Review of H7 Opex and Commercial Revenues: Initial Assessment and Forecasts

Final report (REDACTED)

Civil Aviation Authority

13th October 2021

Important Information

This document was prepared by CEPA LLP (trading as CEPA) and Taylor Airey for the exclusive use of the recipient(s) named herein.

The information contained in this document has been compiled by CEPA and/or Taylor Airey and may include material from other sources, which is believed to be reliable but has not been verified or audited. Public information, industry and statistical data are from sources we deem to be reliable; however, no reliance may be placed for any purposes whatsoever on the contents of this document or on its completeness. No representation or warranty, express or implied, is given and no responsibility or liability is or will be accepted by or on behalf of CEPA or by any of its directors, members, employees, agents or any other person as to the accuracy, completeness or correctness of the information contained in this document and any such liability is expressly disclaimed.

The findings enclosed in this document may contain predictions based on current data and historical trends. Any such predictions are subject to inherent risks and uncertainties.

The opinions expressed in this document are valid only for the purpose stated herein and as of the date stated. No obligation is assumed to revise this document to reflect changes, events or conditions, which occur subsequent to the date hereof.

CEPA does not accept or assume any responsibility in respect of the document to any readers of it (third parties), other than the recipient(s) named herein. To the fullest extent permitted by law, CEPA will accept no liability in respect of the document to any third parties. Should any third parties choose to rely on the document, then they do so at their own risk.

Contents

Executive Summary 4

1. Introduction 40

2. Review of HAL's overall forecasting approach 45

3. Opex forecasts 52

- A. Efficiency of 2019 figures as a baseline
- B. Elasticities
- C. People
- D. Operational costs (incl. Insurance)
- E. Facilities and Maintenance
- F. Rates, Utilities and Distribution Contract
- G. Surface access initiatives
- H. Frontier shift and input price inflation
- I. Capital investment
- J. Overall results

4. Commercial revenue forecasts 131

- A. Efficiency of 2019 figures as a baseline
- B. Elasticities
- C. Retail
- D. Surface access
- E. Property
- F. Other non-aeronautical revenues
- G. Cargo revenues
- H. Capital investment
- I. Overall results

Executive Summary

Our terms of reference

The next price control for Heathrow Airport Limited (HAL) – H7 – is due to run from 1st January 2022 to 31st December 2026.

The Civil Aviation Authority (CAA) is now in the process of assessing HAL's Revised Business Plan (RBP) for H7, submitted in December 2020, and the updated version ("Updated RBP") provided on the 1st July 2021 (received part way through the preparation of this report).

The CAA have commissioned CEPA and Taylor Airey to assist it with its assessment of HAL's forecasts of operating expenditure (opex) and commercial revenues – and in determining an alternate set of forecasts where appropriate.[1]

The COVID-19 pandemic remains the biggest issue facing the aviation sector in the UK and globally and is expected to continue to have significant impacts on Heathrow airport's operations during H7 even as governments worldwide start to reduce travel restrictions. This means that the H7 price review is being undertaken in a context of considerable forecasting uncertainty.

Our approach

We have assessed the approach taken and rationale given, both by HAL and by its advisors, for the opex and commercial revenue forecasts and supporting assumptions in the RBP and Updated RBP. We assessed the information in the RBP and Updated RBP 'as seen' and with reference to other situations including our understanding of regulatory precedent, passenger behaviour, and the market and economic factors in play. Our engagement with HAL has been limited to simple clarifications during this first stage of the process. But we expect more in-depth engagement with HAL on the issues raised in this report and on issues raised by HAL, following the publication of the CAA's Initial Proposals.

We have sought to take account of the unprecedented circumstances and the high degree of forecasting uncertainty affecting the H7 price review by following a similar methodology as HAL and directly assessing the overlays and adjustments that HAL itself has identified as impacting its business during H7 (relative to a starting 2019 'baseline' of operating costs and commercial revenues).

This approach has ensured our review of HAL's opex and commercial revenue forecasts has been conscious of the situation in which HAL is operating, including both 'step' changes in its operations and if and how we can expect trends to change during H7. We have attempted to put together a balanced set of forecasts, that avoids overly conservative or overly optimistic assumptions. Nevertheless, there are multiple areas of uncertainty in our forecasts – some of which may be addressed by more information being provided from HAL in subsequent stages of the price review, and others that are worth the CAA considering as part of the broader H7 regulatory package (e.g. alongside other measures such as risk sharing / uncertainty mechanisms).

1. CEPA has led the review of commercial revenues and Taylor Airey the review of opex

HAL's forecasting approach

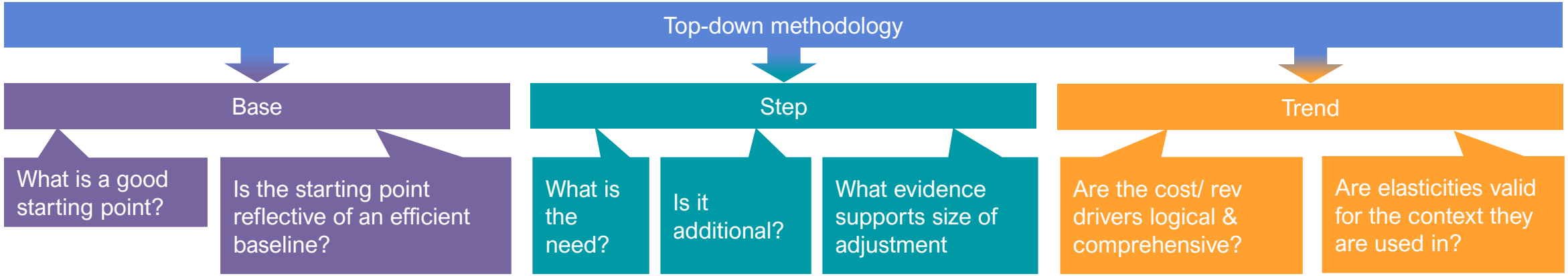
HAL has adopted a relatively standard Base-Step-Trend approach to producing its RBP forecasts:

- **Base:** HAL has chosen to use a 2019 base (with adjustments), as opposed to using a 2020 base as its starting point year. HAL also assumes its 2019 baseline opex and commercial revenues are both efficient – and has therefore made limited efficiency adjustments.
  - The approach of using a 2019 base is the most pragmatic option – there are issues with this (as discussed within this report), but in the time available and given the information we have access to, we consider the approach to be reasonable.
  - However, we have identified a number of issues with the evidence HAL has provided around the efficiency of the 2019 base. This evidence base has been reviewed and challenged as part of our analysis.
- **Step:** HAL has applied several top-down overlays, or 'step' changes' to both opex and commercial revenues, mostly relating to the COVID-19 pandemic.
  - In a few areas, the logic underpinning the inclusion of overlays is not provided and the evidence around the size (£m) of overlays requested is not always sufficiently substantiated. However, the updated RBP includes a lot more detail around the forecasts.
- **Trend:** HAL has taken a top-down approach of applying cost/revenue drivers and associated elasticities.
  - We consider the evidence around the elasticities is stronger than the evidence HAL provided for iH7 but believe there is more scope for scenario-based analysis given this presents a key area of uncertainty.

Our forecasting approach

HAL has applied several overlays to both its opex and commercial revenue forecasts, citing the impact of the pandemic, structural shifts to consumer needs and demands, etc. Although we understand the rationale behind this approach, each overlay takes away from the relatively simple forecasting approach originally adopted. A more robust, transparent approach would have been to do a full bottom-up assessment – where, for certain categories of cost or revenue that are affected by substantial step changes, the costs/revenues are built-up based on the new operating structure.

In the time available to produce this report, and with the data/information we have had access to, it has not been feasible for us to take a fully bottom-up approach. We have, therefore, mimicked HAL's forecasting approach, disaggregating where necessary and feasible. We have identified the key assumptions that drive HAL's forecasts, challenged the evidence base underpinning them, and where necessary, presented alternate assumptions that we consider are supported by a stronger logic or evidence base given current information. **We provide final opex and commercial revenue forecasts for each of the CAA's passenger forecast scenarios (High, Mid, Low)** but in our reporting typically use HAL's Mid case passenger forecasts to allow a like for like comparison between our forecasts and HAL's.



- 2019 is a pragmatic start year.
- We have reviewed previous CAA and HAL-commissioned evidence.
- We have validated the starting point of key sub-categories with bottom-up analysis.

- We tested the logic and evidence for the need and additionality of step changes.
- Where HAL's evidence for the size of their adjustment is inadequate, we produce alternate estimates using other evidence sources or using transparent assumptions.

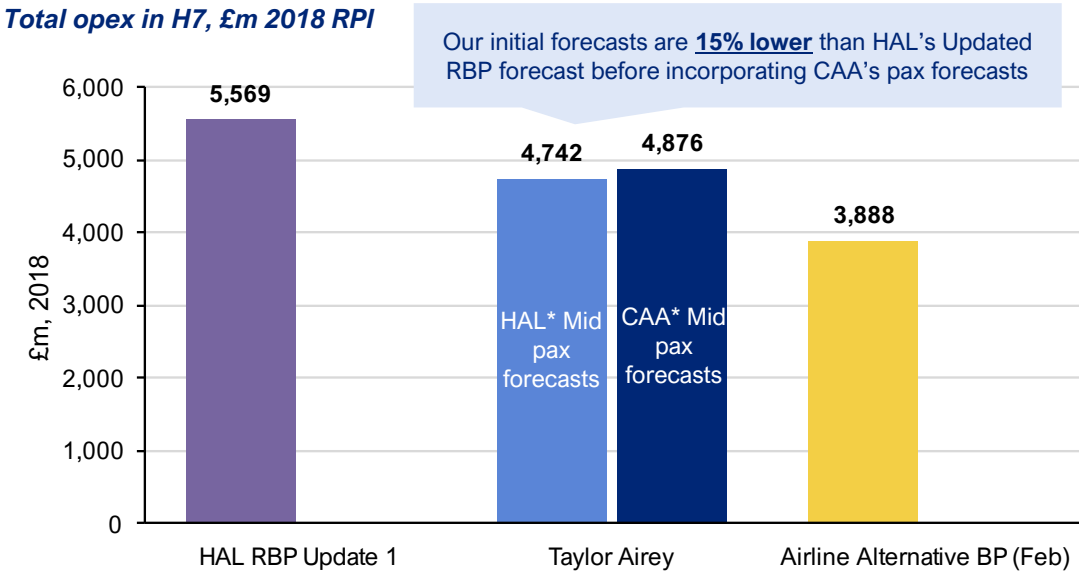
- We review any econometric analysis used to support the elasticity estimates.
- We derive 'bottom-up' elasticities where more appropriate.

Summary of our initial assessment

Our review of HAL's Updated RBP has led us to propose alternative forecasts for both opex and commercial revenues.

Opex

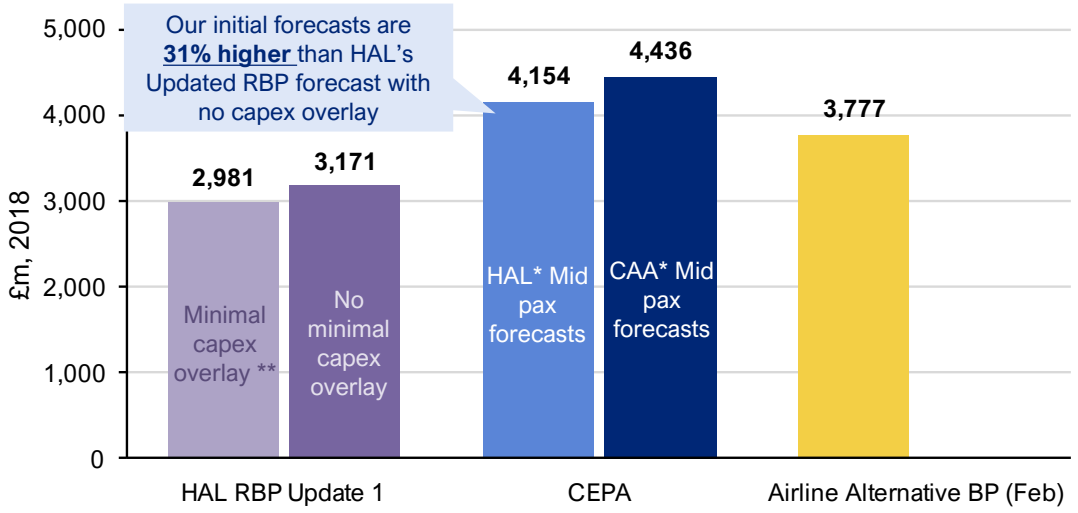
Total opex in H7, £m 2018 RPI



Source: Taylor Airey analysis

Commercial revenues and Cargo revenue

Total commercial and cargo revenues in H7, £m 2018 RPI



Source: CEPA analysis

In the pages below we provide a more detailed summary of our findings which inform these initial forecasts.

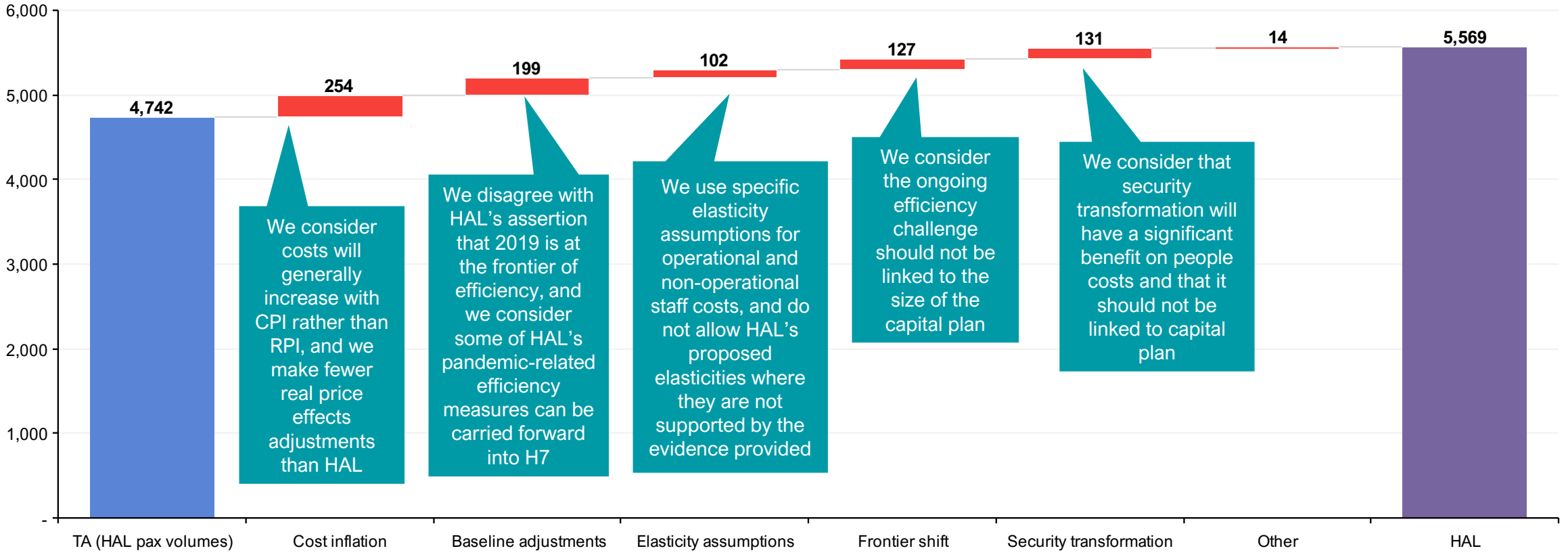
It is important to note that our adjustments to HAL's forecasts reflect the information as seen in the RBP and Updated RBP. **To the extent that HAL can provide additional supporting information and evidence to more robustly justify its assumptions as compared to our own, then we would expect to review our findings and conclusions.** We have set out in this report the key areas of the Updated RBP where the CAA should seek further information and analysis from HAL.

* Both HAL and the CAA have developed High, Mid, Low pax forecasts for the H7 period. We use the Mid pax forecast for figures presented.

** In HAL's no RAB adjustment scenario (which we use as the basis of comparison), HAL apply a negative overlay to their revenue forecasts. This negative overlay is to reflect the impact on revenues from not having their preferred levels of capital investment.

Comparison of HAL and TA opex forecasts: Key drivers of differences

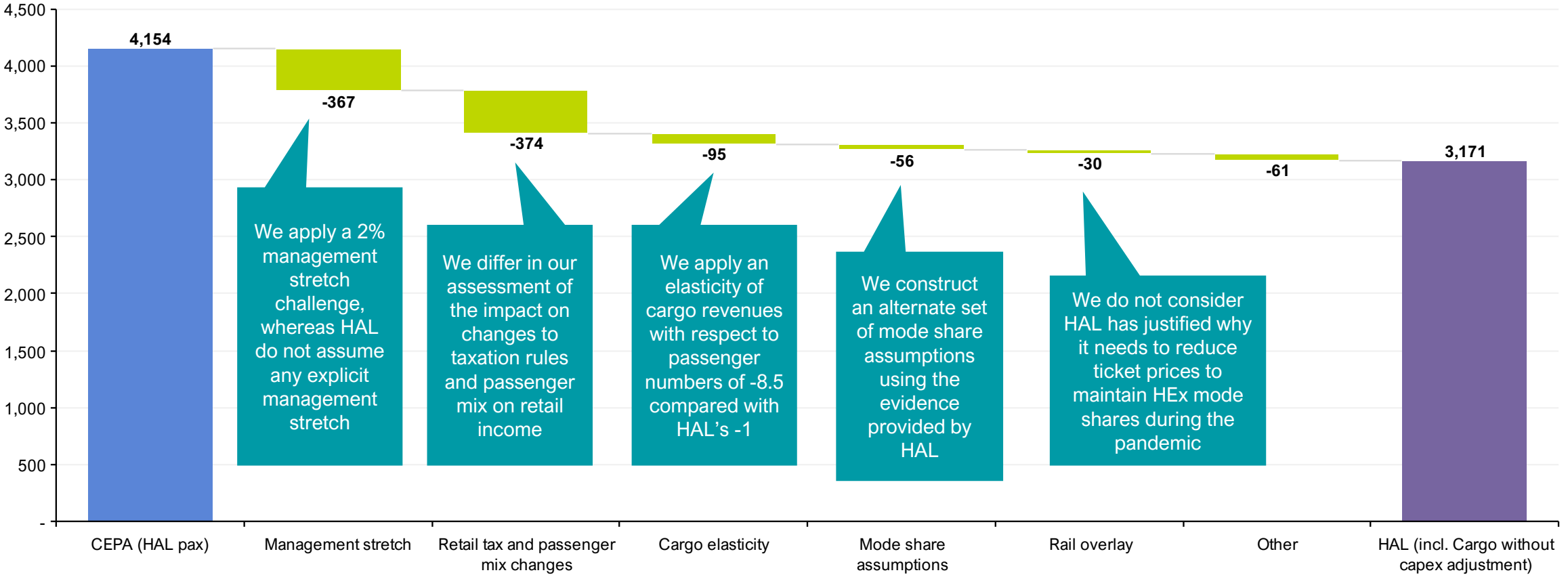
Waterfall chart of Taylor Airey initial forecasts vs. HAL Updated RBP, total for H7 (£m, 2018 RPI prices)



Source: Taylor Airey analysis

Comparison of HAL and CEPA revenue forecasts: Key drivers of differences

Waterfall chart of CEPA initial revenue forecasts vs. HAL Updated RBP, total for H7 (£m, 2018 RPI prices)



Source: CEPA analysis

Executive Summary

Opex forecasts

- Efficiency of 2019 and the need for baseline adjustments
- Stretch and opportunity – example Security Transformation
- Frontier shift and capital substitution
- Selected overlays
- Overall results

2019 and the need for baseline adjustments

We consider three issues when determining the need for adjustments to our 2019 baseline:

1. **The efficiency of 2019 as a baseline** – We consider whether the information presented by HAL demonstrates it was operating at the frontier of efficiency in 2019.
2. **HAL's adjustments to its 2019 baseline** – We review whether the adjustments HAL makes to its 2019 costs before using it as a baseline, are appropriate. In doing so, we consider both the reasons for adjustments and the size of the adjustment made. In particular, we look for evidence to show that staff costs associated with the Heathrow Expansion Programme have been fully removed and that these are not included in the base and projected forwards.
3. **Actions taken since 2019** – We review the extent to which HAL's cost control actions taken in 2020 and 2021 are sustainable and can be carried forward into the H7 period.

