

ARCADIS GUIDANCE TO THE CIVIL AVIATION AUTHORITY

HAL RBP UPDATE – CAPEX PLAN REVIEW

FINAL REPORT – 13th October 2021



Version Control

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Definitions

AMS	Amsterdam Airport (Schiphol)
CAA	Civil Aviation Authority
Capex	Capital Expenditure
H7	CAA's review of Heathrow's regulatory arrangements for the period 1 January 2022 – 31 December 2026 (the H7 period)
HAL	Heathrow Airport Limited
iH7	Interim H7
IBP	Initial Business Plan
IFS	Independent Fund Surveyor
OBR	Outcome Based Regulation
Opex	Operational Expenditure
RAB	Regulated Asset Base
RBP	Revised Business Plan
RPI	Retail Price Index
Update 1	The update to the RBP issued by HAL

1. Contents

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2. Executive Summary

The RBP Update (received by Arcadis on 16 July 2021) provided updates on the RBP Capex Plan published in December 2020. New market data and consumer research was included, and airline feedback addressed. The update was clearly presented, well articulated and used a sensible breakdown of portfolios.

However the update and associated documents did not provide the sufficient level of detail for a meaningful review to be conducted. We are confident that additional information regarding the H7 Capital Programme exists, for example on the basis of other evidence provided to CPB, and that further evidence and justification could have been provided to support HAL's RBP Update.

The basis of estimates included in the plan is not clear, the contents of each programme was not described nor were the outputs or benefits expected, and we understand from conversations with HAL that the maturity of the cost forecasts throughout is often very low.

As we were not able to come to a view on HAL's H7 plan based on the evidence supplied, we have conducted an high level review to determine whether or not the value of the forecast H7 capex envelope was in line with similar hubs in Europe, as well as a review of historic HAL CAPEX spend to understand if the proposals are reflective of historic performance when considered alongside other factors, such as the COVID pandemic.

From this exercise we have concluded that the "Optimal Plan" represents an increase in spend when compared to historic spend, which we would not expect given the impacts of COVID on the passenger forecasts. Furthermore it is not in line with the rest of the market.

The exercise also gave us some confidence in the overall quantum of the "Safety Only" plan, but we are still lacking the level of detail required to fully understand and justify HAL's plans for the H7 period.

Both the CAA in their Initial Proposals consultation document, and the airline community in their Airline Comments on the HAL RBP Update 1 Capital Plan document, dated 1st September 2021, came to similar views as those reflected in the above.

We have reviewed the CAA's proposed approach for the Initial Proposals and can confirm it to be a logical approach given the level of evidence provided by HAL to substantiate their own position.

3. Bottom-Up Analysis - Background

Arcadis has been appointed as a technical advisor to the Civil Aviation Authority; we initially undertook a “Bottom Up” analysis of the CAPEX elements of Heathrow Airport Limited’s Revised Business Plan [Update 1](#).

We have previously undertaken a review of HAL’s Revised Business Plan, which resulted in the following report being produced:

- **CAPEX REVIEW REPORT**

This report reviewed the Revised Business Plan chapters that related to CAPEX to understand the level of compliance with CAP1940 as well as the quality of information provided within.

Following these reports, in June 2021 HAL has produced [Update 1](#).

The purpose of Update 1 is to provide revised information following new market data and updated scenarios, including:

- Developments since RBP publication (including the continuation of the COVID-19 pandemic).
- Updated input from consumers.
- Updates to building blocks due to new market data and CAA/airline feedback.
- Updates to H7 framework proposals.
- Additional evidence.

Our Initial Recommendations were provided to the CAA on the 30th July 2021.

Our Final Recommendations were provided to the CAA on the 10th September 2021.

The Final Report was provided on the 5th October 2021.

3. Bottom-Up Analysis - Objectives

Arcadis, working on behalf of and closely with the CAA, has undertaken a review of HAL's Update 1 to assess at a high level:

1. Produce a high level, qualitative expert opinion on the overall coherence and quality of HAL's Updated Capex Plan with reference to good practice.
2. Develop an efficient Baseline Capex Plan consistent with the three demand scenarios referred to in HAL's RBP Update (assuming the "Low RAB Adjustment" financing scenario) based on HAL's Updated Capex Plan, specifically:
 - A. Assess whether or not projects included in the "Protect the Business" portfolio should form part of our Baseline Capex plan for IPs and hence are "essential projects".
 - B. Assess whether HAL's proposed "Protect the Business" plan meets the requirements of maintaining a safe and secure asset base (and review the estimates HAL has provided for cumulative lag behind investment curve).
 - C. Review HAL's proposed outputs and cost estimates for these essential projects.
 - D. Provide quantified advice on HAL's cost estimates for these projects, including recommended adjustments to the estimates, in a format consistent with relevant CAA models.
3. Recommend whether projects included in other portfolios in HAL's Updated Capex Plan should form part of our efficient Baseline Capex plan for IPs. For any such additional essential projects:
 - A. Review HAL's proposed outputs.
 - B. Provide quantified advice on HAL's cost estimates for these projects, including recommended adjustments to the estimates, in a format consistent with relevant CAA models.

3. Bottom-Up Analysis – Documents Reviewed

Arcadis were provided with Update 1 which consists of the following documents that we have reviewed:

- 1.0 Executive Summary.pdf.
- 2.0 Purpose of RBP Update 1.pdf.
- 3.0 Developments since publication of the December 2020 RBP.pdf.
- 5.3 H7 Capital Plan Updates.pdf.
- Appendix 6 - H7 Asset Management Plans.xlsx.
- Appendix 7 - Capital Programme Mandate One-Pagers.pdf.
- Appendix 8 - Capital Optimal Plan _ Level 2 Detail.xlsx.
- CAA-H7-498 - Engineering H7 Plan - RBP Update 1 June 2021.xlsx.
- CAA 23 September - RECONCILIATION - Asset Mgmt Plans.pdf.

3. Bottom-Up Analysis - Methodology


- Arcadis has completed our initial advice on baseline CAPEX and estimates.
- We have provided this initial advice in accordance with the objectives set by the CAA.
- The advice is presented in the following slides.
- Following our initial review, we have concluded that **we do not have sufficient information or detail** to complete the original objectives set by the CAA, therefore a review of the information available was provided and advice on how to proceed.
- A meeting with HAL and the CAA was held on the 9th August 2021 where further information was requested.
- Further information was received but it was not the level of detail required (no further request was made **at that time**), as such the objectives of this exercise are not achievable, however further work was commissioned to provide a review using an alternate methodology.
- The following slides provide more detail regarding the review.

