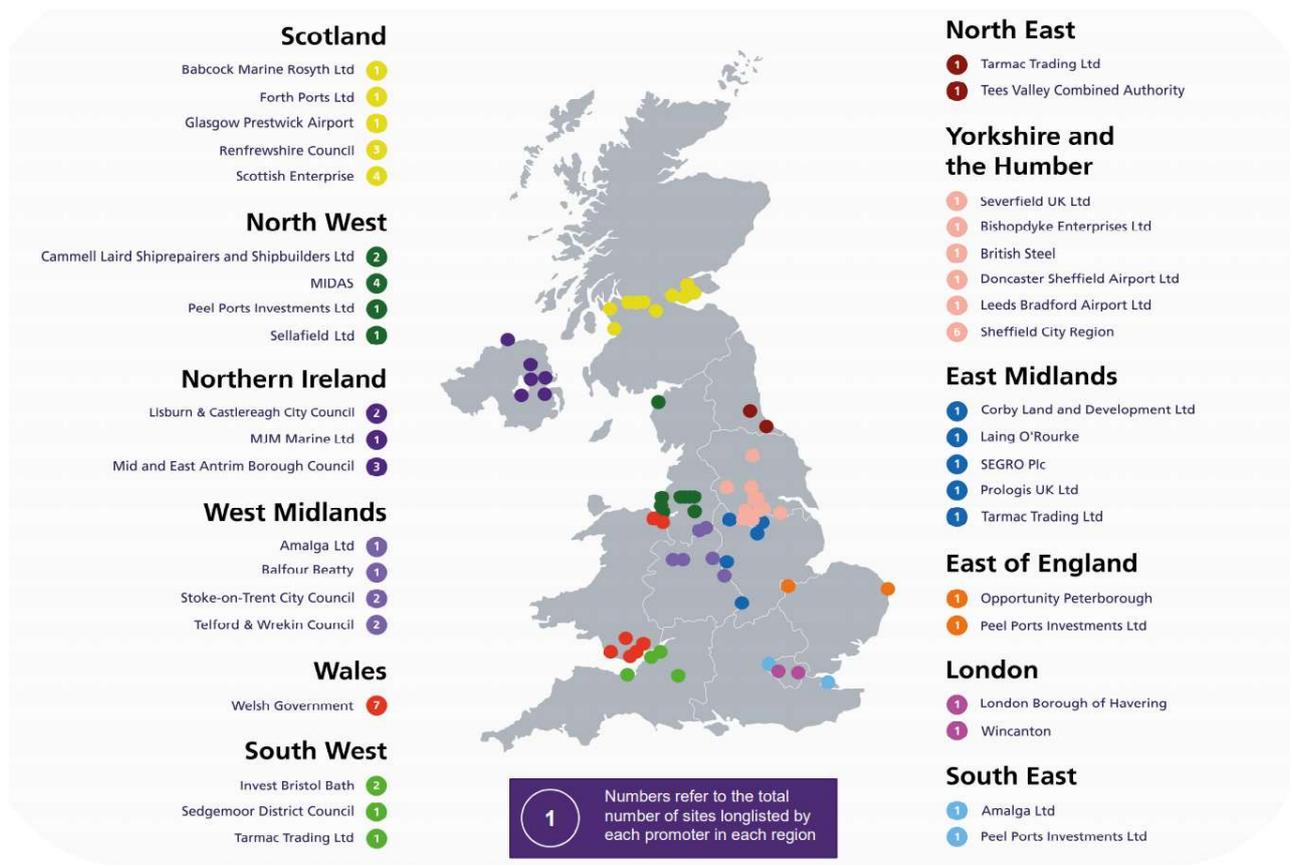


Figure 14 - Current long list of locations for Logistics Hubs

There is a further down selection process planned to begin in 2018 as detailed:

- Logistics hub PQQ planned for Late 2018
- Logistics hub ITT planned for Early 2019

The proposed use of Logistics Hubs has likely been chosen to help Heathrow specifically achieve the aims of the HEP, namely: *“to win and maintain the support of politicians, businesses, shareholders, local communities and the wider UK public for the expansion of Heathrow”*, and to *“build a skilled, nationwide supply chain that ensures that all of the UK benefits from Heathrow expansion and delivers it safely, on time, on budget and to the right quality”*.

The Logistics Hubs will be critical to efficiency and value for money on the HEP. The selection and use of Logistics Hubs are not explicitly procurement decisions and therefore has not been reviewed in detail as part of this report.

7 Commercial and Contracting Model

Heathrow is currently updating the Commercial & Contracting Strategy, which forms part of the Overarching Procurement Strategy (DG0). This update is due in Q4 of 2018. Outside of the information shared, Heathrow is keen to articulate their ambition to deliver expansion through an approach which is more than a ‘traditional’ contractual relationship. They wish to develop ‘partnerships’ with their supply chain which are aimed at being more equitable for all parties concerned.

7.1 Remuneration and incentivisation

In previous versions of the DG0 document, Heathrow has articulated a default cost build-up and pain/gain incentivisation model. The latest DG0 does not make any reference to incentivisation but given the iterative nature of DG0 document change is accepted. Heathrow has not made clear decisions relating to remuneration and incentivisation, which can only be confirmed once the details of the package are understood. Arcadis appreciate this position but emphasised the importance of these decisions and impact on strategy.

Reimbursable contracts have been executed for the PCPs until the HEP has a simple preferred Masterplan (anticipated late 2018). Heathrow states the Masterplan will have a programme and a cost that Heathrow can hold the PCP to account with.

The key principles of this incentive model would need to consider the following points:

- Easy to understand and administer with well-defined principles;
- Programme and package incentives focused on cost benefits that does not impact operational costs and key milestone dates;
- Implement incentives that drives integrated working between all parties (client, design and delivery) through the alignment of programme objectives;
- Flexibility to reward suppliers for achieving key dates with bonus payments when achieved, but also accepting impact when missed across project and programmes;
- All parties incentivised to proactively manage risk by offering a share of any unexpended programme risk allowance but also sharing programme integration risk when not achieved.

7.2 Contracting terms

Historically Heathrow have used the NEC3 form of contract to deliver programmes such as T5 and T2A. This form of contract has been utilised in other large infrastructure programmes of work across the UK such as Crossrail, Thames Tideway Tunnel and the 2012 London Olympics. The NEC is endorsed for public sector use in the UK Government Construction Strategy as well as by the Construction Clients' Board, the Crown Commercial Service, the Facilities Management Board of the UK Cabinet Office, the Association for Project Management and the British Institute of Facilities Management.

Heathrow maintains it will adopt a flexible approach to contracting which reflects the specific requirements of each package and is suitable for the allocation of risk and incentive mechanisms required.

Heathrow strategy documents explain there is a requirement for a form of contract that offers Heathrow an option for early contractor involvement. Similarly, there is the requirement for an auditable, open book function from a commercial perspective.