The tests above are used to inform our assessment of the need for an adjustment to our 2019 opex to make it a suitable baseline for our forecast. We summarise our findings in the table below:

Comparison of HAL and Taylor Airey views regarding the efficiency of 2019 as a base and the need for adjustments:

	HAL	Taylor Airey			
	£m (nominal)	£m (nominal)	Rationale	Category	Period
1 Efficiency of 2019 as a baseline	✂	-17	We have considered average productivity achieved in the last 3 years of the Q6/ Q+1 period to smooth variations in individual years, in particular, opex increases in 2019.	Pro-rated across categories	From 2020
2 HAL adjustments to 2019 baseline:	✂	✂	We have used HAL's proposed adjustment for the removal of expansion costs, pending further assessment. And we allow some of HAL's overlay for the London Living Wage, but we consider further evidence is required before allowing the full overlay.	Multiple	From 2020
3 Actions taken since 2019	✂	✂	At least 50% of the ✂ pa (2018 RPI prices) benefits of reorganisation identified by HAL would be expected to be sustainable.	People	From 2020

Source: Taylor Airey analysis

Security Transformation: Our view

We conclude that opex benefits can arise from improving security efficiency through people and process change, regardless of the level of capital investment in security. Benefits should be modelled directly in the People cost category rather than as capital substitution effects.

Comments on HAL's approach to modelling benefits:

1. **Maturity of HAL's analysis**

   As security staff costs represented between 40-45% of the staff cost base in Q6, benefits in this critical area would be expected to be modelled in detail at every stage of the business planning process.

   This modelling will be informed by the pilot projects that have recently commenced and will undoubtedly be refined as these project progress. However, as the processes and technologies are relatively well understood, it would be expected that HAL's modelling would already have produced reliable indicators of the impacts of the security transformation programme.

   In comparison with similar developments in train at other airports, it would also be expected that HAL would have commenced process improvement initiatives to ameliorate the well-known throughput penalties of operating the new systems with existing processes.

2. **Dependency on capex**

   Experience from other airports as well as from HAL's past initiatives shows that benefits can be derived from operational process improvements which are independent of infrastructure or equipment change, i.e. the way that staff are deployed and the tasks they do, as well as the way the passengers are directed through the process. As the screening technology changes are mandated by regulation, operational processes will change regardless of the capital allowance.

   We therefore disagree with HAL's view that no efficiency improvements are possible without higher capital expenditure.

Our alternate view:

Rather than the airlines' approach of deriving an absolute figure per annum, benefits from security transformation will be volume related and it would be more accurate to treat them as an amended elasticity with respect to passengers for security staff FTE rather than an overlay.

We have therefore undertaken detailed modelling to create a bottom-up validation of relevant elasticities to use for Security people costs.

In this way we have derived multiple elasticities to account for the step changes produced by the introduction of new technologies.

The assumptions, approach and outputs from this analysis are shown on the following pages.

Security: Estimating staff costs

We have created a queuing model to estimate the impacts of the security transformation on the requirements for security full time equivalents (FTE) staff and have applied this model to calculate the relationship (elasticity) between passenger volume and the number of FTEs required. We have overlaid this model with expected efficiencies in terms of passenger throughput and process improvement indicated by HAL and through comparison with stretch targets anticipated at other UK airports operating similar equipment and processes.

Assumptions and sources:

1. Security staff requirements comprise a variable part, associated with passenger and hand baggage screening, that depends on passenger volumes, and a fixed part, e.g. for fixed posts, that is inelastic to passenger volumes.
2. HAL's future security processes will take advantage of the capabilities of the new technologies – body scanners, computed tomography (CT) screening, etc – that are mandated in the same way that other airports operate or plan to operate.
3. HAL suggest that throughput will increase from ✂ passengers per hour per security lane to ✂ passengers per hour per lane: we assume that this change is phased from 2022 to 2026, that is an improvement of ✂ over five years or approximately ✂ per year.
4. Our experience of comparison with the aspirations of other UK and international airports suggests that process improvement initiatives can reduce the variable staff requirements for security lanes by ✂ typically over five years: we assume this starts in 2023 and that is an annual improvement of ✂ per year.
5. In parallel, technology improvements and process efficiency will reduce the requirement for fixed staffing levels by 1% per year starting in 2023.
6. Historic staff numbers to 2018 are sourced from the Steer report on opex efficiency with 2019 figures being sourced from the PA-Nyras report commissioned by the LACC.
7. The fixed component of the staff cohort is estimated from staff classified as "campus" and "other" in the Steer report with the variable component of the staff cohort derived from the remaining staff, assigned to terminals in the Steer report.
8. Historical costs are derived from HAL's regulatory accounts.
9. Projected costs are estimated using the 2019 cost per security FTE of ✂ derived from the regulatory accounts and the PA-Nyras report, meaning that wage inflation and counteracting measures to reduce costs are not included (or cancel each other out).

Sources:

PA Consulting (Nyras) (2020) Operating Cost Report and Presentation Benchmarking Study

Steer, December 2019: Operating Cost

2021.03.02 - Airline Community Presentation to CAA_RBP Feedback and ABP_Final

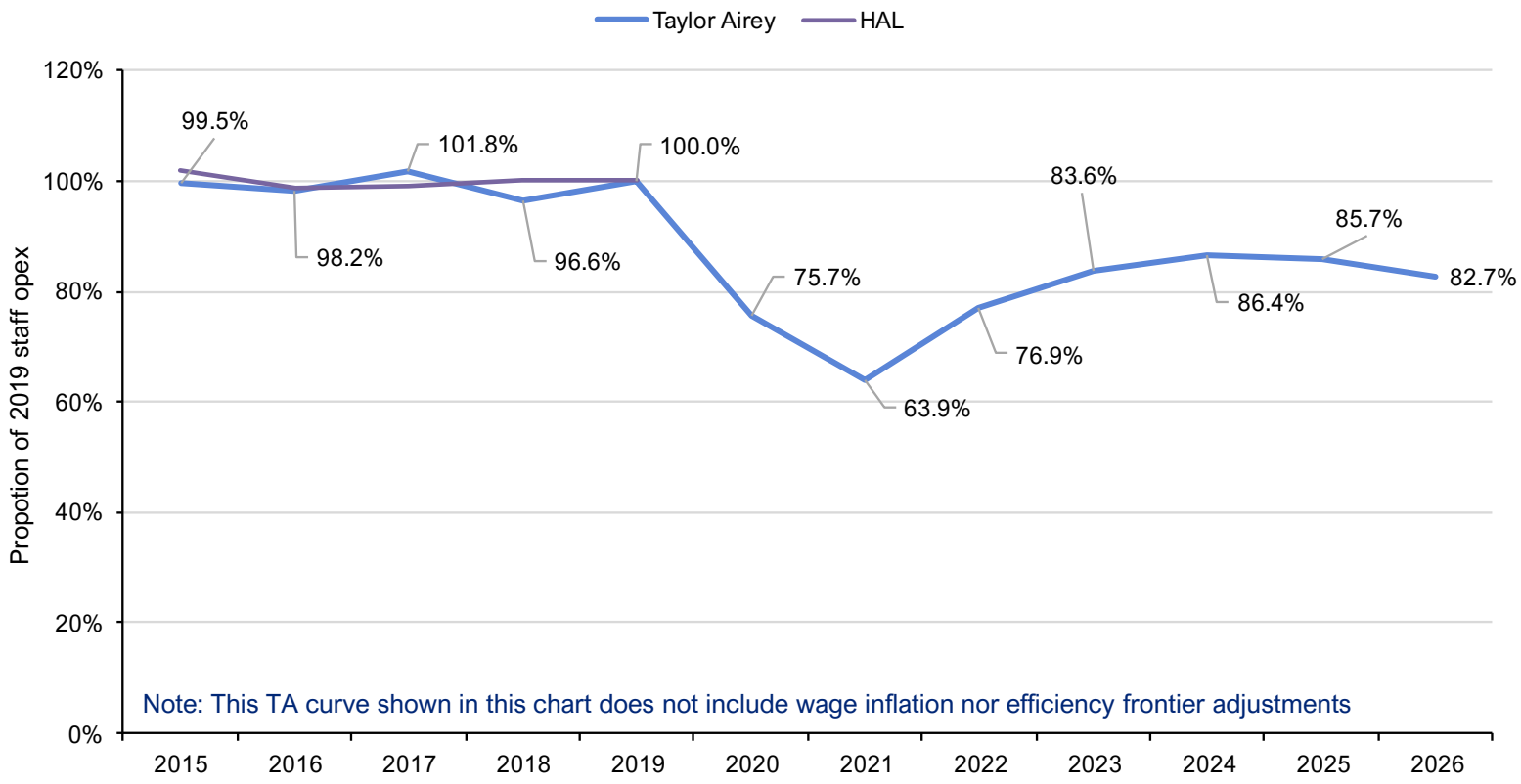
Note:

Detail on the approach used to estimate security staff costs is provided in section 3, "opex forecasts" part C "people"

Estimating staff costs: Results

The figure below compares our estimates of staff costs, historical through to projections in nominal terms referenced to the 2019 baseline. For comparison, HAL's projections from the RBP model (Update 1) are also shown normalised to 2019.

Projection of staff costs as a proportion of 2019 costs, nominal



Source: Taylor Airey analysis

Impact of Terminal closures - People

Table 4: Updated terminal opening dates for different passenger volume scenarios in Update 1

Updated Terminal Opening Dates	T4 Open For Red List Arrivals	T4 Open to all Arrivals
High (P90)	June 2021	June 2023
Mid (P50)	June 2021	June 2023
Low (P10)	June 2021	June 2025

Source: Heathrow

HAL has operated its infrastructure in various configurations since the start of the pandemic:

- Initially reducing to a two terminal, single runway operation to better align with demand.
- Then reopening Terminal 4 as a terminal for arrivals from 'red-list' countries – costs expected to be recovered.
- Limited breakdown of the Red List operation is provided (HAL assumes that ✂ of security staff and ✂ of Engineering staff cost are required for Red list operation).

In addition to T2 and T5, HAL's base assumptions for terminal usage in H7 are:

- Terminal 3 is fully operational throughout H7
- Terminal 4 opens as shown in the RBP table left

To assess the impact of operating with these consolidated facilities, HAL adjusts for area utilised using the metrics below, derived from 2018 average historical costs.

Cost category	Multiplier (2018 RPI prices)
Change in People costs	✂
Change in Operational costs	✂
Change in Utilities costs	✂

Sources:

Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7.1: Operating Costs

Heathrow Airport, RBP Update 1, June 2021 7. Additional evidence to support our Scenarios

Impact of Terminal closures: People

Efficiency:

HAL commissioned Frontier Economics to undertake analysis of the elasticity of operating costs to various cost drivers at the airport.[1]

As Frontier Economics could find no relationship between HAL's historical people costs and their drivers, we question whether these multipliers could be considered appropriate or efficient. **Our forecasting approach broadly follows Heathrow's, but we will consider further ways to validate their assumptions at a later stage.**

Also, the inclusion of T4 use as a Red list terminal makes it unclear in HAL's model whether the costs returned post-opening match the savings made whilst the terminal was closed.

- e.g. ✂

Reopening of T4 for all arrivals:

We agree with HAL's approach of ramping up costs in the 3 months preceding full reopening of T4 as staff are retrained and re-familiarised.

However, the proposed trajectory (✂) and the approach of applying a space driver to people costs is likely to be overly cautious as it means that 100% of T4 people cost returns on the day that T4 is reopened, regardless of the passenger volume served.

Proportion of T4 staff savings possible due to terminal closure - 2023

Source: Taylor Airey analysis

If we accept HAL's proposed multiplier of ✂, our more conservative assumptions would equate to a further potential saving of £5m (2018 RPI prices) in 2023 over that modelled by HAL in their forecasts.

Commentary on the impact of terminal closures on Operational Costs and Utilities costs are included in our later discussions of those costs categories.

Note 1: Frontier Economics (2019) Developing opex and commercial revenue elasticities for H7

Frontier shift and capital benefits

TAYLOR | AIREY

HAL approach

HAL combines these factors as follows:

- 0.1% benefit pa based on productivity improvements as an appropriate level for a Frontier Shift, based on analysis prepared by First Economics (applied to all cost categories except Rates and Distribution Contract).
- 1.1% savings based on opex benefits arising from the opex benefits of capital investment.

In HAL's proposal, the 1.1% capex benefit is contingent on approval of the £4.2bn capital plan as HAL claims that the projects that deliver opex efficiency are not included in lower cost capex plans.

Our view

We agree that there are likely to be two broad factors delivering the opportunity for improved efficiency in H7:

- A total factor productivity (TFP) type benefit
- Improvements in labour productivity potential above TFP growth – such as opex benefits arising from capital investment

However, we disagree with the approach taken by HAL to calculating potential 'capital substitution' effect and do not feel that it is supported by the study commissioned from First Economics or the precedents it quotes. We would expect capital investment to have a lagging effect when it comes to delivering benefits, and not be solely linked to projects in train as part of the H7 capital plan.

We therefore feel that the calculation of 1.1% provided by HAL in the RBP and the conditionality on particular projects being allowed in the agreed H7 capital plan is not supported by precedent or the evidence provided.

While recognising that more recent price determinations (e.g. RIIO-2, PR19) have considered frontier shift estimates of >1%, **we apply an overall frontier shift estimate of 1%** reflecting ongoing productivity gains supported by precedent developed over several price controls and reflecting that large, one-off efficiency savings are captured as overlays. **We propose not linking the frontier shift estimate with the size of the capital plan**.

Following HAL's approach, we apply our frontier shift estimate to all cost categories except for rates, the electricity distribution contract, and the new cost overlays introduced for H7 (e.g. opex related to the terminal drop-off charge, Covid-19 overlay etc).

	Opex	Capex
Ofgem, RIIO-GD1/T1, 2012	1.0%	0.7%
CAA, Heathrow Airport, 2014	1.0%	-
Competition Commission, Northern Ireland Electricity, 2014	1.0%	1.0%
Ofgem, RIIO-ED1, 2014 [A]	1.0%	0.7% to 1.0%
Utility Regulator, NI Water, 2014	0.9%	0.6%
CMA, Bristol Water, 2015	1.0%	-
Utility Regulator, GD17, 2016	1.0%	1.0%
Ofwat, PR19, 2019 (draft determination range)	~1% *	

Source: First Economics August 2019 - Frontier Shift, Input Price Inflation and Productivity Growth A report prepared for Heathrow Airport

Opex benefits from capital investment: Our view

We conclude that HAL should consider whether opex benefits, for example in Facilities and Maintenance costs, arise from other parts of the capex portfolio, even in the Safety Only capital plan.

The 'Safety Only' capital plan delivers a portfolio of projects under the banner Protect the Business with two objectives:

- Asset management and compliance (£2.138bn)
- Protect efficiency and revenue (£0.36bn)

Our view is that there are likely to be operating cost benefits arising from programmes in this plan – we disagree with HAL's view that opex benefits are only possible with the Optimal Plan.

Having considered the additional detail provided on the rationale and prioritisation of these programmes provided by the RBP Update, we suggest that benefits are likely to be delivered by the following programmes in the Safety Only plan:

- Asset replacement (£1.5bn)
- T2 Baggage (£0.18bn)
- Regulated Compliance (£0.42bn)
- Avoid material Opex increases (£0.1bn)

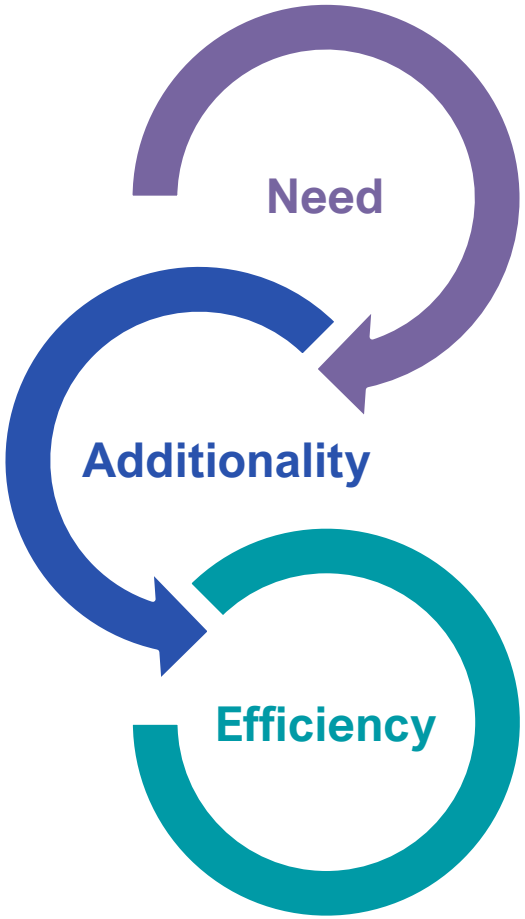
We understand that the primary objective of this part of the capital portfolio is to deliver on mandatory requirements rather than enhance the asset base. In principle however, the replacement of end-of-life assets with newer, modern equipment with greater reliability would be expected to reduce the amount of time and resource required for planned and corrective maintenance with a positive benefit on the Facilities and Maintenance opex category.

Around 60% of the investment proposed in this plan is under the heading of Asset Replacement (£1.5bn). In this section of the RBP Update[1], HAL considers that a further £400m could have been added to the Asset Replacement budget. However, as a mitigation for not including this, it refers to the potential need for, *"…a 10% uplift in maintenance opex to allow for increased maintenance regimes across the airport (which) could extend the life of assets and help to mitigate against assets being out of service…"*

As HAL considers the downside risk of higher opex due to lower capital spend on asset replacement, it seems inconsistent that it does not consider the upside opportunity for opex reduction arising from a considerable investment in new and more resilient assets.

1. Heathrow Airport Limited (2021) Revised Business Plan Update – 5.3 H7 Capital plan updates

Enhanced service cost overlay: Summary



For the "Full RAB Adjustment case", HAL asserts that an additional ✂ (2018 RPI prices) per annum is required as an enhanced service cost overlay (ESO) to deliver a "*I feel cared for and supported*" consumer outcome. This ✂ comprises:

1. £✂ for the 39% of passengers requiring support who choose not to use "*our dedicated assistance service*";
2. an additional ✂ maintenance to ensure resilience of passenger sensitive equipment (PSE) that has suffered under investment and cannot be replaced under the current capital programme;
3. £✂ for digital services bridging a customer services gap; and
4. £✂ to support the roll-out of new automated, touchless parts of the passenger journey.

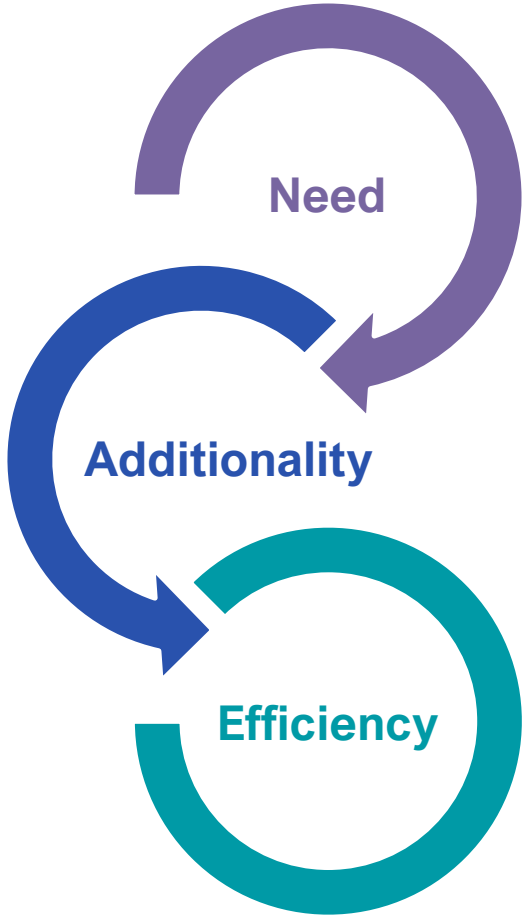
With the exception of (2) on resilience, none of the above elements of the enhanced service overlay would appear to be additional to business as usual activities. Of the ✂ allocated to resilience, part of this may be justified for old, difficult to maintain, equipment, but there is a risk of overlap with standard maintenance and a potential inflation as equipment in, for example, Terminal 2, is not likely to be at end of life or difficult to maintain.