3. Bottom-Up Analysis - Review

5.3 H7 Capital Plan Updates

- HAL has updated their RBP based on new information since publication in December 2020.
- New demand scenarios have been considered and are clearly presented.
- Two options for the capital plan have been developed, the “Optimal” and “Safety Only” plans.
- Detailed descriptions of the impacts HAL expects on the passenger journey have been detailed for each option.
- The updates to the RBP have been clearly articulated in terms of the reasoning behind the changes.
- Portfolios are broken down into programmes, and anticipated costs are provided.
- The methodology for how the estimates have been developed is not discussed in any detail in the RBP Update.
- The estimates appear to be largely high level.
- Even where projects are underway (or at an advanced stage of development), no detail has been provided of costs incurred or of bottom-up forecasts.
- The values presented in the RBP are difficult to reconcile with the data provided in Appendix 6.
- When asked about maturity of estimates we were informed that many were pre-Gateway zero and therefore no further information was available.

3. Bottom-Up Analysis - Review

- It is not clear as to how projects and programmes were categorised into the portfolios.
- The “Safety Only” option appears to contain projects that are not relating to safety.
- The text describes the option as:
 - A **Safety Only** plan – the minimum required to operate the airport safely in H7, which is the maximum that can be expected absent of a further adjustment to the RAB – that invests an average of only £490m p.a. in H7 – 42% lower than our historic capital run rate. This plan continues the trend of iH7 where we fall behind the curve of expectations and investments, while the gains of the last decade or more evaporate.
- However, this also does not appear to be the case as certain projects whilst perhaps sensible to complete, may not be required – for example:
 - 
- If HAL feel this is the minimum sensible spend - completing projects that are well underway, complying with new requirements, and safety, then it should be substantiated.



3. Bottom-Up Analysis - Review

- One example where we expect more detail is within the “Emerging Security Programme”.
- £420M of this spend is included in Protect the Business and £360M is in Win the Recovery, as shown in Table 10 of the RBP Update.
- Further information is provided in Appendix 7 (Capital Programme Mandate One Pagers) and shown on the right; however, it is very high level and lacking the detailed required to conduct a meaningful analysis.
- We are aware that elements of these works have a relatively high level of maturity so we would expect significant, robust information to be available to detail and justify the proposed spend.
- Options are presented in the RBP Update for security, but there is a lack of detail.
- Other programmes have even less information provided –

Table 10: Changes to H7 capital plan since RBP

		H7 Capital Plan - £ 2018p		
		RBP	RBP Update 1	Change
Protect the Business	Asset Management & Compliance	1,200	1,500	300
	iH7 roll-over (KAD/TTS, T3/T4 ramp up)		82	82
	T2 Baggage (prolongation)	180	180	0
	Regulated Security	420	420	0
	Protect Efficiencies	100	100	0
	Protect Revenues	100	100	0
	Carbon - Airspace Modernisation		38	38
	Crossrail Contribution	78	78	0
	Subtotal “Safety Only” plan	2,078	2,498	420
Win the Recovery	Security Compliance		230	230
	Security Transformation	130	130	0
	Commercial Revenues	600	600	0
	Efficient Airport	374	374	0

3. Bottom-Up Analysis - Review

- We understand that one aspect of the “Emerging Security Programme” is the upgrade of security lanes.
- From our benchmarking data from similar sized airports in Europe, we understand that a functional security lane using compliant scanning technology and full installation would cost approximately £1.5M.
- HAL have confirmed that 127 lanes are required to be installed during H7.
- Costs would therefore be expected to be up to a maximum of approximately £200M.
- The “Emerging Security Programme” is considerably more than that – so justification would be needed to understand if this is reasonable or not.
- Having had the trial lanes completed we imagine that there is significant pricing information that could be presented to substantiate HAL’s position.
- The airlines have conducted a similar analysis with a similar result in their “Airlines Views” document provided to the CAA on the 1st September 2021, under the incorrect assumption that 163 lanes would be required.

3. Bottom-Up Analysis - Review

Appendix 6 - H7 Asset Management Plans

It was not possible to reconcile the Asset Management appendix provided by HAL initially, with the main document.

In a meeting with HAL and the CAA on the 9th August 2021 HAL advised us that the file “H7 Asset Management Plans.xlsx “ was the incorrect version. Subsequently a revised version was provided. Unfortunately, the new version also did not reconcile with the H7 Capital Plan Updates document.

Following a meeting with HAL on the 24th September 2021 HAL provided a further document to demonstrate how the files should reconcile – this document more clearly demonstrated the linkage between the documents, however several of the adjustments in the process are not fully understood.

Our review of this further document is included in Appendix C.

3. Bottom-Up Analysis - Review

Appendix 6 - H7 Asset Management Plans

There are errors within formulae throughout the document that reduce confidence, for example:

In the electrical tab cells K31:M32 are not included in the sum function at the bottom of the page.



This results in the EAC column being £4m lower than it should be.

On the same sheet the below cells are also not included in the summation:



This results in the Total column being £50m lower than it should be. There are several other examples of this, and other areas included in our analysis in Appendix A.

3. Bottom-Up Analysis - Review

Appendix 6 - H7 Asset Management Plans

Where projects are continuing from iH7 we would expect the estimates to be of a higher level of detail, but that does not appear to be the case in many examples:



Some projects that are labelled iH7 appear not to have commenced – with their H7 spend matching their EAC, for example:



3. Bottom-Up Analysis - Review

Appendix 6 - H7 Asset Management Plans

There is no breakdown of the values presented – we do not know how the estimates have been calculated, or what has been included for. For example, projects are often phased in large round numbers over the period.



We understand that bottom-up estimating is not expected on projects in their early stages but would expect some understanding of how the above has been calculated.

3. Bottom-Up Analysis - Recommendations

Following the Arcadis review of the HAL RBP Update 1 documentation, we have concluded that there was not sufficient detail to provide a detailed Bottom-Up Analysis.

Without additional information it is not possible to determine:

- Whether HAL has used Best Practice in developing their CAPEX plan.
- If the projects have been correctly assigned to the relevant portfolio.
- How the estimates have been developed.
- The accuracy and level of confidence in the estimates.

With the above in mind Arcadis recommended a Top-Down Analysis should be conducted to provide a better understanding of how the overall values proposed in the RBP are comparable with the market and with historical trends.

4. Top-Down Analysis - Objectives

The following revised deliverables have been requested by the CAA:

- High-level advice on the efficient CAPEX baseline for H7, and corresponding estimates – developed in collaboration with the CAA.
- Advice on historical trends and benchmarks for HAL's own CAPEX spend with particular focus on spend on asset management activities.
- Advice on industry trends, insights and comparative evidence, including examples of recent and planned CAPEX at other comparable European hub airports, comparative cost benchmarks and industry expectations for CAPEX.