Heathrow has said they will *“require that all parties agree to provide open book access and full transparency of all costs, at all levels within the supply chain unless a fixed price approach has been agreed and subject to demonstrating best value but does not undermine the key principle of collaboration. Heathrow will have direct access and unfettered right of audit of contractor cost accounting systems for the purpose of cost verification.”* In subsequent meetings however, HEP leadership have suggested they are assuming to avoid simplistic fixed price lump sum contracts. They see these contracts as more transactional and not conducive to the appropriate supplier behaviours or for fostering the spirit of the ‘partnerships’ approach Heathrow is keen to instil in the supply chain. Heathrow is also looking to continue with their model of having a balanced approach to risk and offering the suppliers incentivisation mechanisms where efficiency and innovation is encouraged.

In 2017 NEC introduced NEC4 which was developed following industry feedback to ultimately make the suite of contracts even more user-friendly, flexible and collaborative. The change was dubbed ‘evolution not revolution’.

In meetings with Arcadis, Heathrow has expressed a desire to move towards the use of the NEC4 suite of contracts primarily, but not exclusively for the HEP. On the assumption Heathrow will endeavour to adopt the NEC4 suite of contracts, this constitutes a change from its previous contracting approach to that of its most

recent large programmes. For the benefit of the CAA, Arcadis have provided a comparison of the two most recent NEC suites and what those changes might mean for the HEP contracting strategy.

The additional NEC contract provisions and comparison with previous suite is summarised in Appendix 10.1.9. The additional NEC provisions align with Heathrow's commitment to be a fair, consistent and lawful employer and with their corporate values and behaviours.

Regarding their impact on HEP, new and amended secondary options can be summarised as follows:

- **Building Information Modelling (BIM)** would be beneficial to Heathrow as they implement BIM and would therefore make the process easier.
- **Early engagement of a contractor** would also be beneficial as it would enable Heathrow to more easily address their desire to utilise Contractor's knowledge at an earlier stage.
- **Design responsibility & Contractor's Design Option** offers flexibility in terms of design responsibility and can be reviewed on a contract by contract basis to ensure it suits Heathrow's design risk strategy.
- **Contractor's Proposals** is in alignment with Heathrow's commitment to incentivisation as well as fostering a more collaborative (versus transactional) relationship with its supply chain.

In summary the NEC4 is a further improvement NEC3 which, if applied and managed appropriately, will offer Heathrow flexibility around early contractor involvement, risk allocation, incentivisation etc. It is an appropriate option for HEP, taking into consideration the scale and complexity of the programme and infrastructure market recognition and support. Irrespective of the chosen suite, we maintain that early identification and clear definition of user requirements and works information is fundamental to a successful contracting approach. This will be particularly relevant given the number and complexity of the HEP's interfaces with existing infrastructure. Ensuring user requirements are defined sufficiently early to facilitate the commencement of procurement will be of critical importance to the HEP.

Whilst using NEC contracts appear to be Heathrow's default position, the HEP leadership have made clear they will seek to tailor their contracts to be bespoke and suit the specifications of the package. As noted, the effectiveness of this will rely heavily on the ability to define user requirements and technical specifications clearly and sufficiently early.

8 Learning and Innovation

In the development of its procurement strategy, Heathrow has attempted to draw lessons learnt from the delivery of both the Terminal 5 & Terminal 2 programmes and from the Q6 programme to date. For more information please see Appendix 10.1.10.

In addition to lessons learnt from T5, T2 and Q6, Heathrow have also sought to learn lessons from other major programmes such as Crossrail, HS2, ODA, HPC and Thames Tideway. They have also sought to exchange knowledge with EDF, Hinckley nuclear facility and TfL. Heathrow have done this via direct engagement and through knowledge transfer with their Programme Client Partners. They have had engagement with ICE, RICS, Construction Excellence to further understand current infrastructure delivery Best Practice.

Heathrow give examples of how lesson learned exercises have influenced HEP procurement strategy development including:

- The option of having direct relationships with key suppliers (Technical Contractors)
- The creation of a dedicated logistics function
- New variants on commercial models

While the above are positive ambitions of Heathrow, given the fact they are yet to implement these ambitions, it is too early to say whether these adopted lessons learnt will materialise to produce efficiencies or improved delivery.

With regards to innovation, Heathrow state: *"Heathrow is focussed on realising the potential for innovation in all areas – process and product in both creation and operation. Core to this, Heathrow has established an*

Innovation Hub, with dedicated resourcing and under the sponsorship of ██████████ Heathrow Expansion Executive Director. The Hub has been instrumental in developing the focus and establishing agreed priorities, with allocated responsibilities, for the pursuit of innovation in those areas.”

It is difficult for Arcadis to comment on the impact of the Innovation Hub until the HEP is either more mature in its planning or until the delivery phase has begun and the effects of innovations are being realised. This may form part of a future review of the expansion programme.

The HEP has been chosen to be one of four ‘early adopter’ programmes for the ICE’s Project 13 initiative. Along with Anglian Water’s Capital Delivery Alliances, the Environment Agency’s Next Generation Supplier Arrangements and National Grid’s London Power Tunnels, Heathrow will create a ‘Project 13 implementation group’ to share experiences and learnings from the programmes.

Project 13 is intended to boost productivity levels across industry and bring about a series of improvements to the quality and reliability of the UK’s infrastructure networks. It aims to do this by *“creating new business models based on relationships, as opposed to ‘traditional’ transactional arrangements”*. ICE claim *“that will boost certainty and productivity in delivery, improve whole life outcomes and support a more sustainable, innovative, highly skilled industry”*. The initiative is embraced by government organisations including the Infrastructure Projects Authority (IPA) and the National Infrastructure Committee (NIC).

Project 13 places a focus on achieving three outcomes:

1. The improved management of risk,
2. Capturing best practice and thereby getting the basics right
3. Stretching the boundaries through innovation

Heathrow is clearly committed to the initiative, demonstrated by Heathrow’s Expansion Programme Director’s leadership of one of the initiative’s 5 workstreams (Capable Owner). To this end, Heathrow will look to establish long-term and mature relationships with supply chain partners. This indicates that Heathrow will avoid extensive use of fixed price, lump sum contracts which are described negatively as ‘transactional’. Arcadis would like to compliment the commitment shown by the Heathrow, and The Expansion Programme Director personally, and would now be interested to understand how the principles advocated through the Project 13 will translate into elements of the HEP’s strategies and decision making throughout the programme.

In addition to engagement with other clients and programmes, Heathrow is also actively involved with other industry bodies and initiatives including; Build UK, Constructing Excellence, ICE, CECA, TIF, RICS, APM, Build Off Site, I3P. Heathrow has the reputation as a leading client within the UK construction industry.

Currently there is not one single aviation body that represents the aviation supply chain. Due to the scale of the Heathrow Expansion Programme, Heathrow has mentioned there may be the opportunity to set one up as a single point of contact.

To understand the performance of the programme, we feel the creation of robust and comprehensive Key Performance Indicators (KPIs) and a KPI framework is developed for the programme. Heathrow has said they intend to do this, and that appropriate KPIs will be identified in 2019.