As the enhanced service overlay appears to cover or overlap with business as usual activities accounted for elsewhere, specifically standard maintenance and support to passengers with reduced mobility (PRM), we propose to apply a reduced enhanced service cost overlay of **£7m in 2022 adjusted for efficiencies going forward**.

Covid overlay

Table 6: Covid-19 Cost Overlay (£m, 2018p)

(£m, 2018p)	2022	2023	2024	2025	2026	H7 Total



There have clearly been costs incurred in the immediate pandemic response in 2020/21 which are unprecedented and could not be expected to be included in historical short run elasticities. However there is not a convincing case presented to evidence why such effects are expected to continue throughout the H7 period at a constant level (✂, 2018 RPI prices) without any mitigation.

Due to a lack of transparency of the data it is difficult to determine whether the cost of public health responses may duplicate items that would have already been accounted for in facilities, cleaning and maintenance.

Given the unique characteristics of HAL's business and its operational responses it is difficult to benchmark what an efficient cost might look like. However 2020 actual costs would be expected to be an unrealistically high estimate for the H7 years as:

- The immediacy of the responses required may not have allowed time for best value solutions to be sourced
- The supplier base for certain items may have been limited and competing demand in the market high (for example for hand sanitiser, wipes, PPE etc) in the early stages of the pandemic response
- No mitigations had yet been developed
- Costs incurred in 2020 arose in response to guidelines in force at that time. These are unlikely to be the same in the later years of the H7 period

Therefore, we propose using an overlay which tapers from ✂ (2018 RPI prices) in 2022 to 0 by 2026

Summary of opex forecasts

HAL forecasts: *HAL mid pax forecasts, No RAB Adjustment*

2018 RPI prices, £m	2022	2023	2024	2025	2026
People	✂	✂	✂	✂	✂
Operational excl. insurance	✂	✂	✂	✂	✂
Insurance	✂	✂	✂	✂	✂
Facilities and maintenance	✂	✂	✂	✂	✂
Rates	✂	✂	✂	✂	✂
Utilities exc. distribution	✂	✂	✂	✂	✂
Distribution contract	✂	✂	✂	✂	✂
General expenses	✂	✂	✂	✂	✂
Surface access initiatives	✂	✂	✂	✂	✂
Other overlays	✂	✂	✂	✂	✂
Total	**1,012**	**1,093**	**1,137**	**1,159**	**1,168**
Total per passenger, £	24.36	19.44	17.32	16.46	16.21

Source: HAL Analysis

Note – HAL and Taylor Airey opex forecasts are reported on a consistent HAL Mid pax forecast scenario.

Taylor Airey forecasts: *HAL mid pax forecasts, No RAB Adjustment*

2018 RPI prices, £m	2022	2023	2024	2025	2026
People	224	238	245	240	233
Operational excl. insurance	204	227	238	240	237
Insurance	✂	✂	✂	✂	✂
Facilities and maintenance	134	145	151	152	152
Rates	113	112	111	110	109
Utilities exc. distribution	50	56	59	60	61
Distribution contract	✂	✂	✂	✂	✂
General expenses	95	102	106	106	105
Surface access initiatives	8	9	9	11	10
Other overlays	17	15	12	10	7
Total	**891**	**949**	**974**	**971**	**957**
Total per passenger, £	21.44	16.89	14.84	13.80	13.28

Difference with HAL, £m	**-121**	**-144**	**-163**	**-188**	**-211**
Cumulative difference, £m					**-827**

Source: Taylor Airey Analysis

Scenario comparison: Total and per passenger

Taylor Airey opex forecasts based on CAA passenger forecast scenarios: low, medium (base case) and high

Taylor Airey's opex forecasts under different CAA passenger forecast scenarios: *total opex*

2018 RPI prices, £m	2022	2023	2024	2025	2026	H7
High	946	1,005	1,033	1,033	1,019	**5,036**
Mid	909	966	1,000	1,006	995	**4,876**
Low	791	849	904	932	952	**4,429**

Source: Taylor Airey analysis

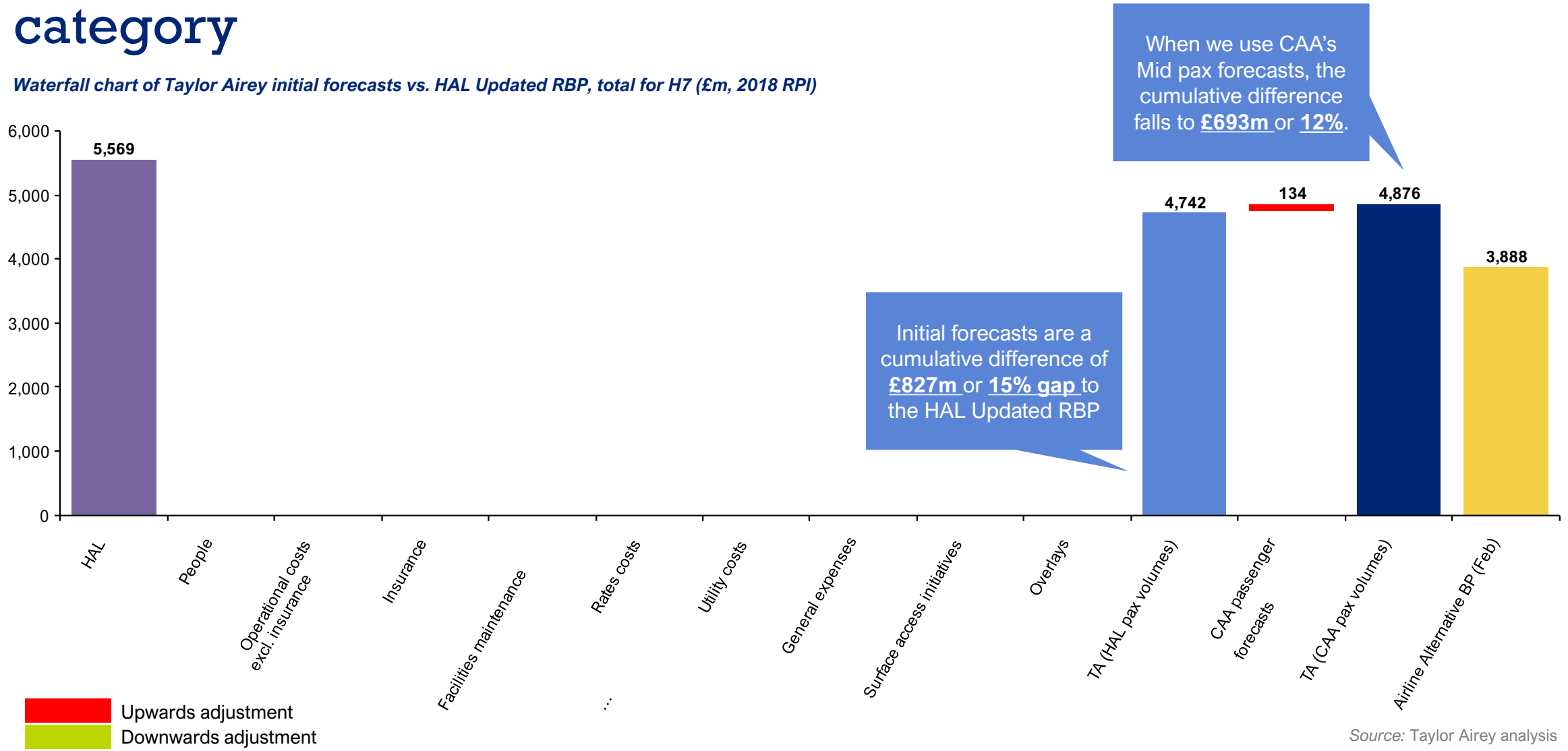
Taylor Airey's opex forecasts under different CAA passenger forecast scenarios: *per passenger opex*

2018 RPI prices, £	2022	2023	2024	2025	2026
High	17.5	14.5	12.9	12.0	11.5
Mid	19.9	16.0	13.9	12.7	12.1
Low	42.2	23.4	16.4	14.7	13.4

Source: Taylor Airey analysis

Comparison of HAL and TA opex forecasts by category

Waterfall chart of Taylor Airey initial forecasts vs. HAL Updated RBP, total for H7 (£m, 2018 RPI)

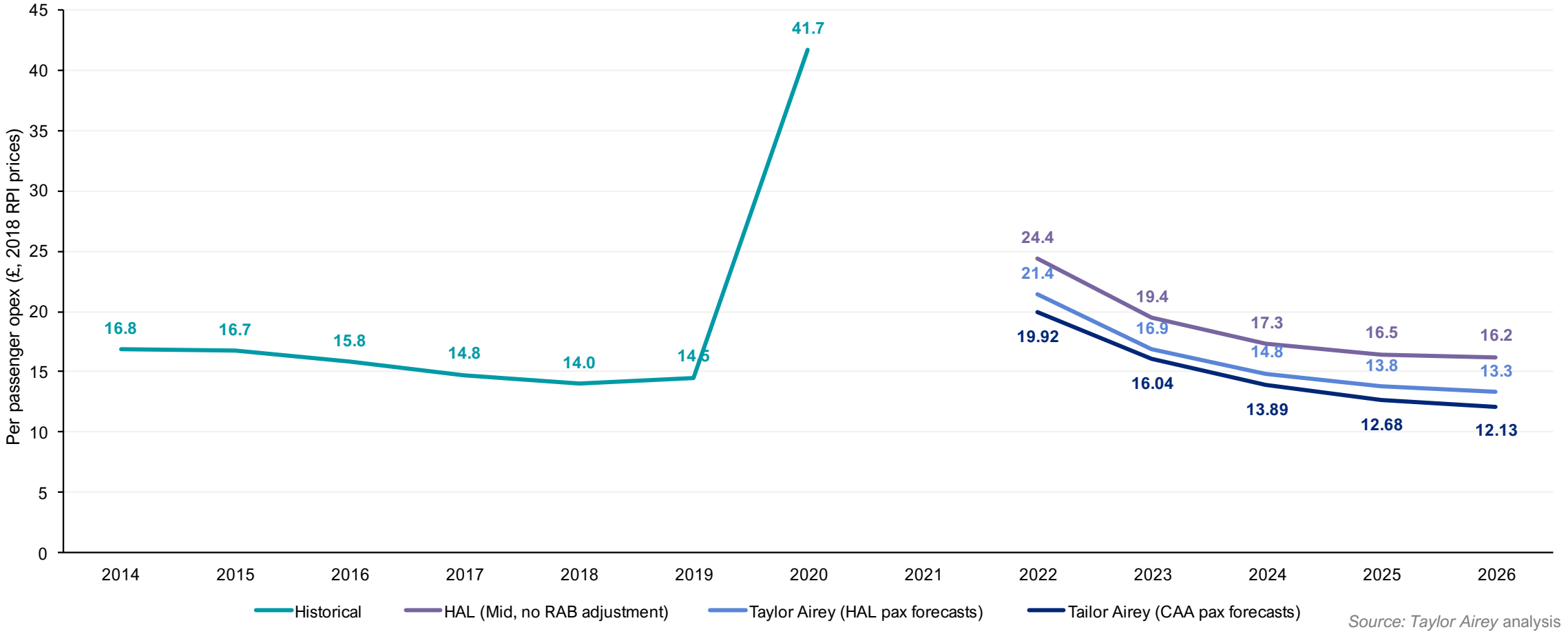


Source: Taylor Airey analysis

Note: HAL and Taylor Airey opex forecasts are reported on a consistent HAL Mid pax forecast scenario except for the final waterfall step which uses the CAA Mid pax forecast scenario.

Comparison of HAL and TA opex forecasts

Comparison of per passenger opex forecasts



Source: Taylor Airey analysis

Note: Both HAL and the CAA have developed High, Mid, Low pax forecasts for the H7 period. We use the Mid pax forecast for figures presented above.

Executive Summary

Commercial revenue forecasts

- Efficiency of 2019 figures as a baseline
- Elasticities
- Retail
- Surface access
- Other elements of commercial revenues
- Overall results

HAL's efficiency in 2019

We accept the starting assumption that HAL's performance in 2015 was at the efficiency frontier, based on SDG's previous analysis for the CAA. Beyond 2015, we see that HAL's ability to grow revenue has stagnated but probably not enough for it to now be materially inefficient.

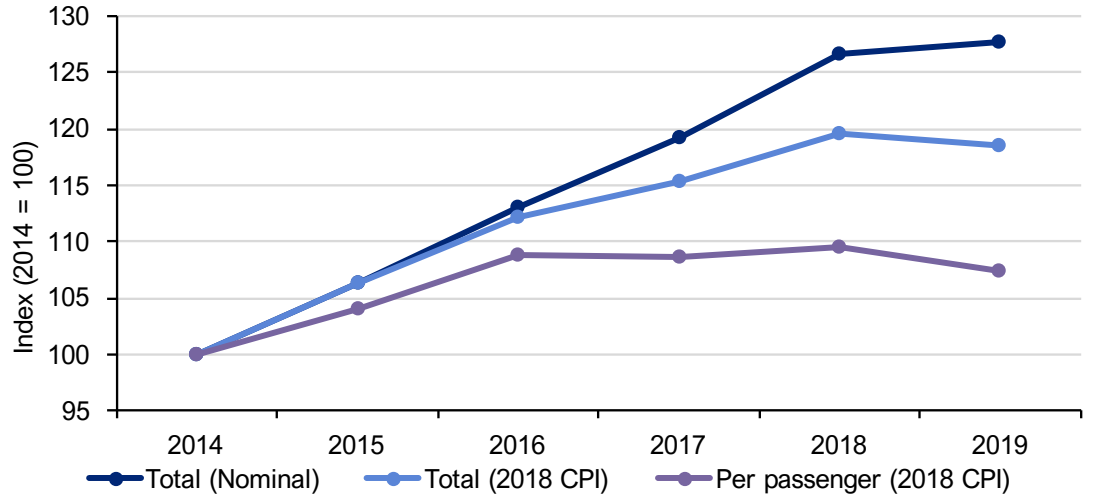
As shown in the chart on the right, **HAL's per passenger revenues in 2019 were broadly similar to what they were in 2015**. The key question is whether this stagnation in performance now means HAL is no longer at the efficiency frontier for commercial revenue generation.

We have some concerns with the KPMG[1] analysis commissioned by HAL on its 2019 baseline efficiency:

- Our key concern, as aired previously in our work for the LACC, is that the econometric benchmarking does not show (as is claimed by KPMG and HAL) that HAL operated at the efficiency frontier by 2019. Instead it shows HAL's **change in relative performance** over the period assessed. In other words, it shows whether, over the period assessed, HAL has improved by more than its peers or by less than its peers.
- We also share Taylor Airey's concern (in analysis undertaken for LACC) about the lack of transparency around the methodology. BUT, the KPMG analysis does find that HAL's relative performance improved over the period 2015-2018 for retail and car parking, with property being the one exception.

This suggests that HAL's overall commercial revenues are likely to have been efficient in 2018, though there may have been scope for more revenue generation in 2019 particularly in property. **At this stage we have not proposed any efficiency adjustments.**

HAL commercial revenues over Q6 (2014-2019)



Source: CEPA analysis of HAL regulatory accounts, statutory accounts and RBP model

HAL commercial revenues over Q6 (2014-2019)

Commercial revenues	2014	2015	2016	2017	2018	2019
Total (£m, nominal)	778.9	828.3	880.4	929.3	986.3	994.7
Total (£m, 2018 CPI)	824.8	877.2	925.8	951.8	986.3	977.1
Per passenger (nominal)	10.6	11.0	11.6	11.9	12.3	12.3
Per passenger (£, 2018 CPI)	11.2	11.7	12.2	12.2	12.3	12.1

Source: CEPA analysis of HAL regulatory accounts, statutory accounts and RBP model

1. KPMG (2019) Airport Commercial Revenue Efficiency Benchmarking Report for Heathrow Airport Limited

Elasticities to estimate volume effects

We have made a number of adjustments to HAL's Updated RBP assumptions for elasticities to estimate volume effects

Management challenge

HAL claims its elasticity estimates are inclusive of a management challenge and, therefore, no separate adjustment is required. We disagree with this as volume effects and the management challenge are two different concepts – we do not consider it logical to assume that volume effects and management challenge always work in the same direction. **We propose a separate management challenge adjustment of 2% per annum**, based on HAL's historical performance in terms of increasing revenues above passenger growth.

Retail elasticity

HAL has proposed an elasticity of ✂ for forecasting retail volumes with respect to passenger numbers, drawing on econometric analysis undertaken by Frontier Economics. We conclude that there is a small risk of upward bias to this elasticity estimate given the management challenge has not been captured as a separate variable but have chosen not to make an adjustment for this in our forecasts for this report and **so use ✂ in our modelling.**

Other service revenue

HAL has proposed an elasticity of ✂ with respect to passenger numbers. We identify a number of reasons why this may be an overestimate (e.g. fuel sales are unlikely to be affected ✂ by passenger volumes) and **so, we have used an elasticity of 0.8 for the purposes of our forecasts.**

Car parking / rental revenue

HAL has proposed an elasticity of ✂ with respect to car parking/rental passengers. In the absence of robust econometric evidence to justify an alternative assumption, **we are content with this proposal** – the implicit assumption being the marginal passenger yields as much revenue as the average passenger. We separately consider the impact of COVID-19 on average yields.

Property elasticity

HAL has proposed an elasticity of ✂ for property revenue with respect to utilised terminal space. This is not supported by any evidence in the RBP. We use an alternate **elasticity estimate of 0.25**, based on data on the number of contracts HAL has with different types of property customers. We make assumptions on the types of contracts that are likely to be driven by terminal usage and derive our estimate accordingly.

Heathrow Express revenue

HAL has proposed an elasticity of ✂ with respect to HEx passengers. As the impact on yields as a result of COVID-19 and the introduction of Crossrail services is dealt with separately, **we have accepted HAL's elasticity proposal of ✂ for our initial forecasts**.

Summary of HAL's narrative supporting their retail forecasts

HAL has presented retail as being an area subject to a series of headwinds – an unfavourable passenger mix due to pandemic-related restrictions, a general move towards online shopping, the removal of airside tax-free shopping, the removal of the VAT retail-export scheme, and the continued decline of the currency exchange business. Of these, three specific overlays have been applied to the forecasts.

Retail tax changes

HAL assumes the impact of the various tax changes will reduce retail revenues by ✂ in 2022 relative to 2019, falling to ✂ in 2026 (previously a uniform ✂ reduction in the December 2020 RBP). The tax changes can be broadly split into three categories:

- The loss of **airside tax free pricing,** which will lead to:
  - A reduction in retail concession income from store closures (mostly luxury and fashion, technology and duty-free);
  - Less retail concession income from retailers who choose to absorb the additional VAT in return for lower concession rates;
  - Lost sales due to the passenger response to price increases, leading to a loss in concession income.
- The removal of the **VAT RES scheme,** which will lead to:
  - Lost concession income from Travelex who process VAT Refunds; and
  - An indirect loss in revenue from retail sales that are made by passengers using the cash they receive from VAT refunds.
- The **extension of excise duty relief** on alcohol and tobacco to EU passengers, which will lead to higher duty free income.