Additionally we were asked to complete the following which has been completed in later sections of this document:

- Review of key evidence, including all relevant HAL documents (including Update 1, the additional "Asset Management Plan", the relevant slides from the FPG meeting on 26 August) & the airline feedback on the CAPEX Plan: produce commentary on the quality and applicability of this evidence to the CAA process for developing Initial Proposals.

4. Top-Down Analysis – Documents Reviewed

- HAL Documents:
 - 1.0 Executive Summary.pdf
 - 2.0 Purpose of RBP Update 1.pdf
 - 3.0 Developments since publication of the December 2020 RBP.pdf
 - 5.3 H7 Capital Plan Updates.pdf
 - Appendix 6 - H7 Asset Management Plans.xlsx
 - Appendix 7 - Capital Programme Mandate One-Pagers.pdf
 - Appendix 8 - Capital Optimal Plan _ Level 2 Detail.xlsx
 - Regulated Accounts from 2014 – 2020
 - Strategic Capital Business Plans 2014 – 2020
 - H7 AMP FPG Extract Aug 21.pdf
- “Another Stretch Year For Europe's Airports”, S&P Global, 22nd March 2021
- “Business Model & Financial Outlook”, Groupe ADP
- “ACI World reveals capital expenditure needs for recovery and long-term growth”, ACI Press Release
- “Turnaround time: Airport financial recovery and restart following COVID-19”, ACI
- Gatwick Airport Results, June 2021
- “Economic Performance of the Airline Industry”, IATA
- Quarterly Report, Flughafen Wien AG
- “Fitch Downgrades Aeroports de Paris' to 'A-'; Outlook Negative”, Fitch Ratings
- “Fitch Rates Gatwick Airport Finance Plc's Notes 'BB-'; Outlook Negative”, Fitch Ratings
- “Fitch Affirms Brussels Airport Company at 'BBB+' / Negative”, Fitch Ratings
- CAA Draft Board Slides (Confidential)

4. Top-Down Analysis - Methodology

We have presented all figures in 2020 prices, and we have used CPI to adjust historic figures. The following sources of information have been reviewed:

- HAL's Regulated Accounts from 2014 – 2020
- HAL's **Safety Only** Scenario for 2022 – 2026
- HAL's Strategic Capital Business Plans 2014 – 2020

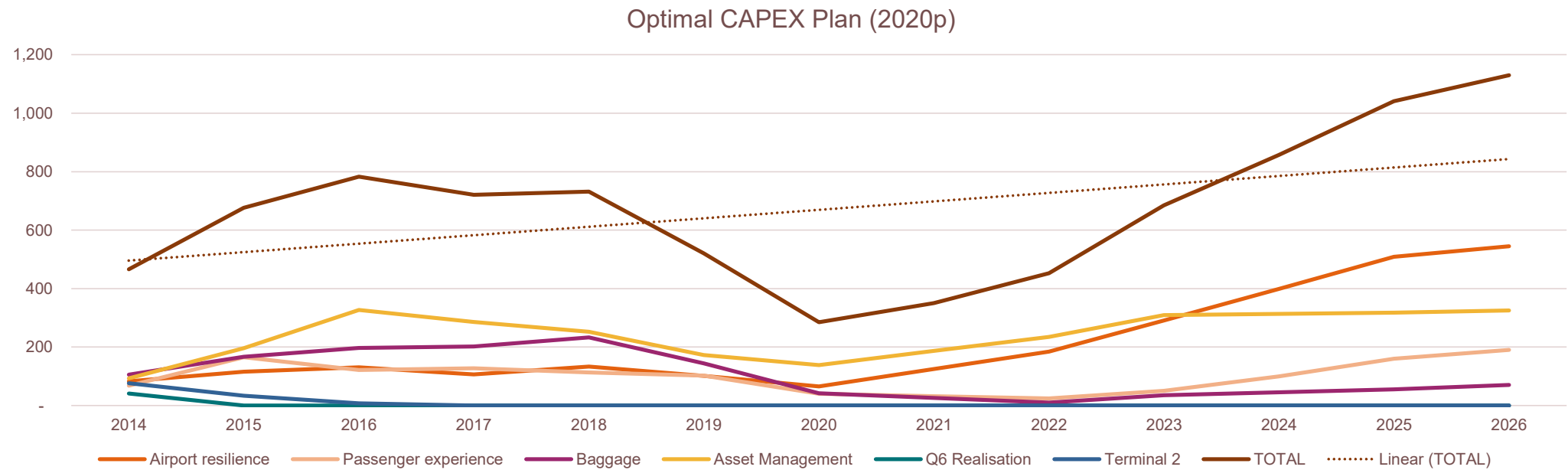
We have assumed:

- **Passenger Experience** projects are non-essential
 - For example, *B024 Commercial Advertising and Sponsorship*
- **Airport Resilience** projects are non-essential
 - For example, *B409 MSCP 4*
- **Asset Management** projects are essential
 - For example, *B303 IT Asset Replacement*
- **Baggage** projects, except for the T2 Baggage Programme, are non-essential
 - For example, *B442 T4 Baggage Out of Gauge Reclaim*
- Due to differences in the structuring of the data, assumptions have been made regarding which portfolios of work the RBP projects most appropriately fit into.
- Further to the historic analysis we have reviewed available information from comparable airport operators to determine if HAL's proposals are in line with the wider market view.

4. Top-Down Analysis - Review

The below time series have been produced using:

- HAL's Regulated Accounts from 2014 – 2020.
- HAL's **Optimal** Scenario for 2022 – 2026.
- Assumptions regarding the categories the items in the RBP Update fall into, as they do not align.