9 Stakeholder and Market Engagement

9.1 Stakeholder engagement for HEP procurement strategy development

Heathrow has created several forums to ensure stakeholder engagement and continued procurement development as shown in Figure 17. An initial quarterly forum was created in 2015 and additional, more frequent, forums were established in 2018.

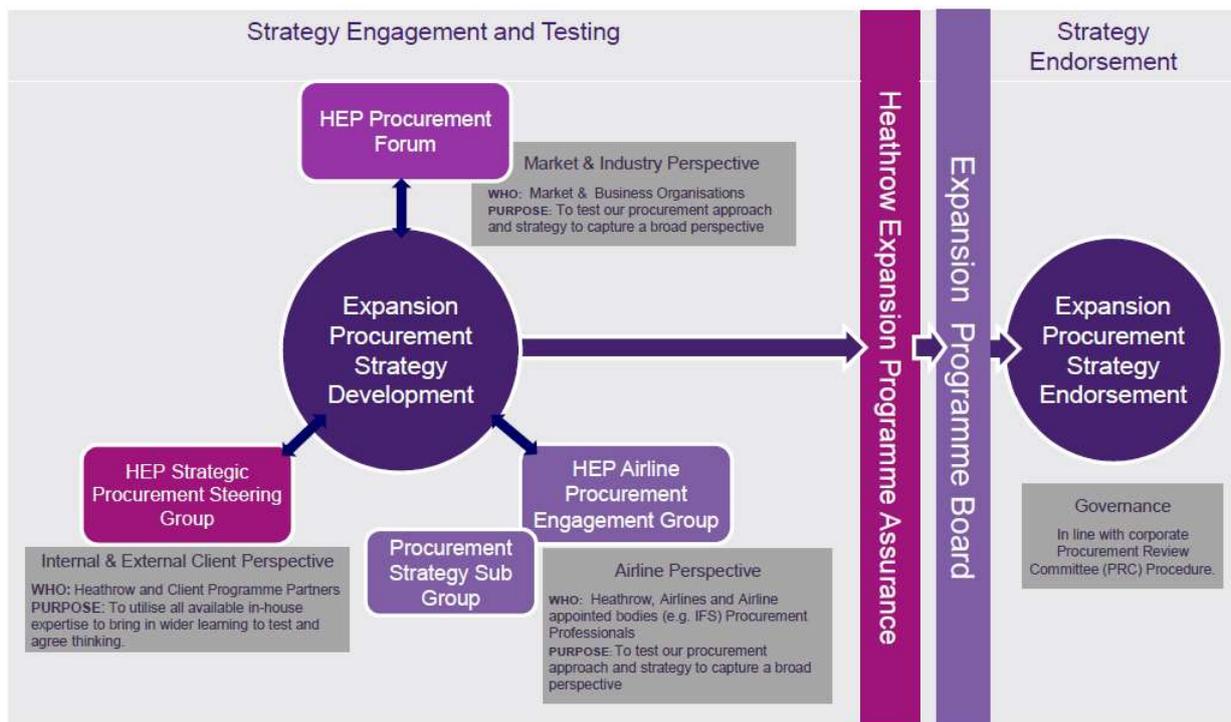


Figure 15- HEP Procurement Strategy Development & Governance landscape

The forums have sought wide stakeholder engagement and are intended to be two-way conversations as Heathrow is keen to develop their engagement process and further progress their procurement strategy with stakeholder input. Details provided in Table 2 below.

Forum [Created on – Frequency]	Purpose	Attendees
Heathrow Expansion Programme Procurement Forum [Oct 15 – Every 4 months]	MARKET & INDUSTRY PERSPECTIVE: To test Heathrow’s procurement approach and strategy to capture a broad perspective	[Redacted]
Heathrow Expansion Programme Strategic Procurement Steering Group [Feb 18 – Monthly]	INTERNAL & EXTERNAL CLIENT PERSPECTIVE: To utilise all available Heathrow inhouse expertise to bring in wider learning to test and validate thinking.	[Redacted]
Heathrow Expansion Programme Airline Procurement Engagement Group [Mar 18 – Monthly]	AIRLINE PERSPECTIVE: To test Heathrow’s procurement approach and strategy to capture a broad perspective	[Redacted]

Table 2 - Summary of Procurement Engagement Forums

Heathrow has explained that given the prospective length of the HEP it is important both internally and externally that future leaders and relevant succession planning is considered. Heathrow intend to plan accordingly and encourage their supply chain to do so as well. Heathrow wish to promote long term planning and diverse stakeholder input. They see this as a means for improving their procurement strategy, delivery and resilience.

9.2 Supplier engagement



Figure 16 - HEP Supply chain communication & engagements

As Figure 18 shows, Heathrow have held market engagement events since 2015, including business summits aimed at attracting SMEs. Heathrow detailed that they have held five business summits in 2015, four in 2016 (plus seven procurement roundtables), seven in 2017 and five to date in 2018 (with a further 5 planned for H2,18). Heathrow state that the feedback they have received from market engagement has been "very positive".

Heathrow's last major market engagement event was on 8th February 2018, attended by c.132 people. Following this, Heathrow organised further workshops on more specific themes which were also well attended:

- Optimising Offsite Solutions: 4th May 2018 – c.46 attendees
- Making Logistic Hubs Work: 4th May 2018 – c.29 attendees
- Low Carbon Construction Solutions: 11th May – c.56 attendees
- Improving HS&W Performance: 21st May 2018 – c.30 attendees
- Drivers for Improved Efficiency: 20th June 2018 – c.36 attendees

In addition to these workshops Heathrow organised the 'Innovation Partners' supplier briefing event, which again was well attended with c.106 attendees.

Whilst general supplier engagement has begun, no specific Early Contractor Involvement (ECI) has been completed or planned to date. This is due to the development of preferred Masterplan.

Market and supplier engagement are set to increase with time. However, given the scale of the HEP and stage of development Arcadis would have expected greater supplier engagement to be completed to date. We would encourage an assessment of appropriate capacity, skills and capability of the potential market and supply chain going forward is factored into events. We would encourage Heathrow to continue to make

sustained efforts to create interest within the supply chain and promote itself as a client of choice at events. While the engagement described above is positive, this will continue to mitigate the risk of resource clash with other major infrastructure programmes.

In addition to the above, the HEP leadership stated they are keen to maintain “*good informal relationships*” with key construction industry suppliers. Particularly large, “main contractor” organisations. This is not only to promote potential good working but also to understand market pressures on various organisations.

9.3 Market capacity and influence

The assessment by Heathrow on market trends is influenced by size (market spend) and spend (Capex and new/large programmes) respectively. Whilst relevant we would highlight that this does not factor other equal or less singular projects but cumulatively influential programmes. For example, TfL and Highways England budgets include large Capex or Opex spend that may absorb market attention and resources (4LM, Deep Tube, CIP, DIP etc). Some of these are considered by Heathrow, but other organisations might need to be factored into their evaluation as well as the impact of smaller projects absorbing skills in market. Utilities could be an example, e.g. Thames Water’s spend over next AMP period and contractor use.