Retail impacts from COVID-19

HAL assumes that changes in the passenger mix will lead to a ✂ decline in revenue (relative to 2019) in 2022 and a ✂ decline in 2023, before returning to normal.

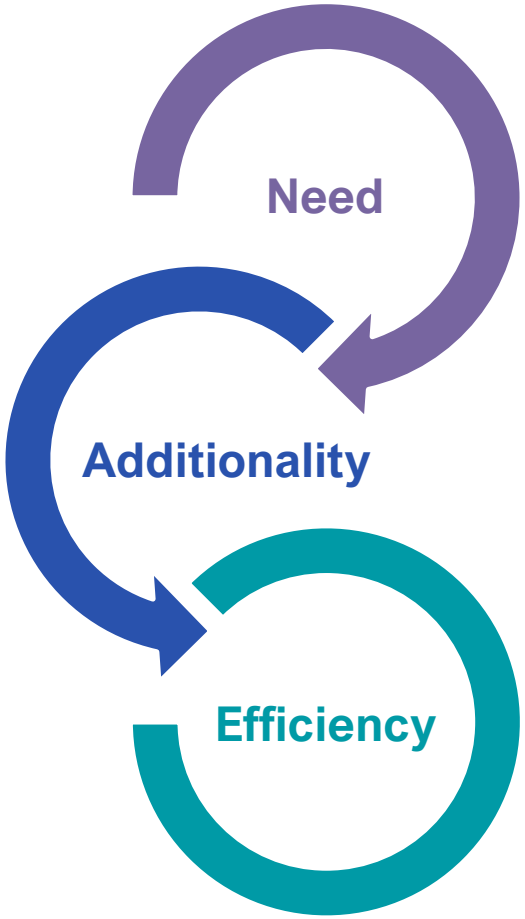
This is based on their forecast of the passenger mix, with fewer higher-spending Asia/Pacific passengers, and more lower spending domestic and European passengers.

Bureaux

HAL assumes a ✂ decline in bureaux income relative to 2019.

This is based on a decline in currency exchange transactions affecting the renegotiation of the Travelex contract.

Our view on HAL's proposed retail overlays for the tax and passenger mix changes



We understand the logic of changes in passenger mix affecting retail revenues received by HAL. And we accept that such changes in the passenger mix are likely to be material during H7 given the impact of the pandemic.

In terms of the tax changes, the impact of removing airside tax free on revenues, even when accounting for the duty free extension on alcohol and tobacco sales, remains material and needs to be considered as a separate overlay. Similarly, the removal of the VAT RES scheme will lead to a loss in income from the Travelex VAT refund concession, which also needs to be covered as an overlay.

However, the indirect loss of sales due to the removal of the VAT RES scheme does not meet the needs test. No convincing evidence has been provided by HAL to support the assumption that the refunds received by passengers are then spent at the departure lounge. As a result, we have not made an adjustment to account for this component of the overlay.

We consider the impact of changes in the passenger mix are unlikely to be accounted for through the passenger volume elasticity. Similarly, the tax changes are genuine step changes that are not accounted for elsewhere.

We can not conclude that the size of the overlays proposed by HAL reflect efficient adjustments to HAL's retail revenue forecasts. Key assumptions that drive the size of the adjustment have not been explained or supported by any evidence. As such, we propose alternative approaches that are described further overleaf.

Our proposed retail overlay for the tax and passenger mix changes

Changes in passenger mix

HAL assumes changes in the passenger mix will lead to a further reduction in retail revenue in 2022 and 2023, due to there being more (lower-spending) UK and EEA passengers and fewer (higher-spending) Asia/Pacific passengers.

Rather than applying an overlay, we have chosen to separately forecast retail revenue by market. To do this, we have broken retail revenue to a more granular level than is available within HAL's forecasts, triangulating accounts data from different HAL sources.

Our modelling approach leads to slightly different results than HAL's overlay. The table below shows HAL's proposed overlay compared with CEPA's estimate of the impact of changes in the passenger mix, both using HAL's passenger mix assumptions and using CAA's passenger mix assumptions:

HAL's proposed overlay to account for changes in the passenger mix, compared with CEPA's proposals

	2022	2023	2024	2025	2026
HAL RBP Update 1	✂	✂	✂	✂	✂
CEPA (HAL pax forecasts)	-6.4%	-1.6%	0.8%	1.8%	2.8%
CEPA (CAA pax forecasts)	-7.8%	-3.4%	-1.0%	-0.9%	-0.9%

Source: CEPA analysis, HAL analysis

Retail tax changes

We consider HAL's approach to estimating the impact of tax changes creates a substantial risk of double-counting. And many aspects of the estimates do not have supporting evidence.

As a result, we use an alternate elasticity-based approach to estimate the impact of: (1) removing airside tax free and (2) extending excise duty free for alcohol and tobacco to EU/EEA passengers. We begin by estimating the impact of the tax changes on price (e.g. removing airside tax free will increase prices by the rate of VAT, 20%). We then use an elasticity of -1.25 to estimate the effect on demand/ revenues. We also separately estimate the loss in VAT refund concession income, using HAL's most recent estimate of ✂ million.

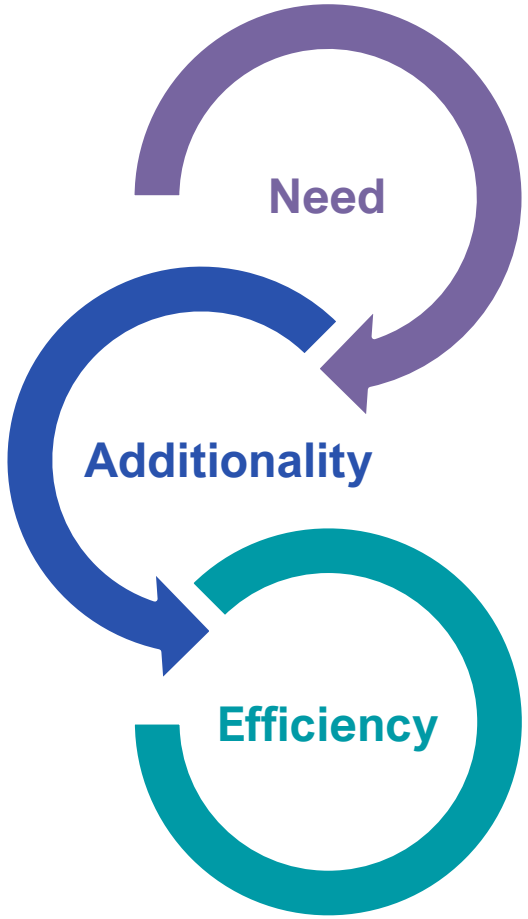
Our approach results in a weighted average impact on retail concession revenues of -13% assuming the 2019 passenger mix, substantially lower than the ✂ reduction assumed by HAL. When accounting for changes in the passenger mix, our weighted average overlay is as per the table below.

Comparison HAL's overlay with implied CEPA overlay to all retail revenues (excl. Bureaux) after accounting for changes to passenger mix.

	2022	2023	2024	2025	2026
HAL RBP Update 1	✂	✂	✂	✂	✂
CEPA	-15.8%	-16.8%	-17.5%	-17.9%	-18.3%

Source: CEPA analysis, HAL analysis

Our view of HAL's proposed overlay to Bureaux revenue



HAL has suggested that Bureaux revenue will reduce by ✂ relative to 2019 during H7. The RBP offers little explanation for the make up of this ✂, but based on discussions with airlines and our review of additional material presented to the CAA, we have developed a clearer understanding of the issues faced by HAL.

The material presented to the CAA provides some justification for an overlay. Travelex experienced a ✂ decline in walk-up currency exchange transactions at Heathrow from 2015-2019.[1] The previous concession contract operated largely on a fixed payment basis, which has so far protected HAL from these broader market trends. We understand that this contract expired in 2020, and we also note that Travelex entered into administration in 2020. HAL argues that the renegotiated contract has far less generous terms and does not offer fixed payment protections. **Consequently, we find that the needs test for an overlay has been met.**

There has been a long-term decline in walk-up FX transactions and currency exchange more generally, with passengers favouring electronic payments and currency cards. Based on industry insights, we expect this trend to continue – with the airport currency exchange market under pressure from both the move away from cash, and savvier travellers making more effective use of online price comparisons.

As no explanation has been provided for the size of the ✂ overlay, we have developed an alternate set of assumptions to test its efficiency. We assume the ✂ decline in walk-up transactions represents the longer term decline in currency exchange revenues, implying a 10% annual reduction. We then assume there is a step change in 2021 revenues to account for the cumulative reduction in income from 2014-2020 (when fixed payment protections expired), and that revenues from 2022 onwards decline with the same long-term trend.

This implies a reduction of 56% in 2022 rising to a 71% reduction in 2026, suggesting that HAL's estimate may be overstated.

% reduction from 2019 levels	2022	2023	2024	2025	2026
Currency exchange	-56%	-60%	-64%	-67%	-71%

Source: CEPA analysis

1. CAA session on commercial revenues in the RBP (4 December 2020)

Summary of HAL's narrative around the surface access forecasts

In their RBP and subsequent presentations, HAL has presented a series of headwinds and opportunities related to surface access. These broadly sit in three categories – the impact of the COVID-19 pandemic, the introduction of Crossrail services, and management initiatives to increase revenues.

The pandemic is expected to lead to some short-term structural shifts in how passengers travel to/from the airport and the types of passengers that use different surface access services.

- Change in passenger mix, with more leisure and short-haul passengers and fewer business and long-haul passengers:
  - This is assumed to lead to lower average transaction values (ATV) for HAL's car rental and car parking services
  - Less revenue from Heathrow Express
- Fewer passengers:
  - Less revenue from all surface access services
- A shift from public transport to private transport modes:
  - Less Heathrow Express revenue
  - More transactions from car rental and car parking

The introduction of **Crossrail services** is expected to lead to a step change in how passengers travel to the airport, with a shift from other transport modes to Crossrail.

- Transfer of passengers from Heathrow Express to Crossrail
  - Less rail revenue

HAL is considering several **management initiatives** that may lead to a step increase in surface access revenues.

- Using closed car parks for alternate purposes until demand returns:
  - Mitigating impact of lower volumes
- Terminal drop-off charge:
  - New revenue stream

Our view of the surface access forecasts

HAL's surface access revenues are driven by assumptions and modelling of passenger mode share to the airport. The main driver of HAL's forecasts are from off-model adjustments to its standard surface access modelling tools. In general, these adjustments are not adequately explained, and the changes made between the original RBP and the most recent update (RBP Update 1) are in some cases counterintuitive.

We have used alternative mode share estimates to model surface access revenues for our commercial revenue forecasts, broadly matching HAL's methodology. We assume that HAL's 2020 mode share assumptions are largely based on actual survey data. We also assume the changes in mode share between 2019 and 2020 are reflective of the impact of the COVID-19 pandemic. In line with HAL's assumptions, we assume mode shares return to normal (2019 levels) by 2024, before we account for other changes such as the terminal drop-off charge. Finally, we apply as overlays, the impact of the terminal drop-off charge and the introduction of Crossrail services on mode shares, as per HAL's assumptions.

We then separately consider the step-changes HAL has applied to its surface access revenue forecasts

COVID-related overlays: We have accepted the overlay HAL has proposed in its RBP to parking and rental income, as we understand why changes in the ratio of business to leisure passengers would affect average transaction values. However, we do not think the needs case has been met for the overlay related to HAL's proposed price reduction for Heathrow Express. We would like HAL to provide evidence showing how it determined that a ✂ reduction in yield (which we assume is a result of a reduction in ticket prices) is the revenue maximising strategy in response to demand moving away from Heathrow Express.

Crossrail overlay: We understand the logic underpinning HAL reducing ticket prices to compete more effectively with Crossrail services. Although HAL has not presented any evidence justifying the size of its proposed price reduction, material previously shared with CEPA during the iH7 business planning period provides some support evidence. As such, we consider the needs test has been met for this overlay and we use the same overlay as HAL. However, we do not apply our overlay to track access revenue, which we understand would remain unaffected.

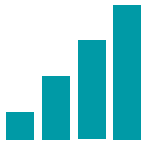
Terminal drop-off charge overlay: The terminal drop-off charge proposed by HAL will be introduced in Q4 2021 and will be applied to 'Kiss & Fly' and Taxi trips. HAL has not provided the underlying calculations it has used to estimate the revenue impact from the drop-off charge, but it has provided some of the supporting assumptions and parameters. We use the same assumptions in our revenue overlay, except for the mode share assumptions where we use our own, and one other parameter (vehicle occupancy) where we found evidence to support an alternate figure.

Our view of other elements of HAL's revenue forecasts

HAL's RBP includes commercial revenues from a number of other sources, such as property and services. It also includes forecasts for cargo revenue, which has increased in importance during the pandemic.

Other commercial revenues

In its RBP and subsequent presentations, HAL has presented a series of headwinds and opportunities related to **property revenues**. HAL expects that the COVID-19 pandemic leads to some long-term and short-term structural shifts in property revenues and has identified various management initiatives to mitigate the effect of the COVID-19 pandemic. **We have largely accepted HAL's proposed overlay to its property revenue forecasts but have changed the elasticity used to better align it with evidence around the sources of HAL's property revenue and the likelihood of such revenue being volume driven. We also include a separate management challenge adjustment.**



Service revenue includes commercial revenue from other services, with HAL listing areas such as advertising, the Fast-Track service, VIP charges, and aviation fuel. There is little discussion of, or adjustments made to, these in the RBP except advertising where HAL proposes a ✂ impact on advertising revenue (included within HAL's retail overlay). **We have adjusted the elasticity we use to project future service revenue and include a management challenge adjustment but make no other changes.**

Cargo revenues

HAL has a strong share of the cargo market, with 40% of UK exports and 62% of airfreight exports in 2019.[1] HAL experienced a 650% increase in cargo revenues between 2019 and 2020 in response to higher demand. However, HAL's forecasts do not reflect the actual increase in revenues experienced in 2020 and anticipated in 2021 and so, we present an alternative set of assumptions that reflects our expectation that cargo revenues will be higher than they have been historically due to spare capacity at Heathrow. Overall, **our forecasts assume higher cargo revenues than HAL although we assume revenues taper down towards the end of H7, when passenger numbers recover**.

1. HAL RBP Section 7.2 – Commercial Revenues

Commercial Revenues: Summary

HAL forecasts: *HAL mid pax forecasts, No RAB Adjustment*

2018 RPI, £m	2022	2023	2024	2025	2026
Retail excl. Bureaux	✂	✂	✂	✂	✂
Bureaux	✂	✂	✂	✂	✂
Surface access	✂	✂	✂	✂	✂
Service excl. surface access	✂	✂	✂	✂	✂
Property	✂	✂	✂	✂	✂
Rail	✂	✂	✂	✂	✂
Other	✂	✂	✂	✂	✂
Terminal drop-off charge	✂	✂	✂	✂	✂
Red terminal revenue (HMT)	✂	✂	✂	✂	✂
Minimal capex overlay	✂	✂	✂	✂	✂
Total	**442**	**546**	**618**	**653**	**656**
Total per passenger, £	10.63	9.71	9.41	9.28	9.11

Source: HAL Analysis

Notes:
- HAL and CEPA revenue forecasts are reported on a consistent HAL Mid pax forecast scenario.
- The Retail excl. Bureaux lines have been taken from HAL's model rather than the RBP Update 1 Commercial revenues chapter. Over the H7 period, the Retail revenue forecasts are approximately £180m higher in the model than in the chapter.

Cargo, £m	✂	✂	✂	✂	✂

Source: HAL Analysis

CEPA forecasts: *HAL mid pax forecasts, No RAB Adjustment*

2018 RPI, £m	2022	2023	2024	2025	2026
Retail excl. Bureaux	215	298	354	384	399
Bureaux	10	12	12	12	11
Surface access	91	118	125	137	142
Service excl. surface access	34	42	48	51	53
Property	113	118	121	123	124
Rail	72	91	94	100	103
Other	1	1	1	1	1
Terminal drop-off charge	53	63	68	82	78
Red terminal revenue (HMT)	16	6	0	0	0
Minimal capex overlay	0	0	0	0	0
Total	**603**	**749**	**825**	**891**	**912**
Total per passenger, £	14.51	13.33	12.56	12.67	12.66

Difference with HAL, £m	**161**	**204**	**207**	**238**	**256**
Cumulative difference, £m					**1,066**
Cumulative difference excl. capex overlay, £m					**875**

Cargo, £m	57	40	30	24	22

Source: CEPA Analysis

Scenario comparison: Total and per passenger revenues (commercial and cargo)

CEPA forecasts based on CAA passenger forecast scenarios: low, mid (base case) and high

***CEPA's forecasts under different CAA passenger forecast scenarios**: Total commercial revenues and cargo*

2018 RPI prices, £m	2022	2023	2024	2025	2026	H7
High	774	910	979	1,052	1,072	**4,788**
Mid	694	823	908	993	1,018	**4,436**
Low	449	598	755	848	919	**3,569**

Source: CEPA analysis

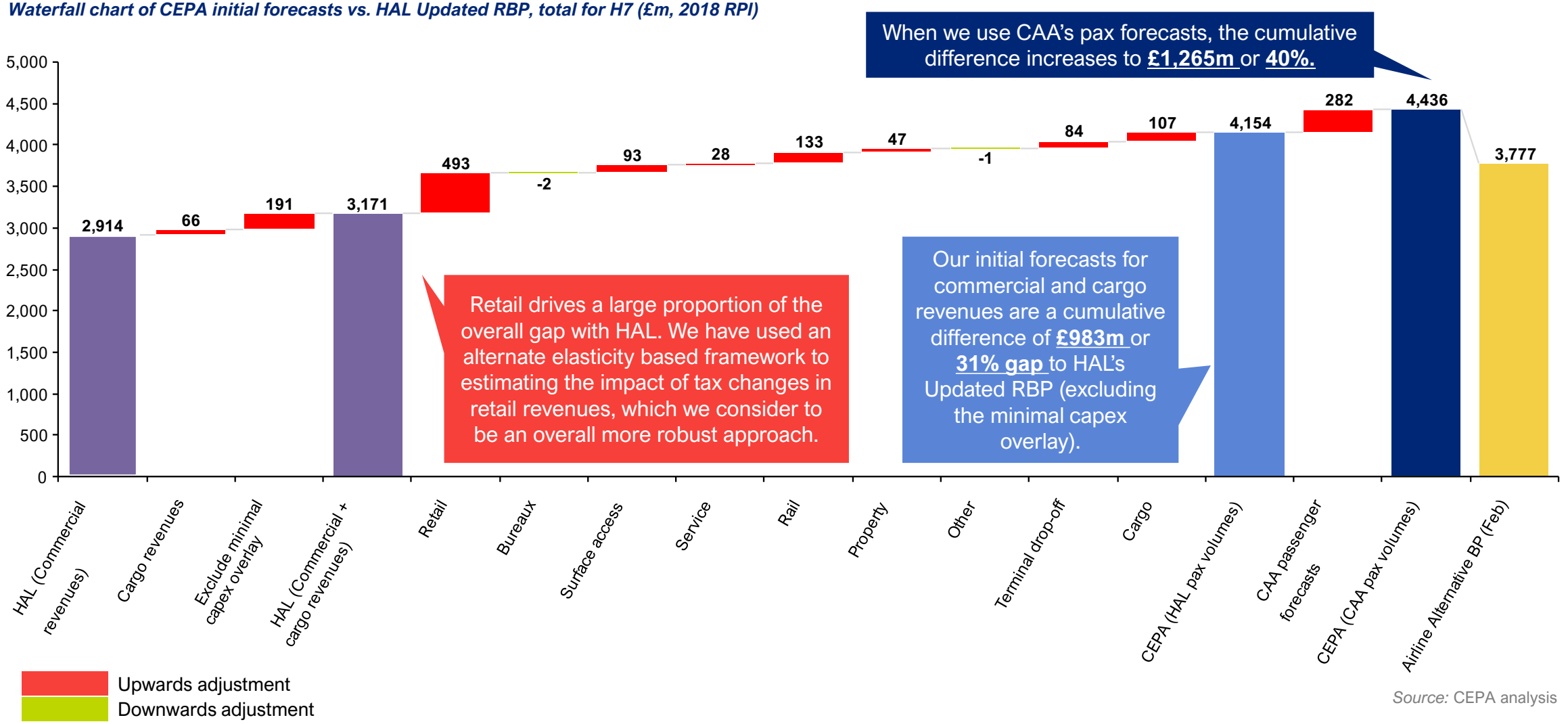
***CEPA's revenue forecasts under different CAA passenger forecast scenarios**: Per passenger commercial revenues and cargo*