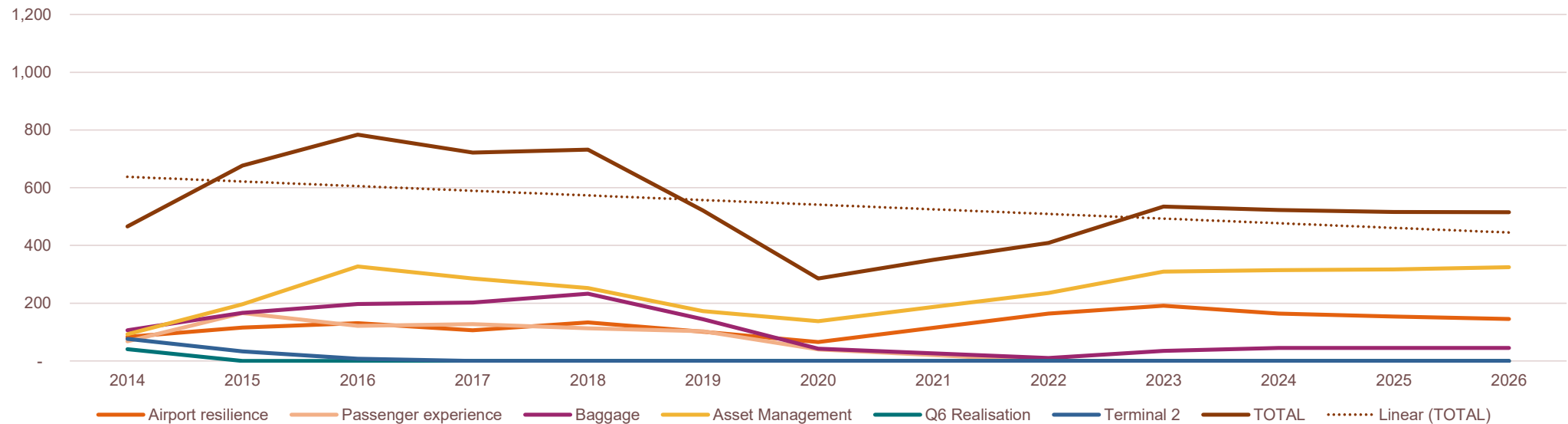


4. Top-Down Analysis - Review

The below time series have been produced using:

- HAL's Regulated Accounts from 2014 – 2020.
- HAL's **Safety Only** Scenario for 2022 – 2026.
- Assumptions regarding the categories the items in the RBP Update fall into, as they do not align.

Safety Only CAPEX Plan (2020p)

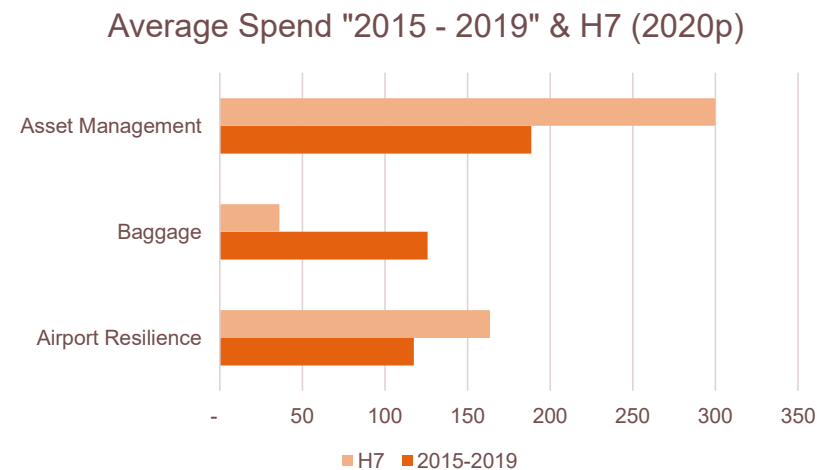


4. Top-Down Analysis - Review

The Asset Management and Airport Resilience spend proposed by HAL for H7 is significantly higher than in previous years.

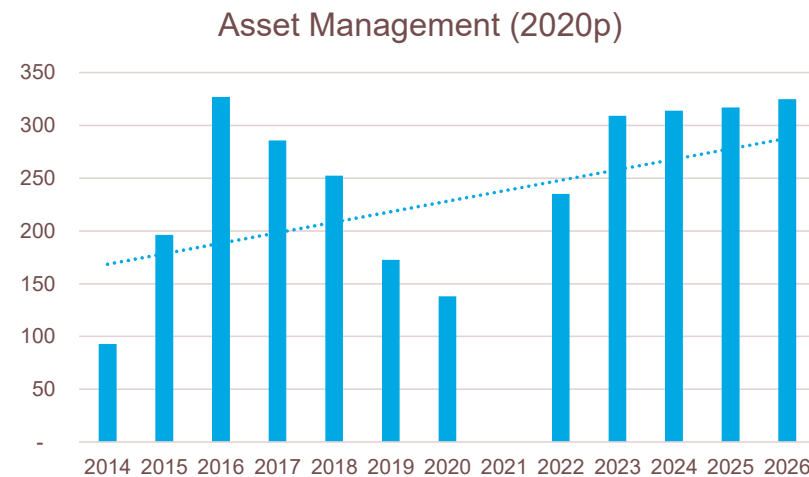
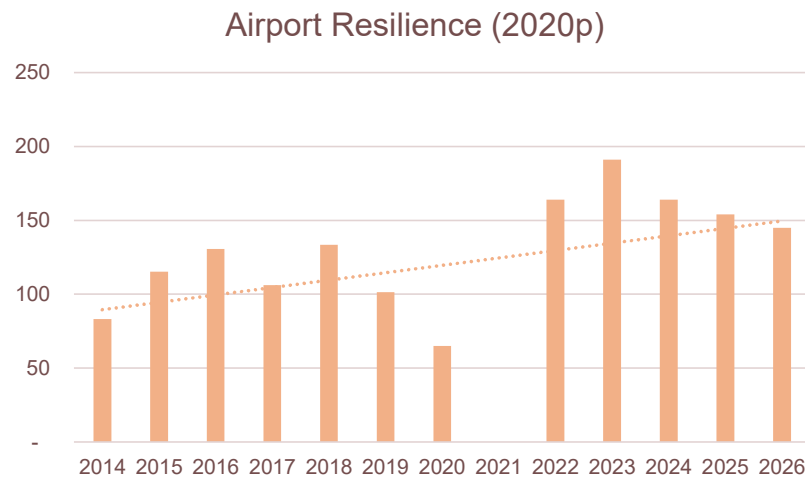
We understand there may be some deficit to make up due to lower spend on asset management activities in 2020 and 2021 (due to rationing of CAPEX), but the significant increase requires further explanation.

The plan shows a substantial reduction in baggage projects reflective of previous major projects being completed, justification of ongoing projects in the “Safety Only” would required further justification regarding safety issues.



4. Top-Down Analysis - Review

Utilising this high-level information, we would expect the H7 “Safety Only” plan to be more closely aligned to historic trends, rather than increases in Asset Management and Airport Resilience:



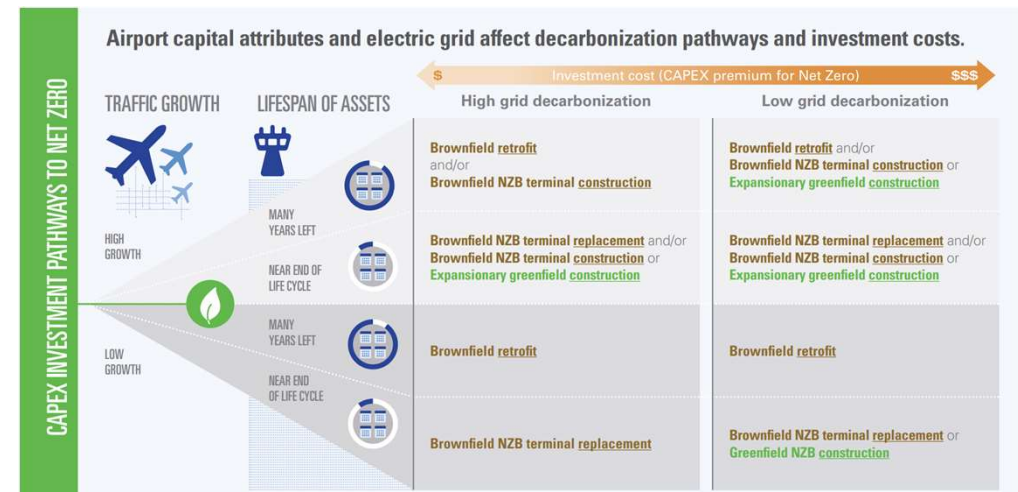
The above graphs have been compiled using HAL’s regulated accounts for years 2014 – 2020, and HAL’s Safety Only plan from their RBP Update for years 2022 – 2026.