In their procurement strategy Heathrow reference a piece of work by Towner & Townsend to assess the volume and capacity of the UK infrastructure construction market up to 2024. See Appendix 10.1.6. This shows a considerable increase in infrastructure market volume in that time period. Coupled with skill shortages and the potentially worsening impacts of Brexit, this poses a significant risk to the deliverability of the programme. Arcadis have written extensively about the impact Brexit may have on the UK construction industry (Arcadis Talent Scale 2018).

Heathrow is confident they will be able to attract the necessary pedigree and skills in the market. As a client they feel confident in attracting the skilled contractors and internal workforce required to deliver HEP and in turn are looking at the market for construction excellence. As described in section 6.1.1 Heathrow considers itself and the HEP to be an attractive organisation and programme respectively. One such view is that Heathrow benefits from the longevity of the programme itself, as well as the ongoing and planned BAU projects they offer before, during and beyond the HEP.

They favour Project 13 and the ‘Farmer Report (2016)’ to influence their thinking and approach and engagement in the market going forward. They have also noted and learnt from the lack of diversity in recent engagements and events (e.g. only 7 women out of 50+ attendees) and appear to be considering ways of widening engagement and profile of contractors and representatives. Again, an awareness and willingness to accept Best Practice and developments in the sector and current themes of development.

There is also an aspiration for Heathrow to open its own training facility or college, providing access to accommodation to support the workforce and working with UK Government and other major infrastructure clients to address skills gaps. This activity is being spearheaded by Rt Hon, the Lord Blunkett as Chair of the Heathrow’s Skills Taskforce. The taskforce was anticipated to begin once a positive NPS had been confirmed. Lord Blunkett is due to release a paper outlining his approach in the coming months. Arcadis believe this activity to be beneficial to the programme, as well as the UK market more generally and thus should be encouraged. There is also potential scope for Heathrow to consider promoting itself to a more international supply chain which may help alleviate UK skills shortages.

Heathrow appears confident that their procurement plans and the delivery programme will not conflict with other significant market activities. Heathrow has engaged with other programmes including HS2, Hinkley, and appear to have factored significant programme events into their timeline e.g. Hinkley earthworks will complete when Heathrow commence theirs and this will not overlap (to a detrimental degree) with HS2 earthworks.

In order to mitigate the impacts of supply constraints on labour, material and plant caused by a buoyant UK infrastructure market, and the cost of these supply constraints on delivering the scheme, Heathrow will need to ensure that appropriate planning is made in order to mitigate against these pressures.

Heathrow has suggested such plans could include:

- Training and development of skilled resources
- Consideration of purchase rather than hire key items of plant

- Integrated planning with our supply chain and other infrastructure clients
- Constructability reviews to identify alternative methodologies
- Purchase of the resources in an alternative manner e.g. Buy Clubs

9.3.1 Understanding external influences

Heathrow has also referenced several other external factors which will influence the procurement and the delivery of the HEP such as:

- Political dynamics (e.g. the National Policy Statement, or a potential change of government)
- Economic dynamics (e.g. impacts of Brexit or inflation)
- Social dynamics (e.g. demographic changes and lifestyle changes)
- Technology dynamics (e.g. new innovations not factored into strategy)
- Legal factors (e.g. tax policies and competition regulations)
- Environmental factors (e.g. environmental legislation)

Some of this thinking has been captured through a PEST and SWOT and analysis found in Appendix 11.1.11.

The PEST analysis' output has led Heathrow to consider incorporating the following into their strategy development:

- Need for a national & regional supply chain. Emphasis on their logistics hubs strategy.
- Avoidance of other infrastructure programmes to avoid 'overheating' market.
- Skills shortages & aging demographics puts more pressure on pursuit of productivity.
- Use of common Heathrow/supply chain common data environment.

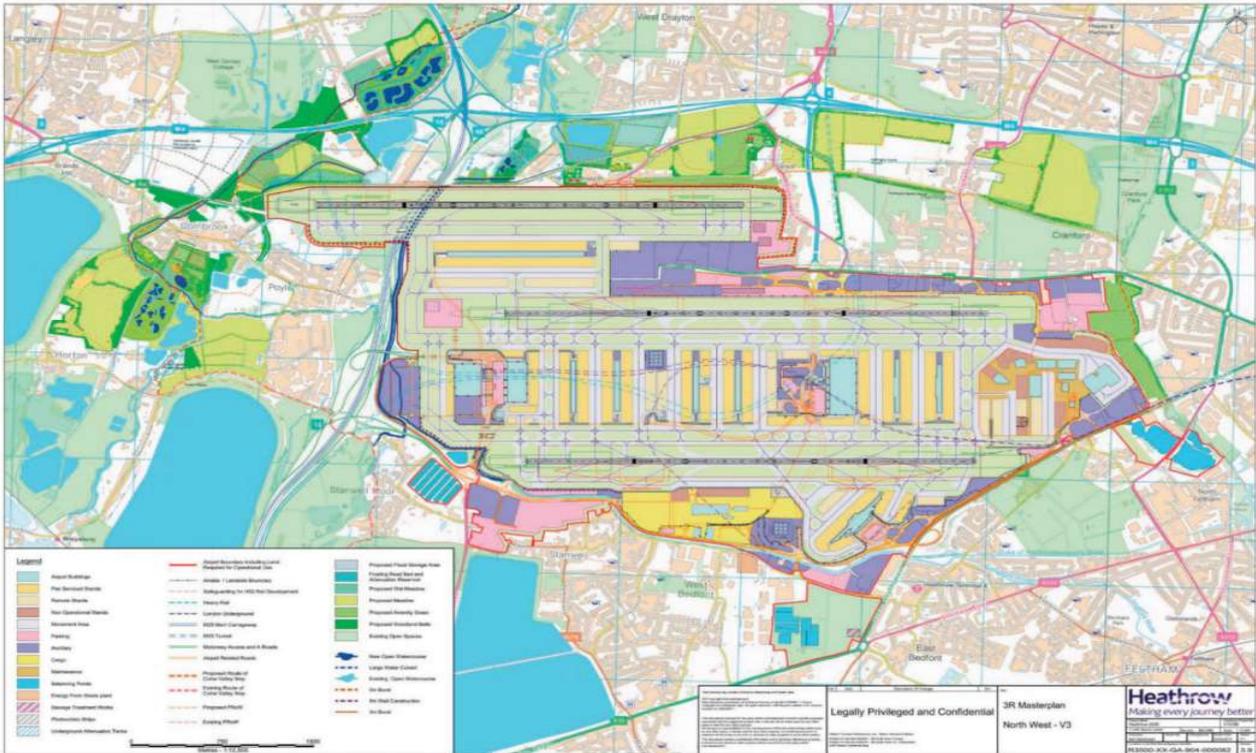
The SWOT analysis' output has led Heathrow to consider incorporating the following into their strategy development:

- Taking advantage of T2 and T5 experience and their 'informed client' status, to 'hands-on' with their supply chain and build long term relationships with key suppliers.
- The appointment of PCPs to fill gaps in Heathrow experience/capability (e.g. rivers, roads)
- Take advantage of improved infrastructure links to Heathrow as a means of attracting talent to the programme.
- Historic low margins in contracting, leading to low R&D investment – Heathrow to provide long term confidence of finance to supply chain and encourage investment & innovation.