2018 RPI prices, £	2022	2023	2024	2025	2026
High	14.29	13.13	12.22	12.20	12.14
Mid	15.21	13.68	12.61	12.51	12.42
Low	23.96	16.50	13.68	13.36	12.97

Source: CEPA analysis

Comparison of HAL and CEPA revenue forecasts

Waterfall chart of CEPA initial forecasts vs. HAL Updated RBP, total for H7 (£m, 2018 RPI)

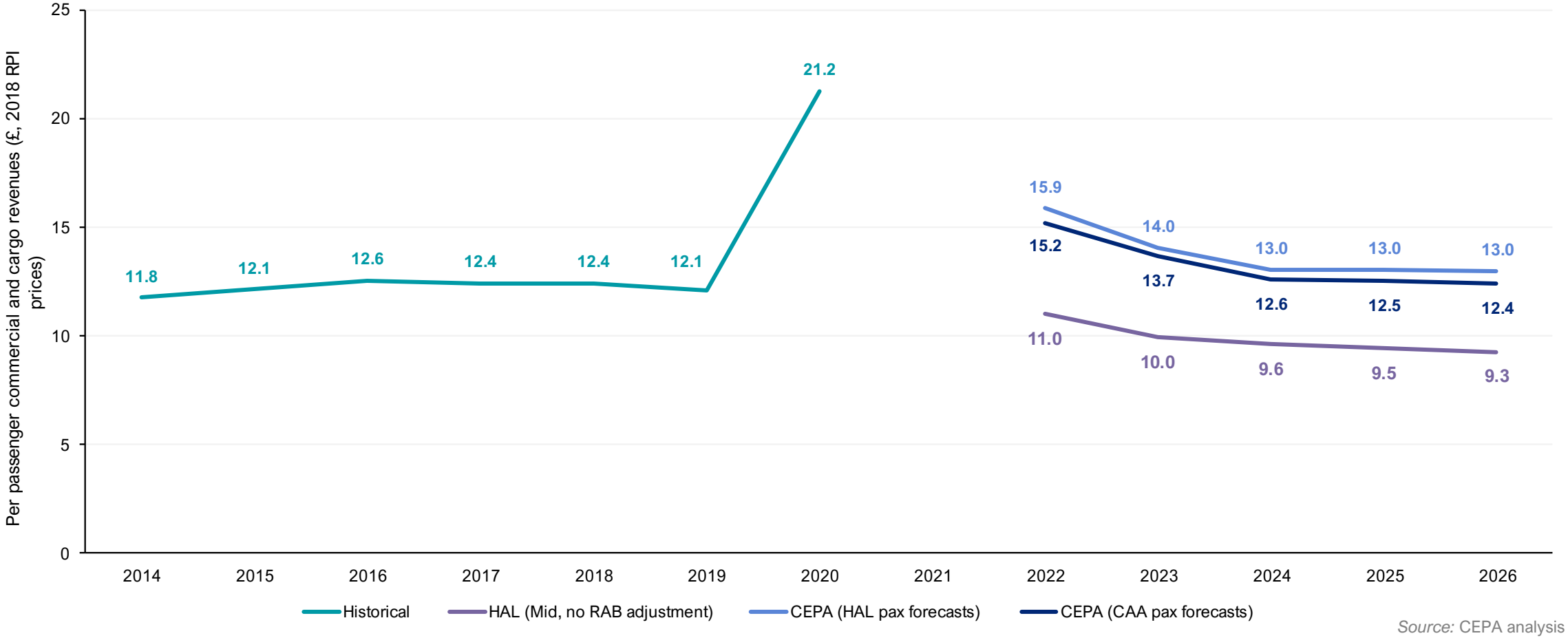


Source: CEPA analysis

Note: HAL and CEPA commercial revenue forecasts are reported on a consistent HAL Mid pax forecast scenario except for the final waterfall step which uses the CAA Mid pax forecast scenario.

Comparison of HAL and CEPA revenue forecasts

Comparison of per passenger commercial and cargo revenue forecasts



Source: CEPA analysis

Note: Both HAL and the CAA have developed High, Mid, Low pax forecasts for the H7 period. We use the Mid pax forecast for figures presented above.

Section One

Introduction

Background to this study

The next price control for Heathrow Airport Limited (HAL) – H7 – is due to run from 1st January 2022 to 31st December 2026.

- The Civil Aviation Authority (CAA) is now in the process of assessing HAL's Revised Business Plan (RBP), submitted in December 2020, and an updated version (RBP Update 1) provided on the 1st July 2021 (which was received part way through the preparation of this report).
- The CAA have commissioned CEPA and Taylor Airey to assist it with assessing HAL's forecasts of operating expenditure (opex) and commercial revenues – and in proposing an alternate set of efficient forecasts where appropriate.[1]
- This report sets out our initial assessment and forecasts, bringing together our review of HAL's approach to developing its opex and commercial revenue forecasts, any analysis we have undertaken to review the key assumptions, and our proposals for the alternate forecasts.

We set out in this report our initial review of HAL's:

Overall forecasting approach (Section 2)

- Approach
- Chosen baseline
- Indexation
- Scenarios

Opex forecasts (Section 3)

- Chosen baseline
- Elasticities
- People
- Operational costs
- Facilities and maintenance
- Rates and utilities
- Surface access
- Frontier shift
- Input price inflation
- Capital investment

Commercial / cargo revenues (Section 4)[2]

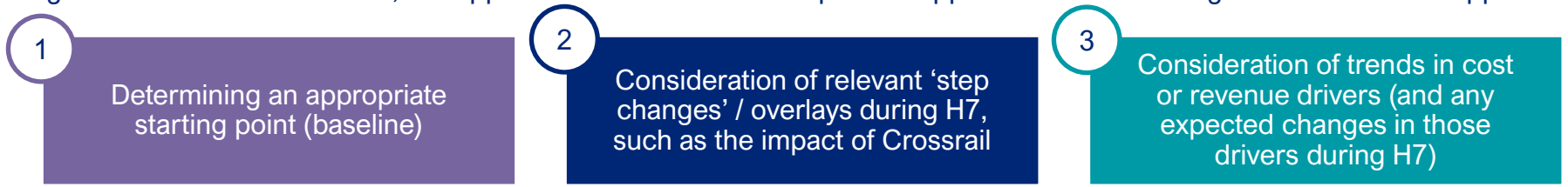
- Efficiency of 2019 figures as a baseline
- Elasticities
- Retail
- Surface access
- Property
- Other non-aeronautical revenues
- Cargo
- Capital investment

1. CEPA has led the review of commercial and cargo revenues and Taylor Airey the review of opex.
2. Although cargo revenue is not a commercial revenue stream, we have captured our forecasts of cargo revenue within the commercial revenues section

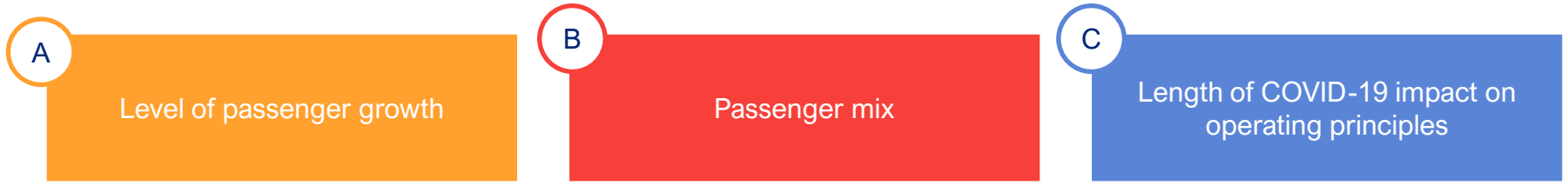
Our approach to the study

We have assessed the approach taken and rationale given, both by HAL and by its advisors, for the opex and commercial revenue forecasts and supporting assumptions in the RBP. We assessed this information 'as seen' and with reference to other situations including our understanding of regulatory precedent, passenger behaviour, and the market and economic factors in play. This approach has ensured that our review of HAL's operating costs and commercial revenues forecasts has been conscious of the situation in which HAL is operating, including step changes and if and how we can expect trends to change during H7.

- Where appropriate, we have also proposed our own forecasts, using alternative assumptions and analysis – we have also grouped together these forecasts to represent an alternative overall assessment of efficient opex and commercial revenues during H7.
- When determining our own efficient forecasts, our approach has focused on a top-down approach with three stages similar to HAL's approach:



- We also consider scenarios, which are based on three characteristics which impact drivers of opex and commercial revenues:



We have modelled multiple scenarios in our analysis using both HAL and CAA passenger forecasts. In this report, we present our results under HAL's mid passenger forecasts from the RBP Update 1, to allow for a like-for-like comparison with HAL's opex and revenue forecasts. Ultimately however, our opex and revenue forecasts are derived from CAA's passenger forecasts.

We have had limited direct engagement with HAL due to the short timescales available to develop our forecasts. As such, we have largely assessed HAL's RBP material "as is" with some small clarifications where straightforward to resolve. We expect there will be a need for more detailed engagement following the publication of these forecasts

Context to producing H7 forecasts

It is important to recognise that the H7 price review is being undertaken during an unprecedented period for the UK aviation industry as a result of the COVID-19 pandemic and its impact on the demand for aviation travel.

COVID-19 remains the biggest issue facing the aviation sector and is expected to continue to impact Heathrow Airport's operations during H7 even as governments worldwide start to reduce travel restrictions. This means that the CAA's H7 price control review – including the assignment the CAA has commissioned CEPA and Taylor Airey to undertake – is being undertaken in the context of considerable uncertainty.

This uncertainty makes forecasting HAL's opex and commercial revenues in H7 challenging. Given this context, our review of the HAL RBP has sought to account for the uncertainty of the short and medium term impacts of the COVID-19 pandemic on Heathrow as follows:

- As noted above, we have used a similar approach to produce forecasts of opex and commercial revenues as HAL has applied to produce its RBP and have assessed the various overlays HAL has proposed to account for the impact of the pandemic on Heathrow's operations.
- This has helped to ensure consistency in our respective forecasting approach and form of assumptions used to account for the impact of pandemic, including the relevant overlays HAL has identified to its baseline (2019) operations.
- We have also sought to identify opportunities that the pandemic could provide HAL to evaluate how it structures its operations and commercial strategies going forward as the sector recovers from the impacts of the pandemic.

We have attempted to produce a balanced set of forecasts – not relying too much an overly optimistic or overly conservative assumptions. We have also attempted to make our efficiency challenges credible and deliverable within the timeframe available to HAL.

However, there still remains a substantial amount of uncertainty in any set of opex and commercial revenue forecasts for H7. Given the level uncertainty it may be this needs to be managed by the CAA through other mechanisms in the H7 regulatory framework (e.g. risk sharing / uncertainty mechanisms) to avoid adverse outcomes for users and/or the airport operator in H7.

We understand the CAA is considering a number of regulatory framework changes for H7 as part of price review process which were not part of CEPA and Taylor Airey's scope of work for this assignment. In light of the findings of our initial review of the RBP, we would support the CAA continuing its discussions with stakeholders on different options for managing uncertainty as part of the H7 regulatory framework.

Quality assurance statement

Reasonableness of analysis / scope for challenge

We have undertaken our initial assessment over a relatively short period of time, given constraints on the price control determination timetable. The time limitations have meant we have not been able to undertake detailed assessments of all aspects of HAL's RBP, and our assessment of the material presented by HAL has largely been 'as seen,' with some limited opportunities for clarification. Nevertheless, we consider we have undertaken proportionate analysis for this stage of the price control determination process and have appropriately prioritised the areas of HAL's RBP that are most consequential for the resultant forecasts.

Our analysis primarily relies on material presented by HAL and other publicly available sources of evidence. The quality of evidence available varies but within our report we have highlighted the key areas where further evidence would strengthen our analysis. Similarly, we highlight where the assumptions we are using could be strengthened by evidence from HAL or other stakeholders. We would welcome any evidence that would support us in validating these assumptions.

Quality assurance / robustness of analysis

The analysis underpinning our forecasts relies on relatively standard approaches to cost and revenue efficiency assessment. We have used appropriately skilled and experienced staff to both undertake and review the analysis, and we have allowed sufficient time to both develop the analysis and quality assure it. We have undertaken several layers of quality assurance:

- A sense check of all the analysis by the respective CEPA and Taylor Airey technical leads, as well as the CEPA Project Director and CAA staff
- A review of modelling inputs for transcription errors, and a similar review of report tables produced from our model for transcription errors
- A review of model logic and calculations within our spreadsheet model, with a higher level review by the CEPA Project Director and CAA staff

Uncertainty

Our opex and commercial revenue forecasts have been produced under a backdrop of substantial uncertainty, relating to the speed of recovery of passenger numbers, the extent to which the COVID-19 pandemic leads to permanent changes in the passenger mix, and the extent to which the COVID-19 pandemic will lead to permanent changes in how Heathrow operates as an airport. We have sought to address this through our use of coherent scenarios and overlays applied to standard cost and revenue forecasting approaches. However, there remains a substantial amount of uncertainty in any set of opex and commercial revenue forecasts for H7, and we consider there is scope for further mitigation through the use of a wider range of scenarios and risk sharing/uncertainty mechanisms.

Section Two

Review of HAL's overall forecasting approach

HAL's forecasting approach

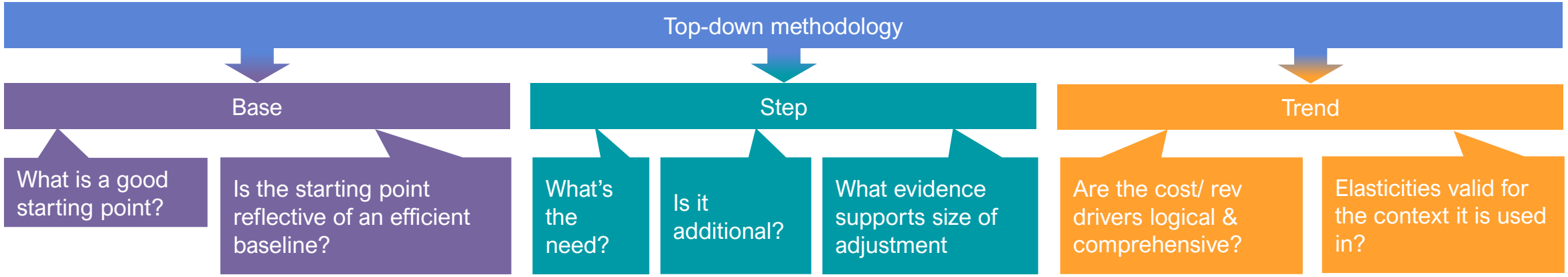
HAL has adopted a relatively standard Base-Step-Trend approach to producing its RBP forecasts:

- **Base:** For its starting point year HAL has chosen to use a 2019 base (i.e. a pre-pandemic year), as opposed to using a 2020 where the impact of the pandemic was felt. HAL also assumes its 2019 baseline opex and commercial revenues are both efficient – and have therefore made limited efficiency adjustments.
  - The approach of using a 2019 base is the most pragmatic option – there are issues with this (as discussed within this report), but in the time available and given the information we have access to, we consider the approach to be reasonable.
  - However, we have identified a number of issues with the evidence HAL has provided around the efficiency of the 2019 base. This evidence base has been reviewed and challenged as part of our analysis.
- **Step:** HAL has applied several top-down overlays, or 'step' changes' to both opex and commercial revenues, mostly relating to the COVID-19 pandemic.
  - In a few areas, the logic underpinning the inclusion of overlays is not provided and the evidence around the size (£m) of overlays requested is not always sufficiently substantiated. However, the updated RBP includes a lot more detail around the forecasts.
- **Trend:** HAL has taken a top-down approach of applying cost/revenue drivers and associated elasticities.
  - We consider the evidence around the elasticities is stronger than the evidence HAL provided in the run-up to the iH7 price control. But we consider they may be more scope for scenario-based analysis given this presents a key area of uncertainty.

Our forecasting approach

HAL has applied several overlays to both its opex and commercial revenue forecasts, citing the impact of the pandemic, structural shifts to consumer needs and demands, etc. Although we understand the rationale behind this approach, each overlay takes away from the relatively simple forecasting approach originally adopted. A more robust, transparent approach would have been to do a full bottom-up assessment – where, for certain categories of cost or revenue that are affected by substantial step changes, the costs/revenues are built-up based on the new operating structure.

In the time available to produce this report, and with the data/information we have had access to, it has not been feasible for us to take a fully bottom-up approach. We have, therefore, mimicked HAL's forecasting approach, disaggregating where necessary and feasible. We have identified the key assumptions that drive HAL's forecasts, challenged the evidence base underpinning them, and where necessary, presented alternate assumptions that are supported by a stronger logic or evidence base.



- 2019 is a pragmatic start year.
- We have reviewed previous CAA and HAL-commissioned evidence.
- We have validated the starting point of key sub-categories with bottom-up analysis.

- We tested the logic and evidence for the need and additionality of step changes.
- Where HAL's evidence for the size of their adjustment is inadequate, we produce alternate estimates using other evidence sources or using transparent assumptions.

- We review any econometric analysis used to support the elasticity estimates.
- We derive 'bottom-up' elasticities where more appropriate.

Cross-cutting issue: Choosing a start point

A key challenge in the context of the current price control is the suitability of historical cost and revenue evidence to inform future efficient costs and revenues.

- COVID-19 may have fundamentally altered the relationship between key cost/revenue drivers and outturn costs and revenues. That may make historic efficiency analysis, less relevant and potentially misleading:
  - For example, closure of terminals and staff redundancies forced on by the pandemic, may allow for a reconsideration of whether newer more efficient practices can be implemented in the recovery period.
  - Alternatively, if the pandemic leads to a longer-term shift in passenger mix, this may affect the appropriate retail offer necessary and in turn, affect the likely retail concession income.
- This means the relevance of 2019 costs and revenues for future costs and revenues, is likely to be limited.
  - However, we don't know what the future relationship between inputs (passengers, terminal space etc.) and outputs (costs, revenues) may be. Choosing a 2019 base is, therefore, a pragmatic option.
  - Using 2020 figures as a base is an option – but it poses an additional challenge in terms of removing any one-off pandemic-related impacts, and in terms of applying appropriate elasticities (the elasticities we have access to are designed to be used for marginal changes in passenger numbers).

Cross-cutting issue: Elasticity calculations

Elasticity estimates derived econometrically are only really applicable for marginal changes to the cost and revenue drivers, e.g. small increases and reduction in/of passenger volumes. For H7, these elasticities are being applied to large changes in revenue drivers. Despite this issue, we recommend continuing with this approach in the absence of better elasticity evidence.

HAL calculates their volume driven forecast with 2019 as their base year – for each forecast year, the elasticity is applied to changes in the cost or revenue driver between 2019 and the forecast year. For example:

$$\text{VolumeEffect}_{\text{ForecastYear}} = \left(\frac{\text{Driver}_{\text{ForecastYear}} - \text{Driver}_{2019}}{\text{Driver}_{2019}}\right) \times elasticity$$

$$\text{Cost}_{\text{ForecastYear}} = \text{Cost}_{2019} \times (1 + \text{VolumeEffect}_{\text{ForecastYear}})$$

This is a departure from the typical approach of applying the elasticity to year-on-year changes to the driver. However, given our concerns (see below) around applying elasticities to large changes in the drivers, we consider HAL's approach to be less distortionary than the typical approach.