4. Top-Down Analysis - Review

It is understood that there will be several items that will cause an increase in CAPEX spend over the coming years, such as:

- A “Backlog of asset management needs”, i.e. the additional costs that will be incurred to bring the assets that have been neglected throughout the pandemic back to a reasonable standard.
- The Net Zero Carbon goal requirements (see infographic from ACI).
- The agreed contribution to Cross Rail.
- Increased security requirements from the Department for Transportation.

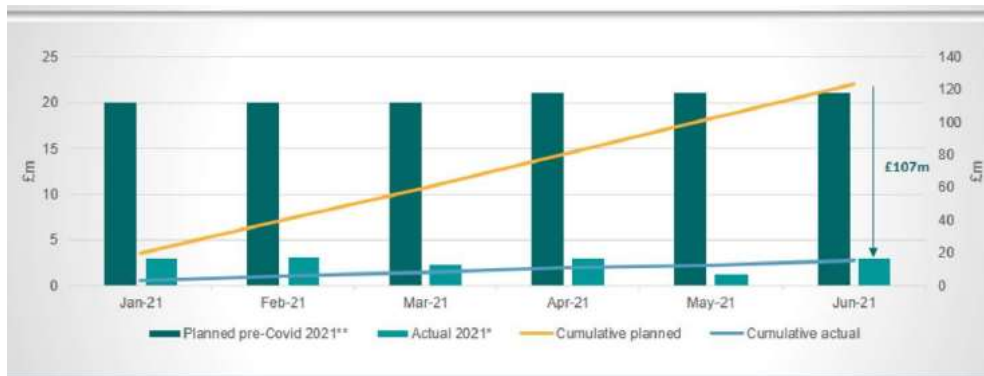
We consider costs associated with the above reasonable, however the quantum and make up of those costs need to be better evidenced.



4. Top-Down Analysis - Review

Multiple examples of CAPEX being reduced across the European airports:

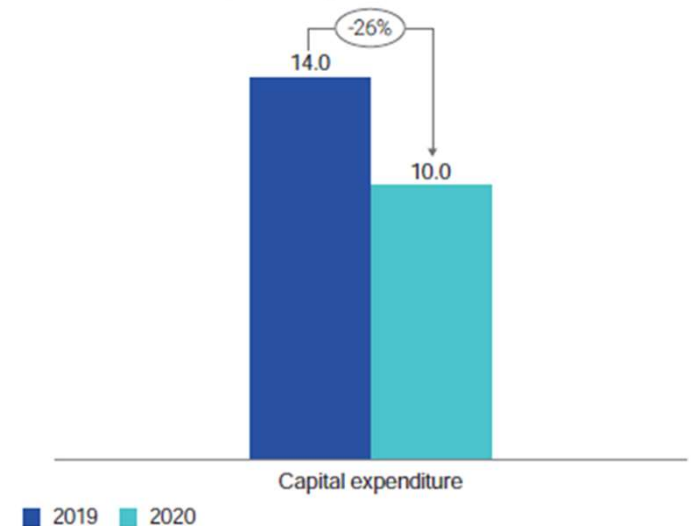
- Europe-wide: According to ACI, and as seen in the graph on the right, airports across Europe have made significant reductions to CAPEX spend.
- Schiphol: 25% reduction of expenditure on capital projects (compared to original plans) and 21% compared to 2019 levels. “Our company wide cost management programme continues to ensure delivery of our cost reduction targets of 25% in 2021-2022 and our capital expenditure will remain strictly controlled” Royal Schiphol Group, 19th February 2021.
- Brussels: “We assume CAPEX to remain at a minimum, significantly reducing expansionary CAPEX from 2021 - 2023 to protect the financial profile of BAC while traffic recovers and increasing to around EUR250 million by 2024.” Fitch Ratings – Madrid, 31st March 2021.
- Aéroports de Paris: CAPEX expected to fall to €850M in 2021, from pre-COVID levels of €1.2Bn.
- Gatwick: Per the diagram below, investment levels remain significantly lower than planned pre-COVID.



includes additions relating to right of use assets
2021 planned investment levels are derived from the published 2019 CAP with annual investment allocated evenly by month.

THE OVERWHELMING FIRST ACTION OF AIRPORTS WAS TO POSTPONE, REDUCE OR DEFER INVESTMENT IN ALL BUT ESSENTIAL CAPITAL PROJECTS

2019-2020: Capital expenditure (€ Billion)



Source: ACI EUROPE Economics Survey

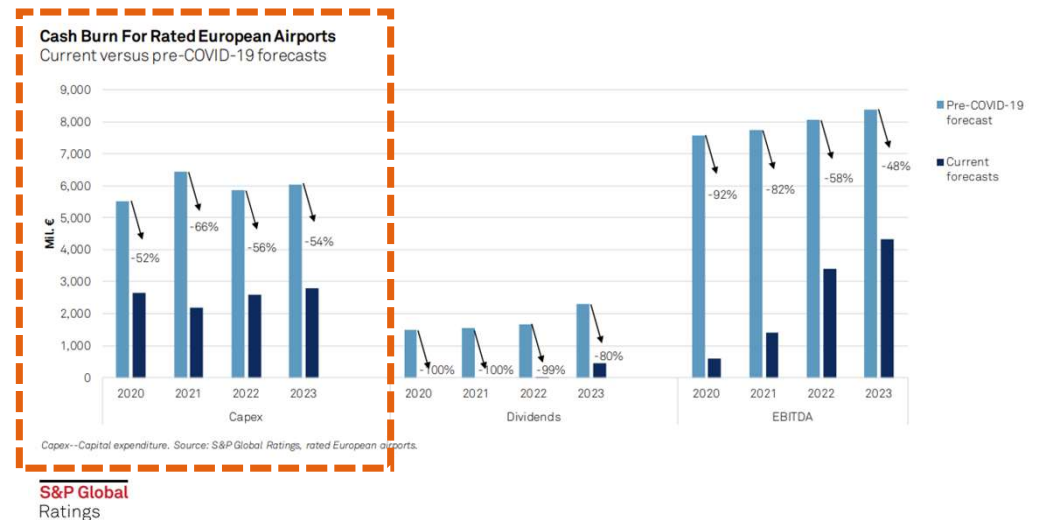
4. Top-Down Analysis - Review

The highlighted chart on the right from S&P Global, provides more evidence that most Europe airports are not anticipating a return to Pre-COVID levels of capital spend in the short term.