10 Appendices

10.1 Additional information from Heathrow

10.1.1 Masterplan of Heathrow Expansion as submitted to the Airports commission (2015)



10.1.2 Full list of HEP commitments relevant to procurement

95% of Heathrow's expansion procurement spend will be with the British supply chain, including 60% outside London
A pledge to follow the new public sector procurement rules regarding steel purchasing, supporting up to 700 skilled jobs in the British steel industry
A commitment to open a number of 4 new supply chain hubs in the UK to help build the new runway, including a site in Scotland
Creation of a Procurement Forum of industry leaders to secure supply chain opportunities across the UK during construction and beyond
Growing and funding Heathrow's successful Business Summits which give SMEs front-line access to Heathrow's biggest suppliers. Regional Business Summits so companies and entrepreneurs in every nation and region have the chance to bid for work on the construction and operation of an expanded Heathrow.
Ensure suppliers are paid in accordance with the Prompt Payment Code and that this flows down through the supply chain into SMEs
Establish an Innovation Networking Forum for SMEs
Offer SMEs access to the millions of international passengers at Heathrow by brokering deals between stockists and WDF and other retail tenants
SME Grants Programme – establish a grants programme offering awards up to £2k for SMEs to spend on travel and trade missions to help SMEs reach new markets
Creation of an employment and Skills Taskforce – chaired by Lord David Blunkett – to plan and deliver a skills pipeline for expansion
Provide significantly better learning facilities to communities than currently available. This includes the setting up of a skills task force to create 10,000 new apprenticeships and 40,000 new jobs
Commitments for Scotland, including up to 6,000 new jobs, investigation into Glasgow Prestwick Airport as a logistics hub, £200m in construction spend in Scotland,, marketing of Scotland at Heathrow and procurement event in Glasgow.
Compliance with 'Procurement Approach'
HAL's responsibility for development and capital costs. HAL's scheme, including all development, planning and capital cost shall be financed by HAL without any Government financial support save in relation to potential shared contributions that are expressly acknowledged by HAL and the SOS
HAL should also support the LLW – the national living wage (£8.75) outside London boroughs would apply if Heathrow were to lease or own other premises.

Creation of 179, 600 regional jobs, of which 71,600 are in London and south east, 78,600 rest of England and 29,500 rest of UK

Protect more than 100,000 local jobs and create tens of thousands of new jobs nationwide by developing our local employment, apprenticeships and skills programmes and supporting a supply chain throughout the UK.

Economic benefits to passengers and the wider economy worth up to £61bn over 60 years

10.1.4 HEP draft package structure



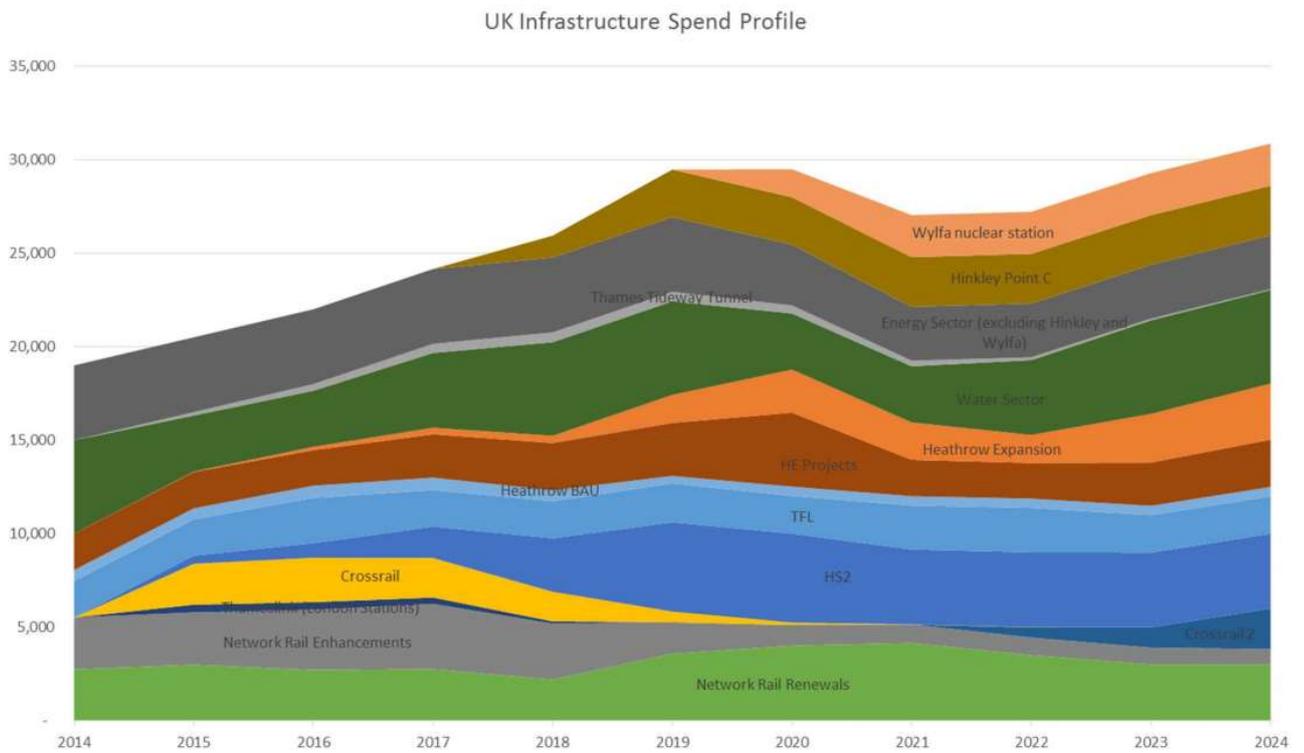
To aid in consistency of language, Heathrow's preferred programme nomenclature is as follows

- HEP programme
- Sub-Programme areas (e.g. **Infrastructure**)
- Projects (e.g. Infra -> **Enabling works**)
- Sub-projects (e.g. Infra-> Enabling -> **Earthworks**)
- Package (e.g. Infra-> Enabling -> Earthworks -> **Archaeology**)