Applying point elasticities to large changes in drivers:

- For some revenue categories, HAL's elasticity estimates are being applied to large changes in the drivers. For example, retail revenues are being forecast with respect to changes in passenger volumes – as much as a 35% reduction in 2022 relative to 2019.
- Elasticities, where derived econometrically, are typically estimated on marginal changes and so there is less certainty that the estimates are appropriate for the scale of change being anticipated during H7. Elasticity effects are typically non-linear.
- However, the scale of change in passenger volumes during H7 is largely unprecedented. As a result, no evidence exists around the impact of large changes in passenger volumes (or other drivers) on opex or commercial revenues. So, in the absence of high quality evidence on elasticities based on the very recent developments in the aviation sector, we adopt a similar approach to HAL

Cross-cutting issue: Inflation index

The choice of inflation index relates to four distinct areas:

- RAB indexation, which is not relevant for our study;
- To present form of price cap (i.e. RPI - X, CPIH - X), which is also not directly within the scope of our study, but relevant for the next issue;
- To deflate / inflate historic costs and revenues; and,
- To index future costs and revenues – inappropriate to use RPI.

HAL has used RPI to deflate / inflate historic costs and revenues. This is inappropriate as it creates a misleading impression around historic opex and commercial revenue growth. Specifically, it:

- Implies opex has fallen by more in real terms than is actually the case, and it
- Distorts any assessment of HAL's historic outperformance of the CAA forecast.

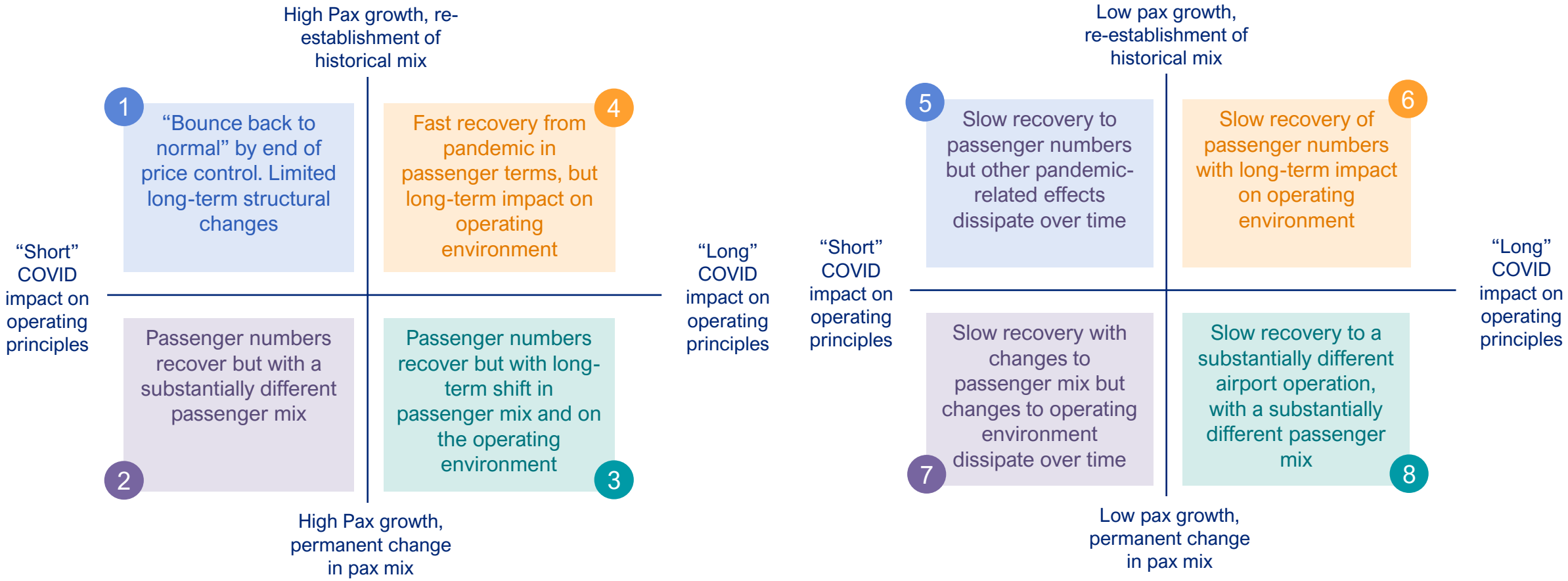
HAL also assumes its commercial revenues and certain categories of opex will grow in nominal terms by RPI. Other categories of opex have been indexed using bespoke indices. The use of RPI is inappropriate in this context also as it is an inaccurate measure of economy-wide inflation.

CPI is widely recognised as a more appropriate measure of inflation, though we must recognise that it is set based on consumer spending patterns and not the spending patterns of a regulated company such as HAL. It is therefore appropriate to consider whether the prices for certain costs and revenues will grow by another price index. However, this should be done with reference to CPI.

To aid comparisons with HAL's analysis, we are using a 2018 price base in this report, using RPI as the deflator. Nevertheless, in our analysis of HAL's historic performance, we have deflated by CPI to allow us to make appropriate comparisons across years. We also assume costs and revenues will grow by CPI in nominal terms, with a separate allowance for real price effects where necessary.

Cross-cutting issue: Incorporating scenarios

The scenarios considered by HAL (and being considered by the CAA) are predominantly linked to the pace of recovery in passenger numbers. But it is possible to create scenarios that reflect the other key areas of uncertainty:



Testing how these different scenarios affect the forecasts of efficient opex and commercial revenues may inform whether it is in the consumer interest to adopt a different risk sharing mechanism than has been adopted for previous price controls.

Section Three

Opex forecasts

A. Efficiency of 2019 figures as a baseline
B. Elasticities
C. People
D. Operational costs (incl. Insurance)
E. Facilities and Maintenance
F. Rates, Utilities and Distribution Contract
G. Surface access initiatives
H. Frontier shift and input price inflation
I. Capital Investment
J. Overall results

Section Three

Opex forecasts

A. Efficiency of 2019 figures as a baseline

2019 and the need for baseline adjustments

In this section we consider three issues:

1. **The efficiency of 2019 as a baseline** – We consider whether the information presented by HAL demonstrates it was operating at the frontier of efficiency in 2019.
2. **HAL's adjustments to its 2019 baseline** – We review whether the adjustments HAL makes to its 2019 costs before using it as the basis of forecasting, are appropriate, considering both the reasons for adjustments and the size of the adjustment made. In particular, we are looking for evidence to show that staff costs associated with the Heathrow Expansion Programme have been fully removed and that these are not included in the base and projected forwards.
3. **Actions taken since 2019** – We review the extent to which HAL's cost control actions taken in 2020 and 2021 are sustainable and can be carried forward into the H7 period.

The tests above are used to inform our assessment of the need for an adjustment to our 2019 opex to make it a suitable baseline for our forecast. We summarise our findings in the table below:

Comparison of HAL and Taylor Airey views regarding the efficiency of 2019 as a base and the need for adjustments:

	HAL	Taylor Airey			
	£m (nominal)	£m (nominal)	Rationale	Category	Period
1 Efficiency of 2019 as a baseline	✂	-17	We have considered average productivity achieved in the last 3 years of the Q6/ Q+1 period to smooth variations in individual years, in particular, opex increases in 2019.	Pro-rated across categories	From 2020
2 HAL adjustments to 2019 baseline:	✂	✂	We have used HAL's proposed adjustment for the removal of expansion costs, pending further assessment. And we allow some of HAL's overlay for the London Living Wage, but we consider further evidence is required before allowing the full overlay.	Multiple	From 2020
3 Actions taken since 2019	✂	✂	At least 50% of the ✂ (2018 RPI prices) benefits of reorganisation identified by HAL would be expected to be sustainable.	People	From 2020

Source: Taylor Airey analysis, HAL Analysis

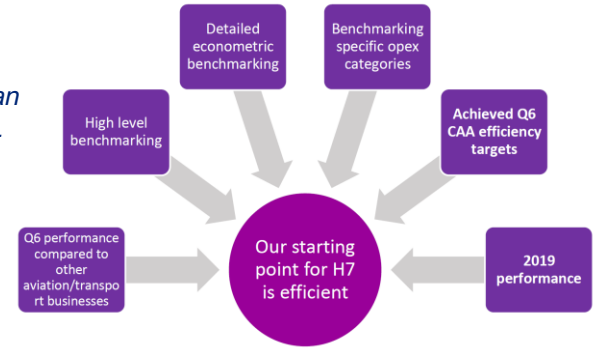
1. Efficiency of 2019 as a baseline: HAL and airline views

Whilst HAL presents sources which corroborate that efficiencies have been made in Q6, there is disagreement over the conclusion that 2019 is an efficient starting point.

HAL claims that 2019 presents an efficient baseline from which to project future opex.[1]

Sources of evidence used to support HAL claims that 2019 is an efficient starting point – from HAL RBP

Figure 5: Overview of evidence for efficient starting point for H7



HAL demonstrates that it has achieved a reduction in operating cost per passenger of 14% from 2014 to 2019, meeting CAA overall savings targets, and also asserts that it benchmarks well against peers. Benchmarking at various levels is cited as evidence:

- Comparing Q6 outturn opex with other aviation/ transport businesses.
- High level Frontier Economics' comparison of ATRS data.[2]
- Benchmarking specific categories of opex by Steer and the Airport Benchmarking Group.[3]
- KPMG's econometric benchmarking report, which finds that HAL is at the efficiency frontier in 2018.[4]

NYRAS PA Consulting (on behalf of airlines) find that:[5]

- The passenger growth rate during Q6 was over four times the CAA forecast (1.8% vs 0.4% CAGR) and in total passenger volumes have actually been 5% higher than forecast (367m vs 348m).
- HAL has benefited from the accelerated passenger growth by being able to leverage its high fixed cost base. It would have therefore been reasonable to expect the CAA unit cost targets to be exceeded.

Airlines conclude that:

- The use of 2019 as a comparative baseline provides ease when verifying HAL's business plan.
- However, the driver based econometric model may result in unnecessary discrepancies versus the 2019 baseline.

1. Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7.1: Operating Costs
2. Frontier Economics (2019) Developing opex and commercial revenue elasticities for H7
3. Steer (2019) Operating Cost Benchmarking Study
4. KPMG (2019) Airport Operating Cost Efficiency Benchmarking Report for Heathrow Airport Limited
5. PA Consulting (Nyras) (2020) Operating Cost Report and Presentation 2021.03.02 - Airline Community Presentation to CAA_RBP Feedback and ABP_Final

1. Efficiency of 2019 as a baseline: Our view

We propose that the 2019 baseline is adjusted down by 1.4%, £14.4m (2018 CPI) to represent an efficient starting position. This is derived from considering average productivity achieved in the last 3 years of the Q6/ Q+1 period and smoothing variations in individual years.

While there is general consensus that HAL's Q6 performance shows improvement across the period, this does not imply that efficient levels have been achieved.

Although HAL did meet the Q6 price control targets, this was not universal across all categories of cost and People costs were a notable exception.

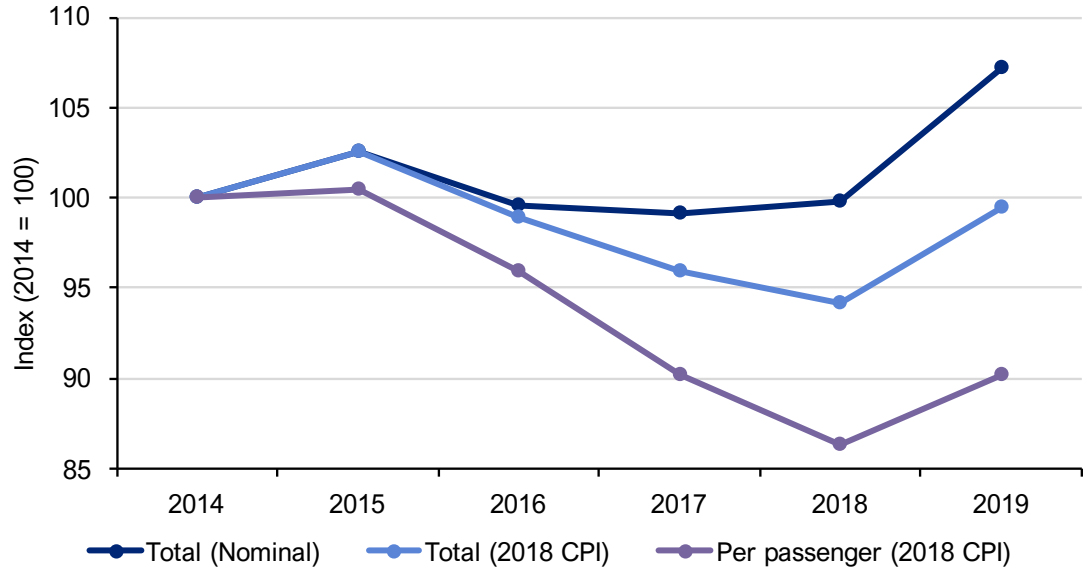
We also considered that HAL's opex benchmarking against others did not provide compelling evidence. For example, the data used is dated and it is not always clear that comparators chosen are directly relevant.

Comparison between 2019 and 2018 opex

2019 opex data did not form part of the KPMG study[1] that HAL uses to support their case for being at the efficiency frontier. As we show on the right, opex in 2019 has increased from 2018 levels (the last year considered by KPMG).

- There has been a 6% increase in total opex (nominal) and 5% increase in opex per pax.
- Most notably, this included a 29% increase in General Expenses, 15% increase in Operational costs and 11% increase in Utilities costs.
- The reasons for these increases are not clearly provided but it cannot be explained by volume effects.

HAL opex over Q6 (2014-2019)



HAL opex over Q6 (2014-2019)

Expenditure	2014	2015	2016	2017	2018	2019
Total (£m, nominal)	1,123.3	1,152.4	1,119.0	1,114.0	1,120.7	1,204.0
Total (£m, 2018 CPI)	1,190.2	1,220.4	1,177.5	1,141.5	1,120.7	1,183.0
Per pax (£, 2018 CPI)	16.2	16.3	15.6	14.6	14.0	14.6

-1.4%

Average 2017 – 2019 14.4

Source: Taylor Airey analysis of HAL data

1. KPMG (2019) Airport Operating Cost Efficiency Benchmarking Report for Heathrow Airport Limited

2. HAL's adjustments to the 2019 baseline

HAL proposes three main adjustments to the 2019 baseline before using it as the basis for forecasting:

a. Removal of costs associated with Expansion

b. Removal of a one-off credit associated with the pension cost actuarial valuation

c. Addition of London Living Wage

We summarise our findings in the table below, and consider each of these in detail on the following pages.

Comparison of HAL and Taylor Airey views regarding HAL's proposed adjustments to the 2019 baseline

	HAL	Taylor Airey			
	£m (nominal)	£m (nominal)	Rationale	Category	Period
a Expansion	-1.8	-1.8	We have used HAL's proposed figure, pending further assessment.	General Expenses	From 2020
b People cost credit removal	1.9	-	Insufficient detail provided to fully assess whether this adjustment is appropriate, or whether this adjusted is already accounted for within the baseline figures we have chosen to use.		
c London Living Wage	✂*	✂	No evidence is presented to show why an adjustment is unavoidable and why supplier's wage increases cannot be mitigated by the suppliers.	Facilities and Maintenance	From 2022
Total	✂	✂			

Source: Taylor Airey analysis, HAL Analysis

Note: ✂

2. HAL adjustments to 2019 baseline: Expansion

It is difficult to assess whether Expansion costs have been fully removed without a detailed deep-dive review of the capitalisation treatment of these costs and the resultant impact on opex. This would require more detailed disclosure from HAL than is currently available.

HAL states that it has fully removed costs associated with expansion with a £1.8m (nominal) reduction from general expenses. In the RBP Update, HAL refers to its 2019 Category B submission, explaining that this figure represents two main areas of spend: [1]

> *"CAA Fees - the charge from the CAA to fund the additional headcount required to support the CAA's activities directly related to the development of the expansion of Heathrow. This has been completely categorised as Category B.*
>
> *Security - The Heathrow Expansion Programme activity has increased the threat of protestor activity. Additional security resource has been provided to mitigate this risk directly caused by our proposals to seek planning consent".*

Our view: Assessing whether Expansion costs have been fully removed from the baseline requires a detailed understanding of the capitalisation of staff and professional services costs which has been applied. As a principle, we are concerned that a lack of clarity in the treatment of capitalised staff costs in the Statutory and Regulated accounts may disguise inconsistencies or double counting. We also note that concerns were raised early in the H7 process regarding capitalisation of staff costs[2] and cost and revenue allocation[3].

Pending further assessment, we would suggest that £1.8m nominal is removed from the base, in line with HAL's proposals.

1. Heathrow Airport, RBP Update 1 H7 Operating Cost Updates Section 5.4.3
2. CAP1563c, Review of Efficiency of Operating Expenditure of Heathrow Airport, by CEPA, June 2017
3. CAP1676 A study of Heathrow's cost and revenue allocation, by PA Consulting, June 2018

2. HAL adjustments to 2019 baseline: Pension credit and London Living Wage

b. Removal of one-off credit

HAL states that it has reversed a one-off credit from people costs with a value of £1.9m (nominal). The RBP Update[1] explains that this is related to removal of a one-off credit associated with the pension cost actuarial valuation and therefore should not be included in the baseline for H7.

Our view: There is insufficient detail provided in the RBP and associated documents to fully assess whether this adjustment is appropriate. **At this stage we are therefore not making an adjustment for this factor.**

c. London Living Wage

Heathrow Airport were accredited as a Living Wage Employer by the Living Wage Foundation in 2017. This involved making a commitment that directly employed staff and all workers in the supply chain will be paid the London Living Wage.

Since then, we note that London City airport have also followed Heathrow's lead and made a similar commitment. In the IBP, it was assumed that this would be achieved from 2020 but the target date was deferred to 2022 as a result of the pandemic. HAL states that in 2019 only 64 out of 108 suppliers were paying the London Living Wage.

To achieve this target, it proposes to adjust Facilities and Maintenance upwards by ✂ pa (2018 RPI prices) from 2022.

Our view:

We agree that this is a topic that may have the effect of causing upwards pressure on contract costs. We also note that airlines are in principle, not opposed to the payment of the LLW to workers in the supply chain. However, no evidence is presented to show why an adjustment is unavoidable and why supplier's wage increases cannot be mitigated by the suppliers themselves. For example, rather than passing costs on to the customer, it could be assumed that higher levels of pay may lead to improved staff morale and motivation and reduced turnover, with resultant increases in productivity.

As employers of large staff groups, HAL's supply chain have been subject to various changes in social and employment conditions over previous periods and the changes proposed in H7 could be considered business as usual.

No evidence is presented to provide a breakdown of the ✂ pa cost making it impossible to assess its efficiency.

Given our difficulty in determining the need, additionality and efficiency of HAL's proposed overlay for the London Living Wage, we propose applying a 25% efficiency adjustment to HAL's proposals, subject to any additional supporting evidence provided by HAL for the final forecasts. This means we allow for a ✂ (2018 RPI prices) / ✂ (nominal) addition to our baseline.

1. Heathrow Airport, RBP Update 1 H7 Operating Cost Updates Section 5.4.3

3. Actions taken since 2019

Having considered what changes to the cost base from 2019 to 2020 are temporary and what is sustainable over H7 period, we conclude that at least 50% of the ✂ pa (2018 RPI prices) benefits of reorganisation identified by HAL should be built in as a baseline adjustment.

HAL states that £260m (2018 RPI prices) of operating cost reductions have been delivered in 2020 compared with 2019 costs

- Material components include: ✂ in People cost category, ✂ contract cost reduction, ✂ from terminal consolidation, and ✂ removal of discretionary spend.
- However, it suggests that very little of these savings can be sustained in H7 and costs will return as volumes increase (see table overleaf).