The chart shows large reductions on plan with a cautious increase through until the end of 2023.

We would expect that increase to accelerate after that, but in line with previous airport specific data, not reach pre-COVID levels until 2025 or beyond.

Airports Cutting Capex Due To Low-for-Longer Passenger Scenario



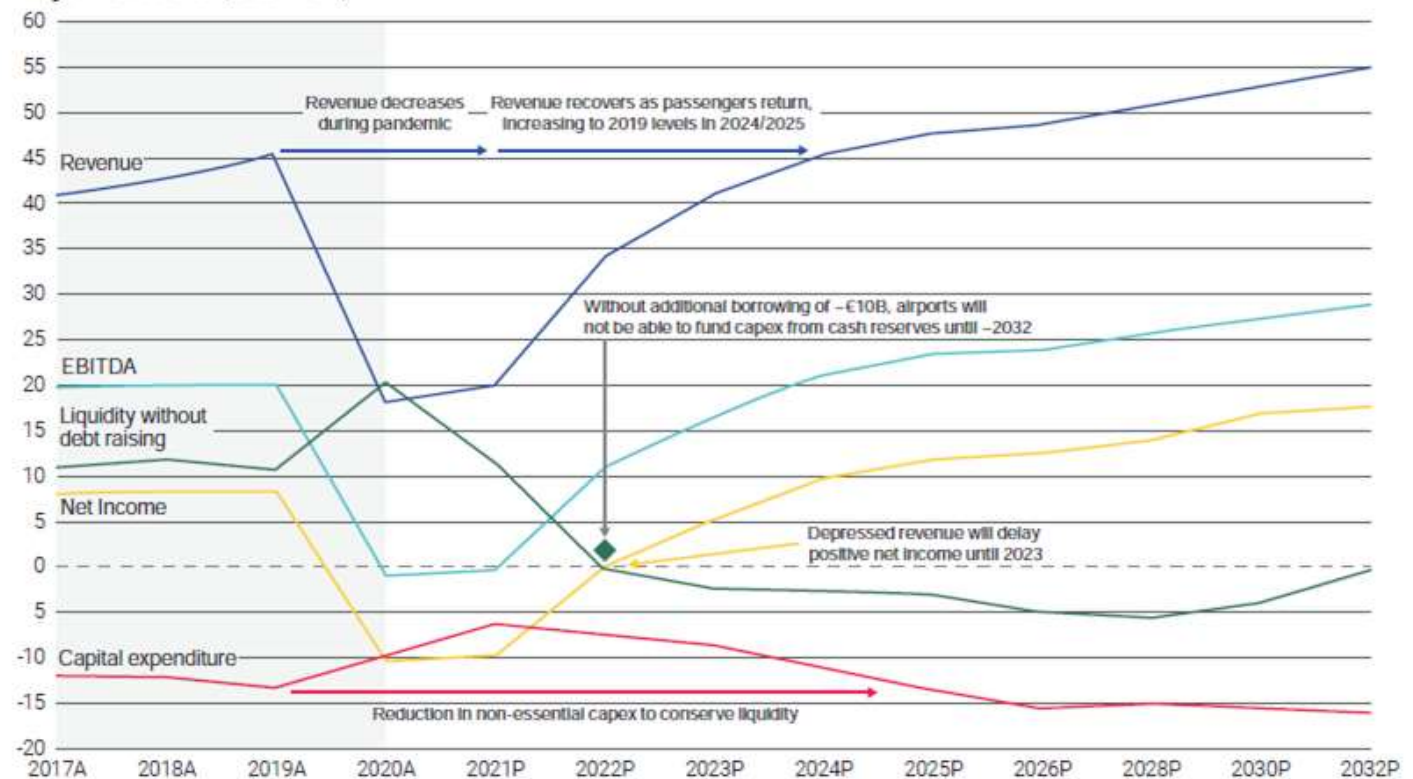
4. Top-Down Analysis - Review

According to ACI: Fully reopening terminals and generally restarting as traffic returns will result in higher costs but still low revenues, meaning greater cash burn in the second half of 2021. As a result, European airports will not generate sufficient profits to meet capital expenditure and capital costs from net income until at least 2032.

Looking ahead, key themes include long-term initiatives in digitalisation, automation, and sustainability, rather than increasing capacity. However, the immediate focus remains on maintaining the airport to be ready for restart and, in the medium-term, a focus on protecting recovery efforts.

CAPEX AND A LACK OF LIQUIDITY WILL FORCE AIRPORTS TO RAISE MORE DEBT IN 2023, WITH LIQUIDITY NOT EXPECTED TO BE POSITIVE UNTIL 2023

Key financials (€ Billion)



Source: ACI EUROPE Economics Survey, IATA, IMF, AlixPartners analysis

4. Top-Down Analysis - Recommendations

Following the Arcadis review of the HAL information available in the public domain, as well as market intelligence from comparable European hub airports it is concluded that:

- HAL's "Optimal" plan represents an increase in historic spend that would need significant further justification given the continuing impacts of COVID on passenger numbers.
- This plan does not reflect the view of the wider market who by and large do not see a recovery in CAPEX spend until late in the period covered by the H7 review.
- The "Safety Only" plan is more in line with historic spends as well as the market view – with HAL's spend between 2014 and 2020 averaging £520M annually, compared with the £500M annually forecast in their "Safety Only" plan.
- Whilst the Top-Down analysis has provided some confidence in the "Safety Only" plan significant questions remain regarding the content of the Updated Business Plan, in terms of cost estimates for individual programmes.

5. Review of CAA Methodology*

Since our appointment to review the HAL Revised Business Plan Update 1, we have worked collaboratively with the CAA in the reviewing of documents with regular weekly catch ups to discuss out progress and findings.

We have reviewed the documentation provided by HAL and used the information we have, though lacking in detail as previously described, to understand what should and should not be included within the H7 envelope.

6. Airline Comments

Arcadis has reviewed the document issued by David Hill, Head of Regulation and Strategy Heathrow - AOC Limited, on the 1st September 2021 titled “Airline Comments on the HAL RBP Update 1 Capital Plan”.