10.1.5 Summary of HEP preferred engagement models per package



10.1.6 Further Information UK Infrastructure Spend profile



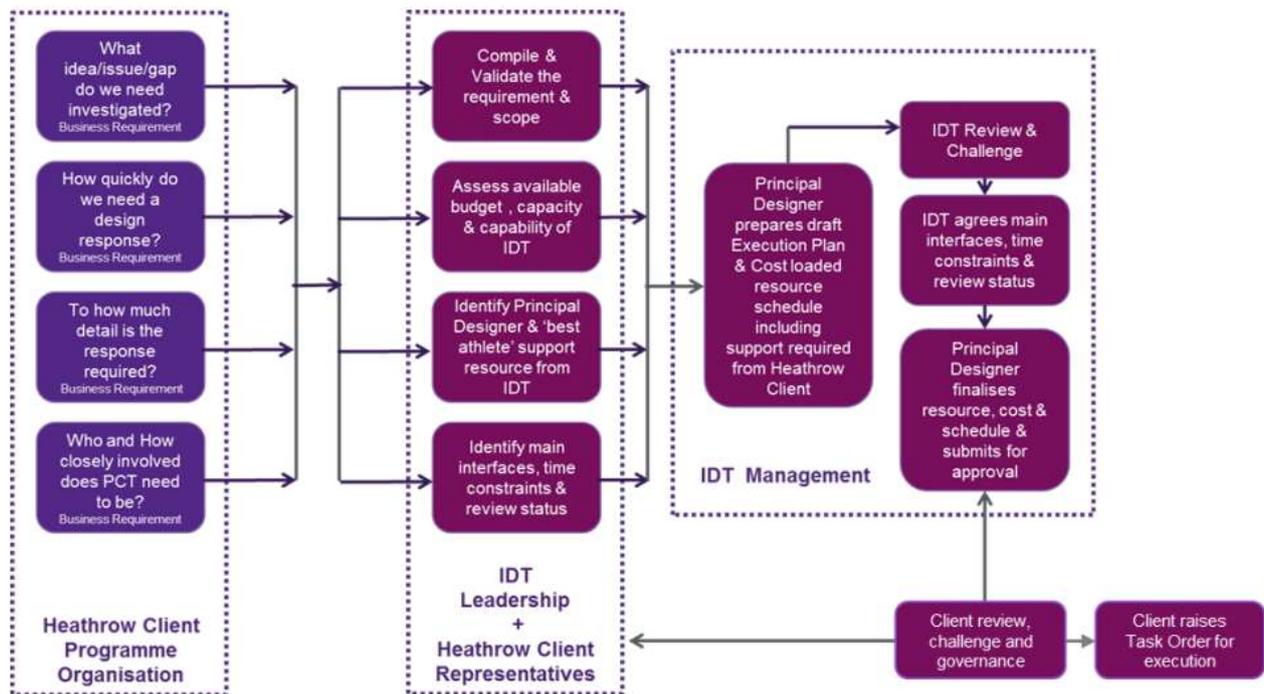
10.1.7 List of active Heathrow framework agreements



10.1.8 Process for Task Order creation

The following process description and subsequent process map has been provided to Arcadis by Heathrow's commercial team.

“The activity is initiated by the Programme Client Organisation confirming the need for a Task Order which will include definition of the issue and the level of detail required to be output. Following this identification of need, the IDT Leadership Team, which includes Heathrow Client Representatives, work together to further define the requirements and detail of the Task Order. Once appropriately defined, the IDT Leadership team assess the recommendations made by each of the IDT organisations and identify, through the process of ‘Best Athlete’ identification, who is the best organisation to act as Principal Designer and which individual representative from this organisation will become the Task Order Lead. This process is completed through consideration of the skills, qualifications and experience of the proposed Task Order leads as well as the overall corporate experience of the Organisations. Once identified, the Task Order Lead generates a draft execution plan and cost loaded resource schedule, for submission and consideration by the IDT Leadership team. The key focus of a review at this stage is to ensure that it is set up to achieve the desired outputs at the appropriate time, that it is well coordinated and planned in order to represent. Once finalised, the package of material will be submitted as a proposal to the Programme Client Organisation. Once reviewed, any questions, concerns or queries will be resolved in discussions between the Programme Client Organisation and the Task Order Lead, once resolved, governance is completed, and contract documents are issued for execution.”



10.1.9 Details of updates to NEC contract suite provided by Arcadis

In terms of the Core Clauses the main additional provisions from NEC3 to NEC4 can be summarised as:

1. New clauses relating to bribery and corruption including a right to terminate.
2. New clauses covering confidentiality and publicity, such as a restriction on the disclosure of project information.
3. New clauses covering the transfer of benefits (i.e. the assignment of rights) under the contract.
4. New clauses requiring the contractor to prepare a quality management plan/system.
5. New clauses permitting Contractors in cost-based contracts (Options C, D, E and F) to request a review and acceptance of its Defined Cost during the project and not wait until the end.

In terms of key amendments made to Core Clauses, they can be summarised as:

1. Programme:

Core clause wording now provides for deemed acceptance of the contractor's programme if the project manager (PM) fails to respond within the prescribed timescales.

2. Payment:

Updated provisions requiring the contractor to make an application for interim/final assessment. No payment is made if the contractor fails to make this application. (This provision previously applied in the short form NEC contracts but is now applied to all contracts.)

3. Changes to compensation events (CEs) within the core clauses:

The option to include bespoke additional CEs within the Contract Data (rather than Z clauses).

A new CE to compensate the contractor for the costs of preparing quotations that are not accepted/instructed.

There are also several new and amended Secondary Options:

1. Building Information Modelling (BIM)

Provision of a clause to support the management of Information Model Requirements and to deal with issues such as who owns the information and liability. Early Contractor Involvement (ECI)

2. A new secondary option replaces the ECI clauses issued by NEC in 2015 for Options C & E and provides for a procurement process which enables the early engagement of a contractor.

3. Undertakings to Others

A new option to provide for collateral warranties.

4. Design Responsibility

Has been brought more into line with market standard drafting.

5. Contractor's Design Option

To support design and build by the contractor, with the intention of alignment with industry standards. Provisions include clauses relating to intellectual property and professional indemnity insurance.

6. Contractor's Proposals

This option supports gain share where the contractor has proposed a change to the Scope which has been accepted, and results in cost reduction.