Airlines note that:

- There are further opex savings that should be carried forward into the H7 period.
- Specifically, airlines would expect that benefits from structural change cost savings from re-organisation of people should be carried forward.

Our view:

We agree that some of these changes are temporary and will be reversed or superseded prior to H7, for example temporary pay reductions, furlough scheme. However, benefits from organisational change and revised contract terms would be expected to be retained despite future volume growth.

HAL also notes that some of the Magenta benefits are delivered through back-office FTE reductions which won't be counted in H7 years as it has already been realised in 2020/21. It would be inconsistent if these costs were then assumed to return.

We would also expect that some areas of contract costs or discretionary spend described as non-essential would not need to be retained.

We therefore propose to apply a ✂ pa (2018 RPI prices) saving to account for these issues, representing 50% of the total savings identified by HAL for organisational change.

Sources:

CAP1563c, Review of Efficiency of Operating Expenditure of Heathrow Airport, by CEPA, June 2017

CAP1676 A study of Heathrow's cost and revenue allocation, by PA Consulting, June 2018

2021.03.02 - Airline Community Presentation to CAA_RBP Feedback and ABP_Final

3. Actions taken since 2019: Summary of HAL and Airline views

The table below summarises HAL and airline views on long term impact of opex savings achieved since 2019:

Category	Savings identified by HAL (2018 RPI)	Description	HAL view [1]			Airline view [2]		
			Temp	Vol	Perm	Temp	Vol	Perm
People	✂	Temporary pay reductions of 10-25% for all colleagues	**Fully**			**Fully**		
	✂	Negotiated grade reorganisation (>1100 fewer roles through voluntary severance, redundancies or leavers not being replaced)		**Part**	**Part***			**Fully**
	✂	Non-negotiated grade reorganisation (~500 fewer roles through voluntary severance, redundancies or leavers not being replaced)		**Part**	**Part***			**Fully**
	✂	Furlough scheme (2020 annualised average 1,336 FTE/ month furloughed, 3,329 FTE in May)	**Fully**			**Fully**		
	✂	Other measures including reductions to overtime, bonuses and contractors				**Part**		**Part**
	✂	(Capitalisation of staff costs)				**Part**		**Part**
	✂							
Operational costs	✂	Contracts – various actions		**Fully**				
Maintenance	✂	Consolidation of terminals		**Fully**				
General Expenses	✂	Reduction in marketing and digital, retail and media, consultancy studies, VIP/fast track and noise and community	**Part**	**Part**				

* The potential for some long-term benefits from these reorganisations is mentioned in the RBP text but benefits are not costed in HAL's H7 forecasts.

Definitions:

Temporary	Savings will be reversed in the short term and cannot be applied to H7 period
Volume	Costs will return in H7 when volumes return
Permanent	Savings are structural and reduce the cost base for H7

1. Savings from Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7.1: Operating Costs
2. Airline views from Airline Community CAA RBP Review: Operating Costs & Commercial Revenues 4th February 2021

Section Three

Opex forecasts

B. Elasticities

Elasticities and key assumptions

Summary of elasticities and key overlay assumptions being proposed, and the evidence base behind them

Area	HAL	Frontier	Discussion of source and appropriateness
Elasticity of **People**, **Utility** (excl. Distribution Contract) and **General Expenses** cost categories with respect to passenger numbers	✂	✂	HAL references Frontier Economics (2019) benchmarking of other airports total opex. Frontier note that no plausible elasticities can be determined from analysis of HAL historic data at a total opex level. In each category, it finds no relationship with passengers, movements, or floorspace for any category except Facilities and Maintenance. **We note that parts of some categories would not be expected to be volume related e.g. marketing or professional services (consultancy) costs.**
Elasticity of **Operational costs** (excl. Insurance) with respect to passenger numbers	✂	✂	This is revised down in the RBP Update 1 to 50% of the ✂ previously used. HAL suggests that it has not been able to achieve cost savings in 2020 and 2021 in line with this elasticity as a number of the contract costs in this category such as Police and air navigation services (ANS) costs are 'fixed' and driven from the contract. We agree that the contract conditions will drive future projections rather than volume. **We would suggest that an elasticity of zero could be applied if the modelling was done at more granular level (see later section).**
Elasticity of **Facilities and Maintenance** costs with respect to terminal size	✂	✂	Frontier note that, "the single elasticity for facilities & maintenance is of limited use in isolation. It is necessary to combine this figure with a separate forecast for every other opex category to produce the total opex forecast". **A more consistent interpretation of this evidence would therefore be to apply the ✂ total opex elasticity to all categories, including Facilities and Maintenance.**
Rates	Growth in line with RPI	-	HAL states that actual business rates value will be as a result of re-valuations during the H7 period. **As in other areas, we suggest a CPI-based index.**
Insurance costs	✂ incr. pa	-	HAL do not apply a volume elasticity but use a number of inflationary multipliers and overlays to represent their view of market pressures. **See later section.**
Electricity distribution fee contract	Based on contract	-	HAL states that the contract was renewed in 2016 and forms the basis of the forecast. **Details of the contract to be reviewed for final assessment.**

1. Savings from Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7.1: Operating Costs

Elasticities: Comments on HAL's proposals

General

We would expect that it should be possible to disaggregate the cost categories and their drivers to apply elasticities for each category rather than applying a single elasticity to passenger growth to all main categories.

This would more accurately reflect the expected driver of each category and more clearly show which costs should be volume related and which are more fixed in nature.

Within the main categories, we would also expect there to be significant differences between the elasticities that should be applied to the various components of cost that make up that category. An example of how a more granular approach may affect the forecasts is illustrated with our alternate analysis of People costs in a later section.

Our proposed approach

Based on historical precedent ✂, we assume that opex has an overall elasticity with respect to passenger numbers of 0.4. We have, therefore, tried to ensure our proposed elasticities for each category aggregate to an overall elasticity of 0.4.

- For categories of opex where we have been able to derive a specific elasticity with respect to passenger numbers (namely operational security staff), we have used this elasticity.
- For categories of opex that are clearly unrelated to passenger numbers, we have used an elasticity of 0.
- For the remaining categories, we use an average elasticity such that the overall elasticity is 0.4.

Further commentary on our proposed elasticities is included in the relevant sections.

Section Three

Opex forecasts

C. People

People: Summary of HAL's proposals

People: *Security staff, operational staff, non-operational staff, and pensions*

2018 RPI prices	2022	2023	2024	2025	2026
2019 start point	368.2	368.2	368.2	368.2	368.2
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

- Baseline adjustment due to benefits from Cost of Change programme: ✂
- Efficiencies from Frontier Shift assumption
  - 0.1% pa from 2022
  - Total ✂ across H7

People: *Security staff, operational staff, non-operational staff, and pensions*

Nominal	2022	2023	2024	2025	2026
2019 start point	✂	✂	✂	✂	✂
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

- Terminal growth overlay due to continued closure of Terminal 4 to all arrivals until June 2023

People cost elasticities: Our view

HAL uses a single elasticity (✂ to pax) for all categories including People. Having reviewed the evolution of Q6 People costs, we suggest there is a need to consider elasticities at the lowest possible level of granularity, particularly with the uncertainties of the H7 period.

As with any airport business, HAL's total staff costs arise from:

- Staff groups whose cost would be expected to vary in line with volume, for which it may be appropriate to apply an elasticity – Security and Other operational
- Staff groups whose cost would be expected to be driven by other factors – Non operational

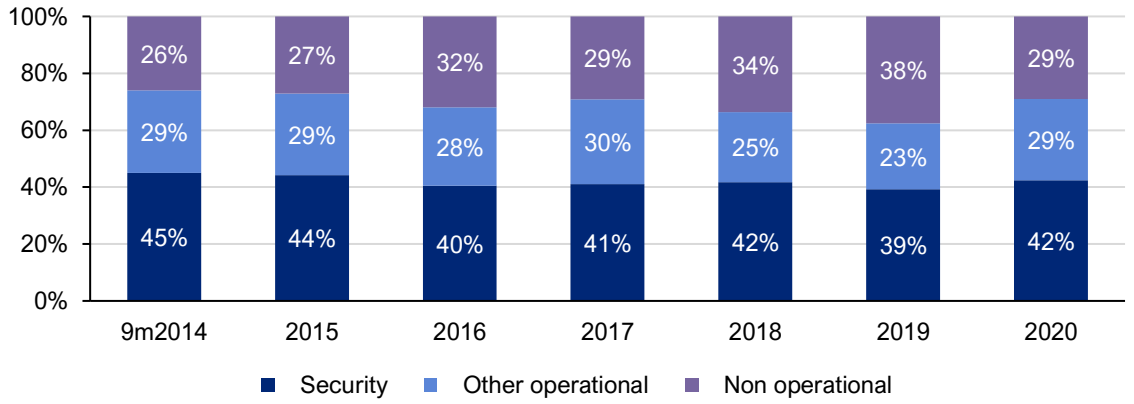
As illustrated by the analyses right, the proportion of the overall staff cost base arising from these different groups has changed significantly over the Q6 and iH7 period.

The lower chart clearly illustrates that:

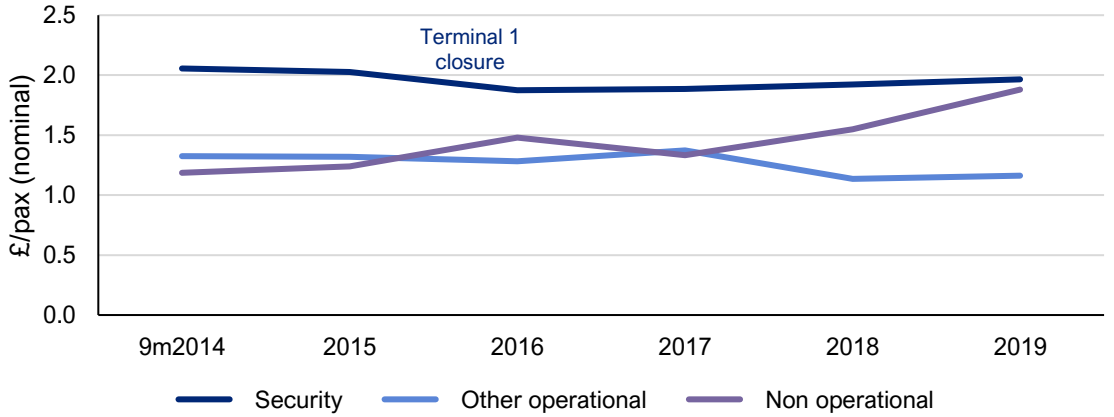
- non-operational staff costs have no relationship with passenger numbers; and,
- other effects such as terminal utilisation can produce effects which could otherwise be interpreted as efficiencies.

While the use of a single elasticity to volume may be appropriate to forecast overall People costs in a relatively stable period, we conclude that caution should be exercised when deriving historical elasticities from the Q6 period or applying them in this way to forecast H7.

Proportion of People costs (excl. Pensions) arising from different staff types



People cost per pax (excl. Pensions) arising from different staff types



Source: Taylor Airey analysis, Heathrow Airport Limited Regulatory Accounts (2014-2020)

People cost efficiencies from Security Transformation

The introduction of a new screening technology to meet regulatory requirements by June 2024 gives HAL the opportunity to re-engineer security processes and deliver workforce efficiencies.

In the RBP Update 1, HAL clarifies that this opportunity is only realisable if the £1.7bn enhancement capex is allowed as part of the updated £4.2bn capex plan.

- It states that the lower capital plan only includes the regulated compliance element of the programme, involving the installation of new body scanning and CT screening equipment in terminals and campus as per the DfT mandated regulatory change which, on its own, would not deliver operating cost savings.
- It also states that the Security Transformation programme is not sufficiently mature to be able to develop robust benefit estimates and therefore specific operating cost savings have not been included as an overlay.

Table 2: Outturn of Optimal and Safety Only plans in future regulatory periods

	Optimal Plan	Safety Only Plan
Security	All passengers travelling through compliant security at all times, with all security lanes upgraded by end of H7, better service and lower operating costs.	All passengers travelling through compliant security at all times, but only 50% of security lanes available by end H7, increased queue times and worse service, same or worse operating costs.

Source: HAL RBP Update 1 – 5.3 Capital Plan Updates

Airline views:

- Airlines note that HAL has presented investment case slides showing an aspiration to move from ✂ passengers per hour (pph) per lane to ✂ per lane i.e. ✂ improvement in flow rate.
- It estimates this may deliver savings of £40m pa.

Sources:

Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7.1: Operating Costs – Section 7.1.7.3 Capital investment in H7

37. 2021.03.02 - Airline Community Presentation to CAA_RBP Feedback and ABP_Final

Security Transformation: Our view

We conclude that opex benefits can arise from improving security efficiency through people and process change, regardless of the level of capital investment in security. Benefits should be modelled directly in the People cost category rather than as capital substitution effects.

Comments on HAL's approach to modelling benefits:

1. **Maturity of HAL's analysis**

   It seems unrealistic for HAL to claim that their modelling of the benefits of the Security Transformation programme is not yet mature as it already has experience of early installations of the new technology in some terminal areas. As security staff costs represented between 40-45% of the staff cost base in Q6, benefits in this critical area would be expected to be modelled in detail, even at this stage of the business planning process.

2. **Dependency on capex**

   Experience from other airports as well as from HAL's past initiatives shows that benefits can be derived from operational process improvements which are independent of infrastructure or equipment change i.e. the way that staff are deployed and the tasks it does as well as the way the passengers are directed through the process. As the screening technology changes are mandated by regulation, operational processes will change regardless of the capital allowance.

   We therefore disagree with HAL's view that no efficiency improvements are possible without higher capital expenditure.

Our alternate view:

Rather than the airlines' approach of deriving an absolute figure per annum, benefits from security transformation will be volume related and it would be more accurate to treat them as an amended elasticity with respect to passengers for security staff FTE rather than an overlay.

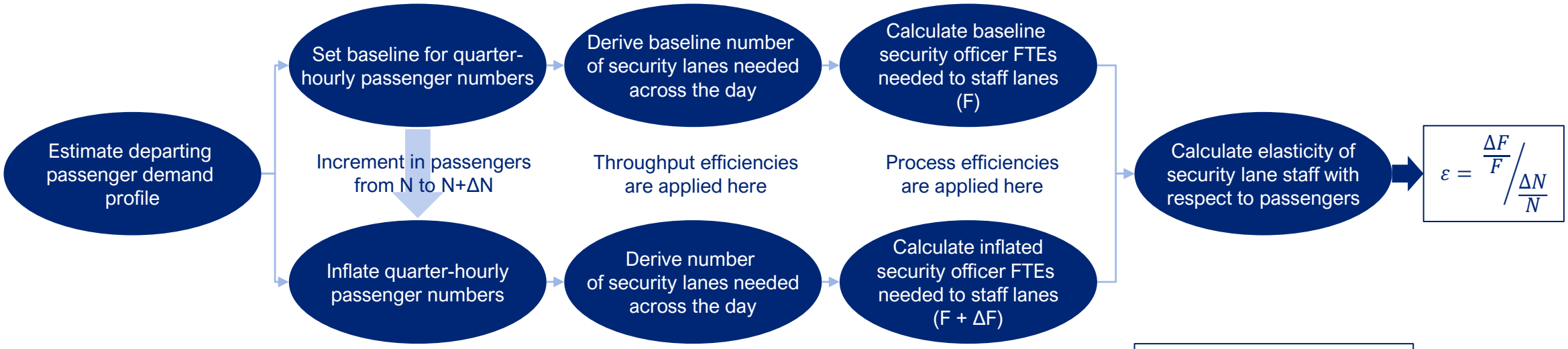
We have therefore undertaken detailed modelling to create a bottom-up validation of relevant elasticities to use for Security people costs.

In this way we have derived multiple elasticities to account for the step changes produced by the introduction of new technologies.

The assumptions, approach and outputs from this analysis is shown on the following pages.

Security: Establishing a model for elasticity

In order to estimate elasticities with respect to passengers for security staff, we have applied a simple queuing model to understand how the requirements for the security officer resources needed to staff screening lanes varies with passenger demand. This model, which has been validated against a range of scenarios at other airports, is also used to estimate the savings from improvements in passenger throughput and process efficiency.



The demand profile across the day is based on an average typical of Heathrow historically, derived from flight data, e.g. from Flightradar24

The demand profile is used to distribute Heathrow's passengers quarter- hourly across the day for different levels of annual demand, both observed historically and intermediate, theoretical levels created to model elasticity under different conditions

The number of security lanes needed to meet demand is calculated at quarter hour intervals from the demand profile and the lane throughput. The baseline throughput was set at ✂ passengers per lane per hour and increased in increments up to ✂ passengers per lane per hour to model efficiencies and test the effects on elasticity

The number of hours needed to staff the open lanes is calculated and translated into FTE numbers. Based on experience at other airports a baseline of ✂ staff per lane was used and decreased to a target level of ✂ staff per lane to estimate efficiencies and test the impact on elasticity.

Depending on throughputs and staffing levels assumed the derived elasticity for security lane staff with respect to passengers varied from **0.6 to 0.8**.

Security: Estimating staff costs

We have applied the model described above to calculate the relationship (elasticity) between passenger volume and the number of security FTEs required. We have overlaid this model with expected efficiencies in terms of passenger throughput and process improvement indicated by HAL and through comparison with stretch targets anticipated at other UK airports operating similar equipment and processes.

Assumptions and sources:

1. Security staff requirements comprise a variable part, associated with passenger and hand baggage screening, that depends on passenger volumes with elasticities derived as shown on the previous page, and a fixed part, e.g. for fixed posts, that is inelastic to passenger volumes.
2. HAL's future security processes will take advantage of the capabilities of the new technologies (body scanners, CT screening, etc) that are mandated in the same way that other airports operate or plan to operate.
3. HAL suggest that throughput will increase from ✂ passengers per hour per security lane to ✂ passengers per hour per lane: we assume that this change is phased from 2022 to 2026, that is an improvement of ✂ over five years or approximately ✂ per year.
4. Our experience of comparison with the aspirations of other airports suggests that process improvement initiatives can reduce the variable staff requirements for security lanes by ✂ (e.g. from ✂ to ✂ staff per lane) typically over five years: we assume this starts in 2023 and that is an annual improvement of ✂ per year.
5. In parallel, technology improvements and process efficiency will reduce the requirement for fixed staffing levels by 1% per year starting in 2023.
6. Historic staff numbers to 2018 are sourced from the Steer report on opex efficiency with 2019 figures being sourced from the PA-Nyras report commissioned by the LACC.
7. The fixed component of the staff cohort is estimated from staff classified as "campus" and "other" in the Steer report with the variable component of the staff cohort derived from the remaining staff, assigned to terminals in the Steer report.
8. Historical costs are derived from HAL's regulatory accounts.
9. Projected costs are estimated using the 2019 cost per security FTE of ✂ derived from the regulatory accounts and the PA-Nyras report, meaning that wage inflation and counteracting measures to reduced costs are not included (or cancel each other out).