Introduction

We do not have any comments on the “Introduction” as it deals with several areas outside the scope of this report.

Capital Plan

The “Capital Plan” details the concerns of the airlines that the RBP and subsequent Update “lacked the requisite detail”, which is something that we agree with and is reflected throughout this document.

The view is expressed that the “one pagers” are insufficient to justify the level of spend that they represent, again something that we agree with and have commented on within this document.

Comment is provided that the proposed future spend is over £1Bn more than the Q6 period – this aligns with our previous commentary on the historic analysis.

Protect the Business

This section provides a commentary on a programme level using information that we are not a party to, such as gateway approvals, detailed understanding of the existing infrastructure and operational knowledge that we cannot comment on. Arcadis believes that the HAL RBP and Update should have been substantiated in such a way that such existing knowledge should not have been required to be able to make a meaningful review of the document.

In addition, several points are raised that echo our findings, such as the questioning of the rollover projects, the contents of the high value security programmes and the concern over how projects have been assigned to certain scenarios.

6. Airline Comments

Win the Recovery & Build Back Better

These sections are approached in a similar way to Protect the Business and similar conclusions are arrived at.

Airline Plan

The airlines have used their own understanding of programmes to produce their own views on the validity of projects to be within H7.

However, it was made clear in our meeting with the airlines on the 2 September 2021, that whilst they may approve the notion of certain programmes being included in certain scenarios or portfolios, they do not have visibility or confidence in the level of cost.

From Arcadis' point of view, we do not believe that the airlines should have to use their own intimate knowledge of the airport and its operations to provide justifications for HAL's plans. However, their "Airline Plan" roughly aligns with the findings of Arcadis and the CAA in their "Mid Case", although we note that the methodology for developing all those three estimates is not the same.



Appendix A – Errors and Inconsistencies in H7 Asset Management Plan

- The initial document issued was incorrect, however the revised document was similarly difficult to reconcile with Update 1.
- The detail on the right describes the errors and inconsistencies found by our team in the H7 Asset Management Plan document.
- We were not able to directly correlate the information provided in RBP Update 1 with the information in the Asset Management spreadsheet.



Appendix B – Questions asked of HAL

Query No.:	Query:	Response:	Arcadis View:
1	What criteria were used to determine the portfolio in which each project or programme lies?	Programme Mandates benefits and outcomes – each Portfolio has common objectives and similar levels of risk and controllability	<p>This does not provide us with enough information to give confidence that the projects have been correctly assigned to a portfolio.</p> <p>One example are the "Continue" investments <£10m, totalling a £418M spend over H7. The benefits and outcomes, objectives, risk and controllability do not seem to have played a part in the assignment to the "Safety Only" plan.</p> <p>We would expect a documented governance process for each project to show that a determination had been made as to where it should lie.</p>
2	Have the cost estimates (and any corresponding business case analysis) for the projects and programmes included in your Capex Plan (Section 5.3) been developed in accordance with relevant guidance and governance documents, such as the HAL "Portfolio Definition & Budget Development Process"? if so, which "technique" was used for each project or programme in developing the estimates?	We are at pre-G0 for the portfolio development, once the settlement is finalised we will implement the Portfolio Definition and Budget Development Process Evidence supplied to the CAA related to Protect the Business Portfolio	<p>How "pre-G0" estimates are arrived at has not been explained – we would expect a standardised methodology and sign off process.</p> <p>We would also expect numerous projects within the RBP Update to have progressed past "pre-G0", that information, where available should be presented.</p>
3	Please indicate the level of maturity of each of the projects or programmes included in your Capex Plan, in accordance with the HAL Gateway process: • in particular, please identify which projects or programmes have successfully passed through the G3 Gateway	7% of the Optimal Plan is Core (2021 prices) We have relatively well defined scope and costs for 35% of the Optimal Plan (2021 prices)	The 35% have not been identified within the RBP or Update 1. So we cannot assess how robust the proposed costs are.
4	Please provide further explanation on the "Asset Management Plan" (Appendix 6), including the overall structure of the analysis presented, and the linkages to your asset management (AM) strategy (or similar documents), and explain how your overall AM strategy has been translated into an AM plan.	We will arrange a follow up session with the Asset Management Plan to go through the detail, see slide 16 for risk assessment process	<p>The follow up session was organised, however HAL did not appear to be overly familiar with the document.</p> <p>Subsequently a reconciliation has been issued – this goes some way to linking the two documents, however it is still not clear on the adjustments being made to make the figures match.</p>

Appendix B – Questions asked of HAL

Query No.:	Query:	Response:	Arcadis View:
5	Please demonstrate how the values supplied in Appendix 6 reconcile with the cost estimates presented in Section 5.3.5.1	Asset Management plans shared relate to RBP, RBP Update 1 Appendix to be reshared with Update 1 Asset Management plans (see following slide)	See response to Query 4.
6	Please provide the cost estimates and supporting narrative for the projects that together comprise the “Asset Management & Compliance” projects, an estimated total of £1,500m of expenditure in H7.	Asset Management Plans	This document provides a list of the projects, but no narratives or estimates have been provided.
5	Reconciliation between AM plans shared which related to the RBP, and the Asset Management plans which support the RBP Update 1 – to be shared post meeting		See response to Query 4.
7	What criteria were used to assess whether iH7 projects should be suspended, cancelled or continued? • what analysis did you carry out to assess which iH7 roll-over projects should be included in your Capex Plan?	Assessment as per the FPG discussions had throughout 2020 and 2021 Those that Continue either meet the criteria for Protect the Business, or would be highly cost ineffective to suspend or cancel	The slide shows any Post G3 project, involving critical assets, <£1M will continue. That seems logical, however it is not clear as to exactly how the “critical asset” criterion has been assessed. I.e. are all these projects essential to the functioning of critical assets, or are critical assets simply in some way involved in the project.
8	What cost breakdown structure have you used to develop cost estimates for the projects and programmes in your Capex Plan?	Continue Projects are based on actual cost breakdowns Remaining items based on forecast allocations	This response does not answer the question as to which CBS was used.

Appendix C – Reconciliation of the Asset Management Plan

The **red** highlighted box shows the figures originally issued by HAL.

The **blue** highlighted box shows figures also contained within the original Asset Management plan but stated to be in 2022 prices.

The differences were explained due to different base years used for pricing.

It is not clear what the “disc error” refers to.