10.1.10 More information on lessons learnt

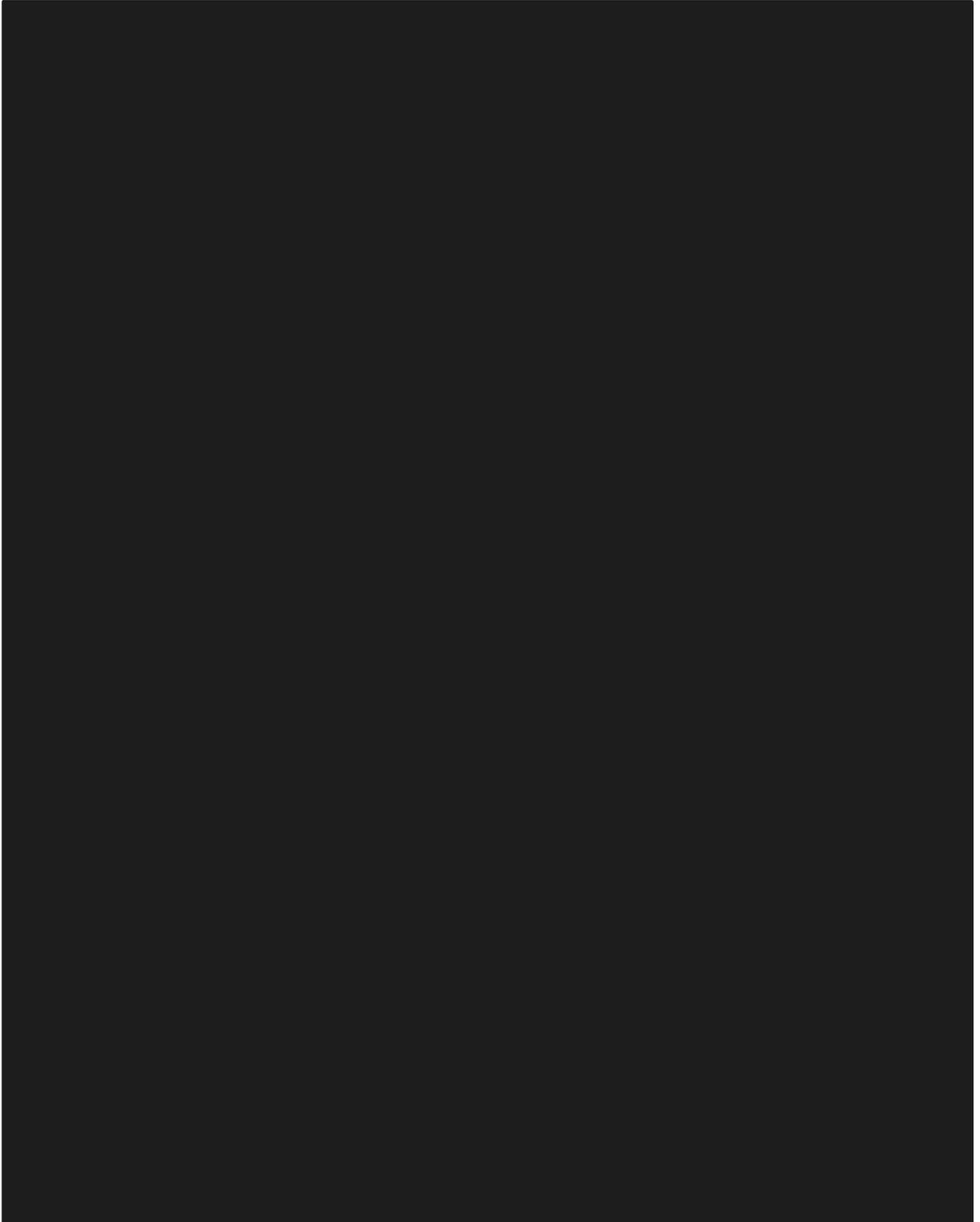
The following lessons are taken from Heathrow's DG0 document.

T2 and T5 Key learning summary

- The key learning from T5 which must be addressed in the expansion strategy is the critical importance of incorporating operations (both HAL and airlines) as part of the delivery process.
- Contractors worked in HAL on early design and worked up target costs prior to committing to the main construction contract. Responsibility for the design development and coordination (except the early stages) was owned by HAL on T5 with design risk managed through a programme level professional indemnity policy.
- A robust change management was implemented to control stakeholder' requests for change.
- A large number of commercial issues were stored up on T2 and emerged and claims at the end of the project.
- Extensive geotechnical surveys were carries out to reduce the risk of unforeseen ground conditions.
- Periodic independent peer reviews took place to address scope gaps.
- Both projects strove to maximise standardisation to enhance efficiency.
- The operational testing phase was not long enough and there was not enough engagement with the operational team before T5 went live.
- There were tensions in the business as the BAA T5 team became a separate organisation out with the wider BAA core team organisation, each with different objectives.
- The supply chain was too deep, leading to challenges with auditability, transparency and control.



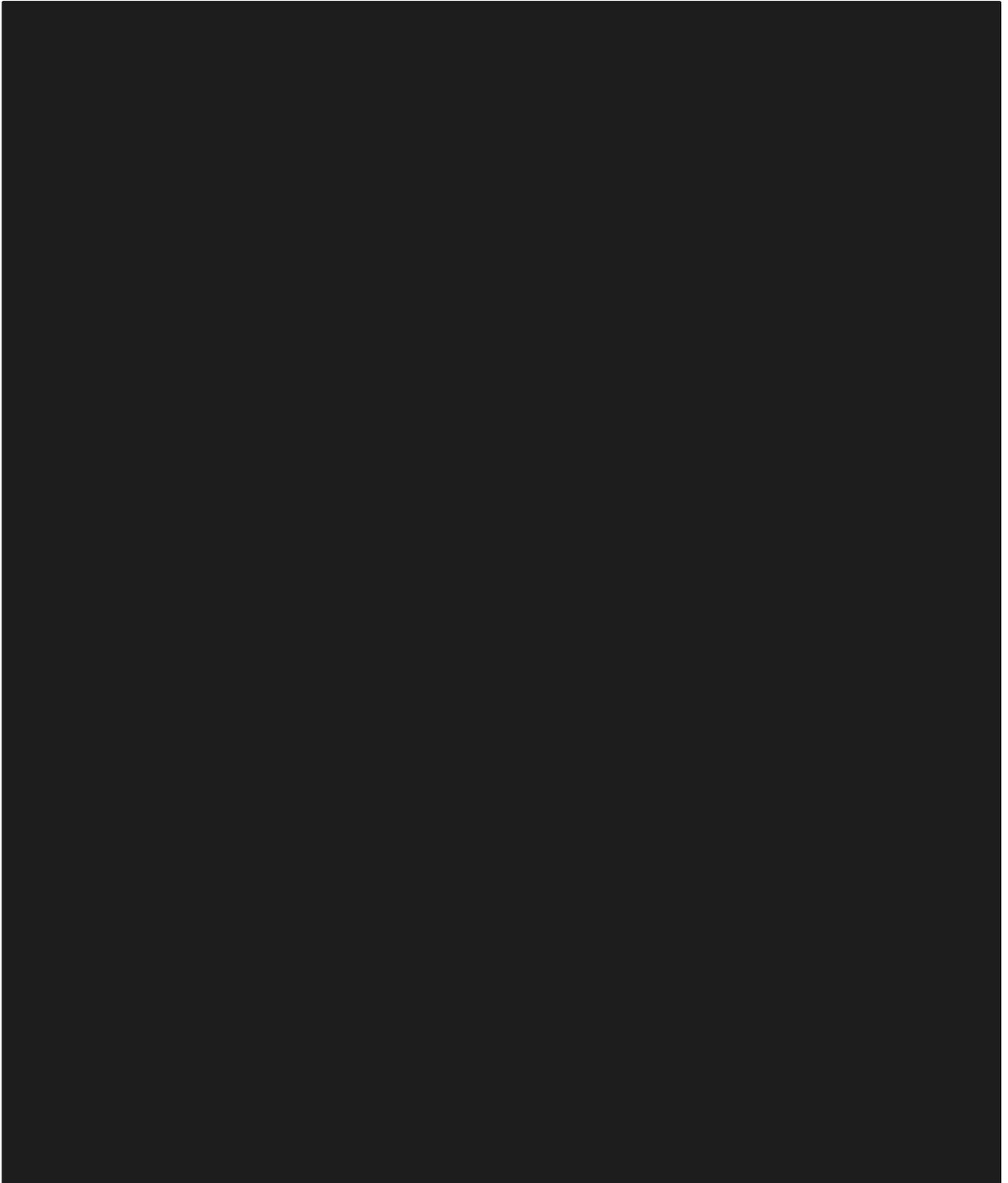
10.1.11 Heathrow's HEP SWOT and PEST Analysis



10.2 Documents Reviewed

CAA - HAL Procurement Review				
Ref	Item	Date Created	Publicity Status	Received
A	Procurement code of Practice	2014	Public Domain	Prior to kickoff meeting (17/04/18)
B	Procurement History plus Q6 Model	Jan-17	Internal HAL doc	Prior to kickoff meeting (17/04/18)
C	HEP Procurement Approach - statement-of-principles	Feb-17	Public Domain	Prior to kickoff meeting (17/04/18)
D	Procurement principles & capital estimating/benchmarks	May-17	Internal HAL doc	Prior to kickoff meeting (17/04/18)
E	HEP Procurement Plan (for Joint Expansion Board)	Sep-17	Internal HAL doc	Prior to kickoff meeting (17/04/18)
F	Procurement Strategy for expansion (Presentation)	Dec-17	Internal HAL doc	Prior to kickoff meeting (17/04/18)
G	Strategic Capital Business Plan	Apr-18	Public Domain	Prior to kickoff meeting (17/04/18)
H	Heathrow Expansion Overarching Procurement Strategy DG0 v1 Approved Final Oct15	Oct-15	Internal HAL doc	01/05/2018
I	Heathrow Hub Capacity Programme: Contracting Strategy - Exec Summary Part 1_21May_V	May-15	Internal HAL doc	01/05/2018
J	Heathrow Hub Capacity Programme: Contracting Strategy - DCO Phase Part 2_21May_V5	May-15	Internal HAL doc	01/05/2018
K	Heathrow Hub Capacity Programme: Contracting Strategy - Delivery Phase Part 3_21May_V	May-15	Internal HAL doc	01/05/2018
L	HEP Airline Procurement Enagagement Group Slides 050318	Mar-18	Internal HAL doc	01/05/2018
M	Procurement Forums Rev 4a	May-18	Internal HAL doc	10/05/2018
N	Expansion Supply Chain Communication	Sep-17	Internal HAL doc	10/05/2018
O	Construction Packaging strategy draft	Mar-18	Internal HAL doc	10/05/2018
P	Pre-construction - Early Works Procurement Packages draft	Mar-18	Internal HAL doc	10/05/2018
Q	Procurement Strategy DG0 draft	May-18	Internal HAL doc	10/05/2018
R	CAA Procurement Update	May-18	Internal HAL doc	10/05/2018
S	DfT Delivery report A3 Draft 1 march 2018	Mar-18	Internal HAL doc	16/05/2018
T	EXP2018002-PWPDF	Apr-18	Internal HAL doc	16/05/2018
U	Concept Architect DG1	Apr-15	Internal HAL doc	24/05/2018
V	IDT Task Order Creation	May-18	Internal HAL doc	30/05/2018
W	HEP Contract Tracker June 2018 v2a	Jun-18	Internal HAL doc	12/06/2018
X	Packaging structure v6d	Jun-18	Internal HAL doc	13/06/2018

10.3 Query Log and Responses





10.4 Arcadis Project Charter

ARCADIS PROJECT CHARTER

TECHNICAL ADVISOR TO THE CIVIL AVIATION AUTHORITY



Workstream	Initial Procurement Review	Estimated Cost	To be monitored based on T&M of Arcadis team
Arcadis Lead	Jonathan Edwards	CAA Lead Contact	Stuart Holder
Date from	09 April 2018	Date to	15 June 2018

Objectives	Deliverables		Critical Success Factors
<p>To provide the CAA with information about the current state of play in relation to HAL's procurement strategy for airport expansion</p> <p>Arcadis will provide the CAA with a summary of information relating to the maturity of the current Heathrow Expansion Programme (HEP) Procurement strategy.</p> <p>This is based on information provided by HAL's procurement team. Arcadis will provide commentary relating to the maturity of the procurement strategy relating to, but not limited to, the following anticipated items (depending on availability):</p> <ol style="list-style-type: none"> HEP procurement timeline, milestones & key interdependencies HAL's proposed packaging strategy and alignment to programme How procurement plan relates to Programme maturity How procurement relates to Programme finance-ability Alignment of Procurement strategy to 3R business/benefits case Commercial management & contracting strategy Relating procurement to HAL's intended use of existing procurement frameworks Whether HAL has given, or is likely to give, sufficient consideration to departures from its current Procurement approach (e.g. alternative commercial arrangements, involvement of different types of organisations, consideration of a terminal 'design & build' approach) 	<ul style="list-style-type: none"> Initial Draft Report for comment Final Report summarising Arcadis' findings and key observations to both CAA and HAL Presentational slide pack for CAA and HAL and other stakeholders based on scope of work and assessment 		<ul style="list-style-type: none"> Understanding HALs alignment of procurement activities to the masterplan and programme Availability of information from HAL to conduct a procurement review provided in a timely manner Access to and buy-in from HAL to answer relevant questions and to meet expectations Managing expectations and scope of work to align with information (maturity) available Availability of appropriate resource to ensure quality review in line with information available and stakeholders engaged
	In Scope	Out of Scope	Risks
	<ul style="list-style-type: none"> View of industry best practice for structure Review of the current stage of development (maturity of the procurement Strategy) Impacts of Public Procurement Regulations PCR's (OJEU) on timings 	<ul style="list-style-type: none"> Supply chain partnerships Commentary on market appetite Detailed benchmarking activities against other capital programmes Reviewing elements beyond programme delivery 	<ul style="list-style-type: none"> Lack of engagement by HAL to inform the scope of work to be completed by Arcadis. Information provided by HAL for procurement review is to high level and requires a number of assumptions Key personnel unavailable and/or unwilling to provide insight and answer relevant queries
	Resource Summary:		
	Who	Est. Required	
	<ul style="list-style-type: none"> Jonathan Edwards Kevin Nelis Sahir Rahim (SME) 	<ul style="list-style-type: none"> 1-2 days / week 3-5 days / week 1-3 days / week 	
	Reach-back & Peer Review		
	<ul style="list-style-type: none"> Simon Wright Will Lumsden 		<ul style="list-style-type: none"> 3-10 days (total)

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