RBP Update 1 Appendix – Reconciliation Step 1

Protect the Business	Engineering H7 Plan - Current					2018 Prices	2018p adjusted - disc error	2018p Update 1	Plans shared with the CAA for Update 1
	2022	2023	2024	2025	2026				
Asset Information	£4.8m	£5.9m	£4.6m	£2.7m	£2.7m	£20.8m	£0.5m	£21.4m	£22.8m
Civils	£82.6m	£138.3m	£113.3m	£164.1m	£74.8m	£573.2m	£14.7m	£587.9m	£626.4m
Electrical	£28.6m	£14.6m	£11.2m	£7.3m	£0.9m	£62.6m	£1.6m	£64.2m	£68.5m
Environment	£14.5m	£18.4m	£9.2m	£7.3m	£0.5m	£49.9m	£1.3m	£51.2m	£54.5m
IC&A	£14.0m	£29.4m	£26.6m	£15.7m	£6.9m	£92.7m	£2.4m	£95.1m	£101.3m
Mechanical	£16.7m	£49.9m	£94.8m	£70.1m	£30.8m	£262.3m	£6.7m	£269.0m	£286.6m
Baggage	£80.3m	£38.9m	£23.2m	£18.7m	£46.8m	£207.9m	£5.3m	£213.3m	£227.2m
Rail	£28.0m	£16.6m	£11.2m	£23.0m	£52.9m	£131.6m	£3.4m	£135.0m	£143.9m
T1 Prolongation	-	-	-	-	-	-	-	-	-
Multifarious	-	-	-	-	-	-	-	-	-
Total	£269.6m	£312.1m	£294.1m	£309.0m	£216.4m	£1,401.1m	£36.0m	£1,437.1m	£1,531.2m
Cyber & Technology	£64.5m	£72.4m	£61.8m	£50.8m	£49.9m	£299.3m	£7.7m	£307.0m	£327.1m
Total	£334.1m	£384.4m	£355.8m	£359.8m	£266.2m	£1,700.4m	£43.7m	£1,744.1m	£1,858.3m
Prioritisation	(£94.1m)	(£144.4m)	(£115.8m)	(£119.8m)	(£26.2m)	(£500.4m)	(£43.7m)	(£544.1m)	(£579.7m)
Total	£240.0m	£240.0m	£240.0m	£240.0m	£240.0m	£1,200.0m	-	£1,200.0m	£1,278.5m

The original appendix submitted was assuming the asset management plans was in 2022p, instead of 2021p hence £43.7m difference should be added back.

The Asset Management plan in nominal prices (2021p) should have been £1.28bn

Appendix C – Reconciliation of the Asset Management Plan

The **green** highlighted box shows the figures issued by HAL in their revised document.

The differences were explained as being due to different base years used for pricing.

It is not clear what the “changes to plan” refers to, or why it is in 2022 prices.

It is not clear what “Adjustment Pricing” is.

The index used for conversion between 2021p and 2018p in the final two columns seem to be inconsistent for “Cyber & Digital” and “Prioritisation”, as shown in the lower table to the right.

The **orange** highlighted box shows the final figures that now reconcile with the main document.

RBP Update 1 Appendix – Reconciliation Step 2

Protect the Business	Plans shared with the CAA for Update 1	Changes to Plan	Latest AM Plan	Adjustment Pricing	Latest AM Plan	RBP Update 1
	2021p	2022p	2021p	2021p	2021p	2018p
Asset Information	£22.8m	(£4.5m)	£18.3m	£0.1m	£18.4m	£17.2m
Civils	£626.4m	£156.3m	£782.7m	(£3.9m)	£778.8m	£731.0m
Electrical	£68.5m	£36.4m	£104.9m	(£0.9m)	£104.0m	£97.6m
Environment	£54.5m	£28.7m	£83.2m	(£0.7m)	£82.5m	£77.4m
IC&A	£101.3m	£31.0m	£132.3m	(£0.8m)	£131.5m	£123.4m
Mechanical	£286.6m	(£3.9m)	£282.7m	£0.1m	£282.8m	£265.4m
Baggage	£227.2m	(£9.8m)	£217.4m	£0.2m	£217.6m	£204.3m
Rail	£143.9m	(£65.0m)	£78.8m	£1.6m	£80.5m	£75.5m
T1 Prolongation	-	-	-	-	-	-
Multifarious	-	£72.0m	£72.0m	(£1.8m)	£70.2m	£65.9m
Total	£1,531.2m	£241.1m	£1,772.2m	(£6.0m)	£1,766.2m	£1,657.7m
Cyber & Digital	£327.1m	(£15.4m)	£311.7m	£0.8m	£312.5m	£291.6m
Total	£1,858.3m	£225.7m	£2,083.9m	(£5.2m)	£2,078.8m	£1,949.3m
Prioritisation	(£579.7m)	£106.2m	(£473.5m)	(£2.7m)	(£476.2m)	(£449.3m)
Total	£1,278.5m	£331.9m	£1,610.4m	(£7.9m)	£1,602.5m	£1,500.0m

£1.6bn is what we shared as being the latest AM plan

The latest Plan in correct 2021p results in £1.602bn, £7.9m difference from what was shared

The latest Plan in 2018p results in £1.5m with a Pressure of £449m in H7 as per the RBP Update 1 shared with the CAA

	2021 Prices	2018:2021	2018 Prices	RBP Update 1	
Asset Information	£ 18,400,000.00	1.065435653	£ 17,269,930.80	£ 17,200,000.00	99.6%
Civils	£ 778,800,000.00	1.065435653	£ 730,968,592.57	£ 731,000,000.00	100.0%
Electrical	£ 104,000,000.00	1.065435653	£ 97,612,652.32	£ 97,600,000.00	100.0%
Environment	£ 82,500,000.00	1.065435653	£ 77,433,113.62	£ 77,400,000.00	100.0%
IC&A	£ 131,500,000.00	1.065435653	£ 123,423,690.19	£ 123,400,000.00	100.0%
Mechanical	£ 282,800,000.00	1.065435653	£ 265,431,327.66	£ 265,400,000.00	100.0%
Baggage	£ 217,600,000.00	1.065435653	£ 204,235,703.32	£ 204,300,000.00	100.0%
Rail	£ 80,500,000.00	1.065435653	£ 75,555,947.23	£ 75,500,000.00	99.9%
Multifarious	£ 70,200,000.00	1.065435653	£ 65,888,540.32	£ 65,900,000.00	100.0%
Total	£ 1,766,300,000.00	1.065435653	£ 1,657,819,498.03	£ 1,657,700,000.00	100.0%
Cyber & Digital	£ 312,500,000.00	1.065435653	£ 293,307,248.56	£ 291,600,000.00	99.4%
Total	£ 2,078,800,000.00	1.065435653	£ 1,951,126,746.59	£ 1,949,300,000.00	99.9%
Prioritisation	-£ 476,200,000.00	1.065435653	-£ 446,953,317.65	-£ 449,300,000.00	100.5%
Total	£ 1,602,600,000.00	1.065435653	£ 1,504,173,428.94	£ 1,500,000,000.00	99.7%