Sources:

PA Consulting (Nyras) (2020) Operating Cost Report and Presentation Benchmarking Study

Steer, December 2019: Operating Cost

2021.03.02 - Airline Community Presentation to CAA_RBP Feedback and ABP_Final

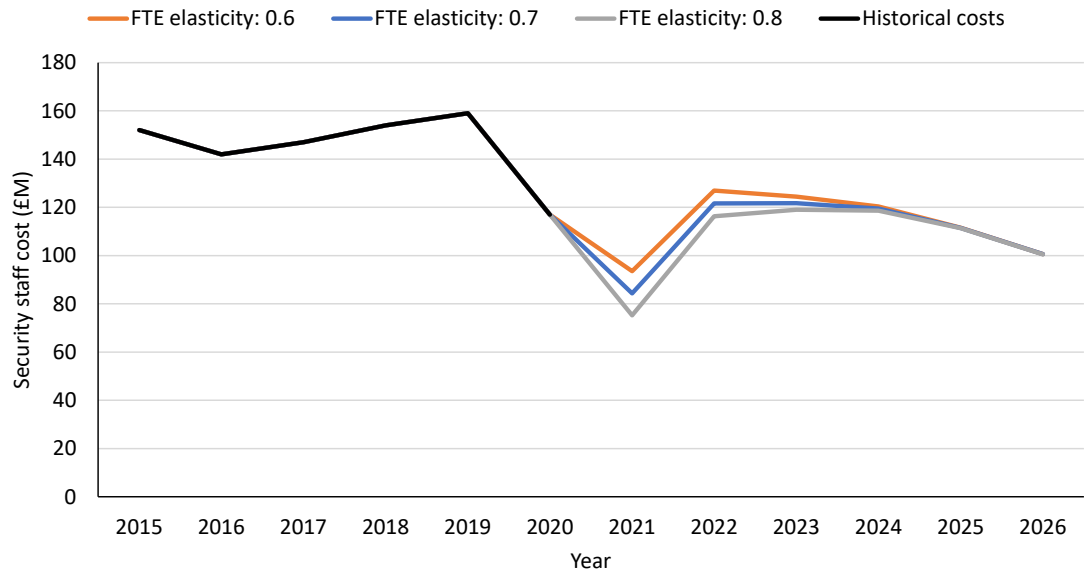
Security: Staff projections

The modelling indicates that the staff-passenger (FTE) elasticity is in the range 0.6 to 0.8 for the variable component of security staff, equating to an elasticity of 0.48 to 0.65 for all security staff. Using the CAA's median traffic forecasts, this results in projected staff numbers and costs as indicated in the figures below.

Projection of security staff numbers

Source: Taylor Airey analysis

Projection of security staff costs (nominal)



Source: Taylor Airey analysis

Estimating other staff costs: Approach

Along with security, the staff cost category is classified into operational, non-operational and pensions costs in the regulatory accounts. These historical costs have been used as the basis of future cost projections but because of the lack of information on staff numbers and roles, it has only been possible to undertake simple analysis based on costs alone.

Operational staff:

1. Operational costs are derived from HAL's regulatory accounts and used unadjusted.
2. Future staffing levels have been estimated using a cost elasticity of 0.4 compared to the 2019 baseline, which is our average elasticity estimate for categories where we do not have a specific elasticity estimate. We then separately estimate real wage effects (see Section H on input price inflation)
3. No other efficiency measures have been assumed.

Non-operational staff:

1. Costs associated with non-operational staff have been derived from HAL's regulatory accounts adjusted for the level of staff cost capitalisation, reported in the regulatory and statutory accounts.
2. Future staffing levels have been estimated using an elasticity of 0 given we do not expect these costs to vary with passenger numbers. We then separately estimate real wage effects.
3. No other efficiency measures have been assumed.

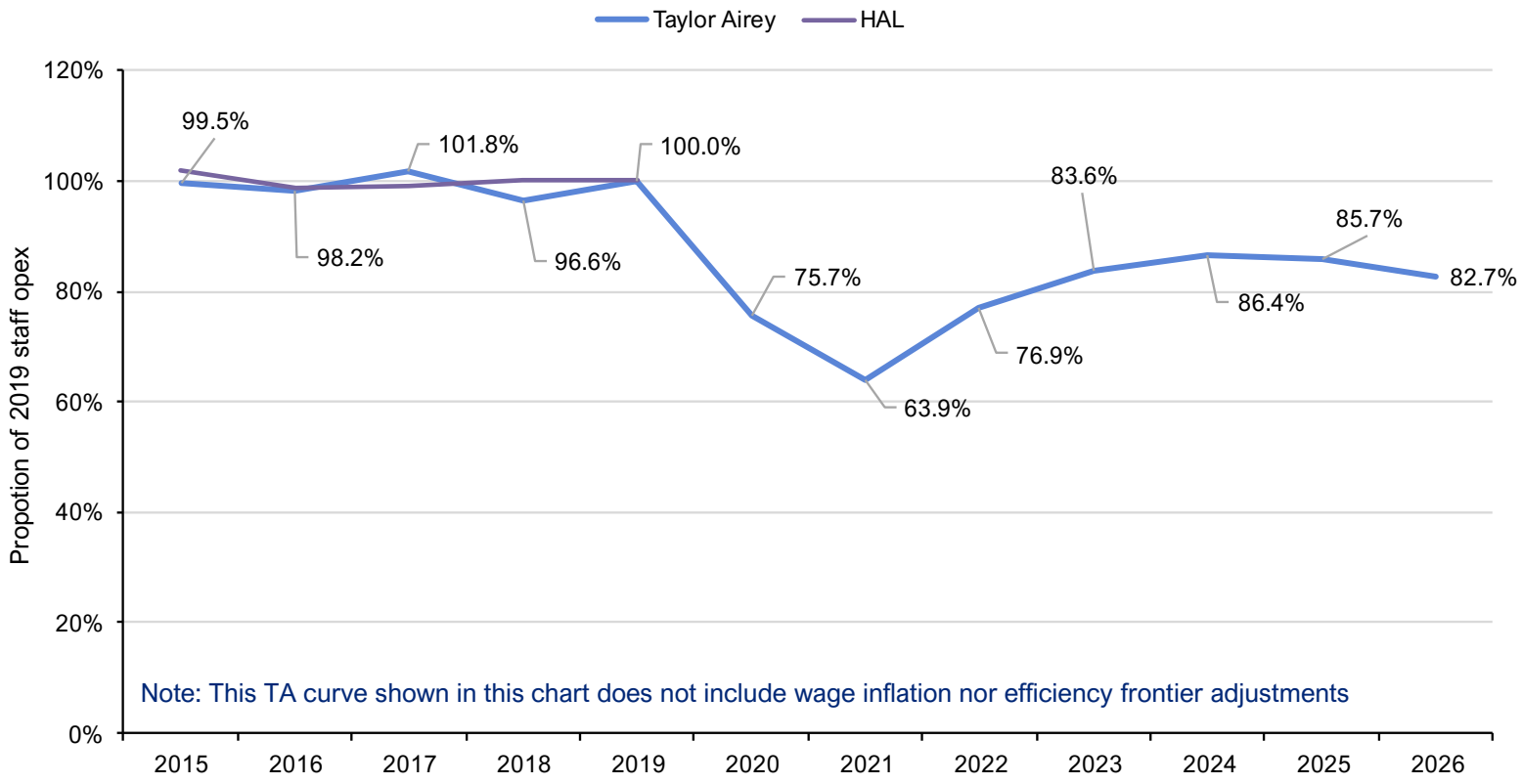
Pension costs:

1. Costs associated with non-operational staff have been derived from HAL's regulatory accounts adjusted for the level of staff cost capitalisation, reported in the regulatory and statutory accounts.
2. Future pension costs have been estimated using a cost elasticity of 0.4 compared to the 2019 baseline, which is our average elasticity estimate for categories where we do not have a specific elasticity estimate. We also assume pension costs grow in line with average wages.
3. No other efficiency measures have been assumed.

Estimating staff costs: Results

It is very difficult to reconcile our estimates of staff costs with those generated by HAL in its RBP because HAL appears to make various adjustments between regulatory and statutory accounts that are not transparent at individual cost category levels. To overcome this issue, the figure below compares our estimates of staff costs, historical through to projections in nominal terms referenced to the 2019 baseline. For comparison, HAL's projections from the RBP model (Update 1) are also shown normalised to 2019.

Projection of staff costs as a proportion of 2019 costs, nominal



Source: Taylor Airey analysis

Impact of Terminal closures - People

Table 4: Updated terminal opening dates for different passenger volume scenarios in Update 1

Updated Terminal Opening Dates	T4 Open For Red List Arrivals	T4 Open to all Arrivals
High (P90)	June 2021	June 2023
Mid (P50)	June 2021	June 2023
Low (P10)	June 2021	June 2025

Source: Heathrow

HAL has operated its infrastructure in various configurations since the start of the pandemic:

- Initially reducing to a two terminal, single runway operation to better align with demand.
- Then reopening Terminal 4 as a terminal for arrivals from 'red-list' countries – costs expected to be recovered.
- Limited breakdown of the Red List operation is provided (HAL assumes that ✂ of security staff and ✂ of Engineering staff cost are required for Red list operation).
- Insufficient detail of the recovery arrangements for the costs associated with using terminal 4 as a Red-list terminal are provided which obscures the 2021 figures.

In addition to T2 and T5, HAL's base assumptions for terminal usage in H7 are:

- Terminal 3 is fully operational throughout H7
- Terminal 4 opens as shown in the RBP table left

To assess the impact of operating with these consolidated facilities, HAL adjusts for area utilised using the metrics below, derived from 2018 average historical costs.

Cost category	Multiplier
Change in People costs	✂
Change in Operational costs	✂
Change in Utilities costs	✂

Sources:

Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7.1: Operating Costs

Heathrow Airport, RBP Update 1, June 2021 7. Additional evidence to support our Scenarios

Impact of Terminal closures – People: Our view

Efficiency:

HAL commissioned Frontier Economics to undertake analysis of the elasticity of operating costs to various cost drivers at the airport.[1]

As Frontier Economics could find no relationship between HAL's historical people costs and their drivers, we question whether these multipliers could be considered appropriate or efficient.

Our forecasting approach broadly follows Heathrow's, but we will consider further ways to validate their assumptions at a later stage.

The inclusion of T4 use as a Red list terminal makes it unclear in HAL's model whether the costs returned post-opening match the savings made whilst the terminal was closed.

- e.g. ✂

Reopening of T4 for all arrivals:

We agree with HAL's approach of ramping up costs in the 3 months preceding full reopening of T4 as staff are retrained and re-familiarised.

However, the proposed trajectory (✂) and the approach of applying a space driver to people costs is likely to be overly cautious as it means that 100% of T4 people cost returns on the day that T4 is reopened, regardless of the passenger volume served.

Proportion of T4 staff savings possible due to terminal closure - 2023

Source: Taylor Airey analysis

We use HAL's proposed multiplier of ✂, and accept that certain non-staff costs will need to be ramped up 3 months prior to the full reopening of the terminal. However, we consider staffing can be ramped up at a slower trajectory, as per the chart above.

Our more conservative assumptions equates to a further potential saving of £1m in 2023 over that modelled by HAL in their forecasts.

Commentary on the impact of terminal closures on Operational Costs and Utilities costs are included in our later discussions of those costs categories

1. Frontier Economics (2019) Developing opex and commercial revenue elasticities for H7

Cost of Change

We conclude that the savings proposed by HAL arising from the Cost of Change programme are applied to future opex forecasts as agreed between the airport and airlines.

HAL states that it has made ✂ (nominal) permanent savings (at 2019 passenger levels) through the Cost of Change programme

- HAL guarantees to deliver a saving per annum related to the cost of change that is added to the RAB. This saving will be applied to each year until the cost of change is fully depreciated.

Airlines' views:

- HAL has identified more savings in the RBP which have not been included, therefore additional cost savings should be included.
- ✂ of HAL's stated permanent saving relates to Cost of Change, which as per the business case only began to achieve savings in late Q4 2020.

Our view:

- ✂ **savings per annum should be applied as an overlay on H7 forecasts.**
- Note: We understand that this programme relates to the impacts and benefits from making changes to staff legacy terms and conditions and is separate from, and additional to the benefits arising from the organisational changes referred to earlier.

Sources:

Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7.1: Operating Costs

2021.03.02 - Airline Community Presentation to CAA_RBP Feedback and ABP_Final

Magenta

HAL states that, *"Magenta is the biggest transformational change programme ever undertaken by Heathrow support services. We are implementing a modern system with straightforward, intuitive processes that allows our support functions to operate efficiently, to provide insights and to add value to decision makers. The scope of the programme will include, our core finance process areas, the people lifecycle, asset management, business intelligence".*

However, it also states that Magenta is not included in the Capital Investment chapter as the capital expenditure is incurred prior to the start of H7:

- The Gateway 3 Business Case was approved by the airline community at the August 2020 Capital Plan Board. However, the benefits associated with Magenta reduce capitalisable costs and are therefore not included in the operating cost forecast.
- Magenta does provide an opportunity to reduce overheads included in the Leadership and Logistics %.

In the RBP Update, HAL reiterates that:

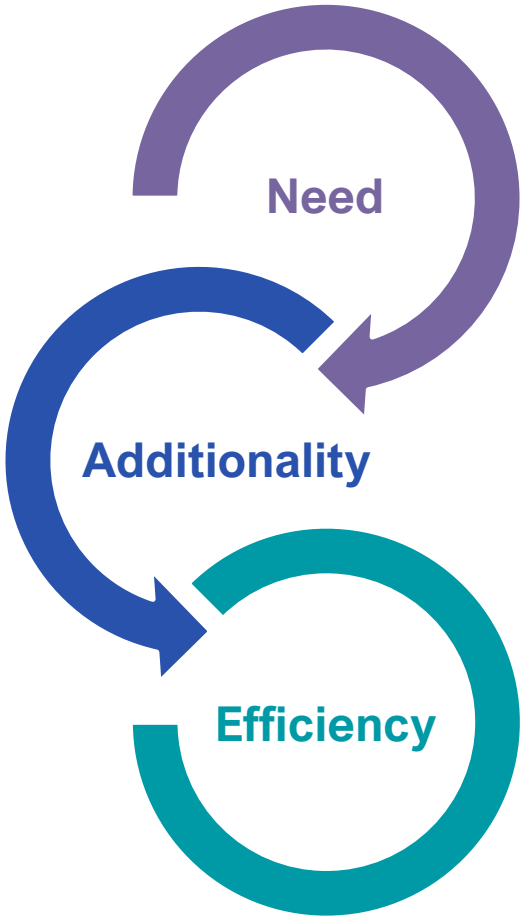
> *"…the incremental savings associated with the Magenta G3 business case are not related to operating costs"* and state that, *"There has been further engagement and clarification on this matter with the Airline Community at the CPB where we have explained how the identified benefits relate to capital process and cashflow efficiencies"*

Our view:

Elsewhere in the RBP, HAL states that there are benefits to numbers of staff employed in back-office functions but that these have already been realised in the organisational change actions taken in 2020 and 2021. These savings should be used as a basis for H7 forecasts as discussed earlier even if, as HAL states, no further savings are possible from the Magenta programme.

Source: Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7.1: Operating Costs – Section 7.1.5.1 Transforming our Support Services Efficiency

Enhanced service cost overlay: Summary



For the "Full RAB Adjustment case", HAL asserts that an additional ✂ (2018 RPI prices) per annum is required as an enhanced service cost overlay (ESO) to deliver a "*I feel cared for and supported*" consumer outcome. This ✂ comprises:

1. £✂ for the 39% of passengers requiring support who choose not to use "*our dedicated assistance service*";
2. an additional £✂ maintenance to ensure resilience of passenger sensitive equipment (PSE) that has suffered under investment and cannot be replaced under the current capital programme;
3. £✂ for digital services bridging a customer services gap; and
4. £✂ to support the roll-out of new automated, touchless parts of the passenger journey.

With the exception of (2) on resilience, none of the above elements of the enhanced service overlay would appear to be additional to business as usual activities. Of the £✂ allocated to resilience, part of this may be justified for old, difficult to maintain equipment but there is a risk of overlap with standard maintenance and a potential inflation as equipment in, for example, in Terminal 2, is not likely to be at end of life or difficult to maintain.

As the enhanced service overlay appears to cover or overlap with business as usual activities accounted for elsewhere, specifically standard maintenance and support to passengers with reduced mobility (PRM), we propose to apply a reduced enhanced service cost overlay of **£7m in 2022 adjusted for efficiencies going forward**. The rationale for this approach is described on the following page.

Enhanced service cost overlay: rationale

The ✂ for **passengers requiring support** (PRS) is claimed additional to support to Passengers with Restricted Mobility (PRM), which is treated separately, but is to support vulnerable consumers (39%) who choose not to use "*our dedicated assistance service*". As these passengers choose not to use the PRM service or are not directed to the PRM service by HAL, this is therefore essentially a service quality initiative. More generally, there appears little evidence that there is a service quality issue at Heathrow: indeed service quality scores are reported as high. We have, therefore, not including this component of the ESO.

HAL claims a customer **digital service** gap regarding customer queries through personal digital devices and has applied an ✂ ESO to address this. However, as many other premium airports are providing such digital services as business-as-usual, we have not included this in the ESO.

HAL has allocated ✂ to support **touchless/ automated journeys**. This again appears to be business as usual and automation would imply some efficiency savings. We have, therefore, not included this in the ESO.

The main part of HAL's ESO cost is to support **resilience** of passenger sensitive equipment (PSE) comprising items such as lifts, travelators, escalators, the T5 track transit system, stands and baggage reclaim. The argument for this being part of the ESO is that it is needed to offset previous capital under-investment to extend the life of assets and maintain them to ensure that passengers have a predictable and reliable journey. HAL estimates that this would require an uplift of ✂ in maintenance spend (✂), which has been reduced to ✂ per annum as a stretch target.

The link between the increased maintenance spend and reduced risk of low availability and reliability is not clear. Furthermore, it is not clear the extent to which assets are nearing the end of their life and would, therefore, need enhanced maintenance. For example, assets in Terminal 2 are only a few years old and would not be expected to be subject to ESO. Similarly, assets in Terminal 5 are of the order of 13 years old and, assuming a 20-year life, would also not be subject to ESO. There are also likely to be similar recently replaced or refurbished assets in the other terminals. Therefore, we have included the resilience component of ESO in our assessment but at a reduced rate of £7m per annum to maintain service quality standards, subject to normal efficiency savings throughout the H7 period.

People: TA Proposals - nominal

People costs: *Security staff, operational staff, non-operational staff, pension costs (HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	379.0	379.0	379.0	379.0	379.0
Baseline adjustments, £m (%)	-63.9 (-17%)	-63.9 (-17%)	-63.9 (-17%)	-63.9 (-17%)	-63.9 (-17%)
Adjusted baseline, £m	315.1	315.1	315.1	315.1	315.1
Price increase, £m (%)	4.5 (1%)	12.9 (4%)	23.1 (7%)	34.7 (11%)	47.4 (15%)
Price adj. forecast, £m	319.5	328.0	338.1	349.8	362.4
Volume adjustment, £m (%)	-57.5 (-18%)	-37.0 (-11%)	-23.6 (-7%)	-16.8 (-5%)	-14.7 (-4%)
Volume adj. forecast, £m	262.0	291.0	314.5	332.9	347.7
Overlay, £m (%)	-15.3 (-6%)	-19.8 (-7%)	-25.5 (-8%)	-38.6 (-12%)	-50.5 (-15%)
Frontier shift efficiency, £m (%)	-2.5 (-1%)	-5.4 (-2%)	-8.6 (-3%)	-11.6 (-4%)	-14.6 (-5%)
Final forecast, £m	**244.3**	**265.8**	**280.4**	**282.8**	**282.7**
HAL forecast, £m	✂	✂	✂	✂	✂
Difference with TA, £m	✂	✂	✂	✂	✂

H7
✂

Source: Taylor Airey analysis

Section Three

Opex forecasts

D. Operational Costs (incl. Insurance)

Operational costs: Summary of HAL's proposals

Operational costs: *Policing, PRM costs, IT, NATS, etc.*

2018 RPI prices	2022	2023	2024	2025	2026
2019 start point	281.6	281.6	281.6	281.6	281.6
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

Operational costs: *Policing, PRM costs, IT, NATS, etc.*

Nominal	2022	2023	2024	2025	2026
2019 start point	308.7	316.6	326.1	335.9	346.0
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

- Efficiencies from Frontier Shift assumption:
  - 0.1% pa from 2022.
  - Total ✂ across H7.

- Terminal growth overlay due to continued closure of Terminal 4 to all arrivals until June 2023.

Operational costs (excluding insurance)

Approach

As well as Insurance, the category Operational Costs also includes: Retail Costs, NATS Costs, Police Costs, Staff Catering, Bus Shuttle, and Other Operational Costs.

These subcategories are broken down in HAL's Regulatory Accounts but are not forecast individually in their RBP. We are therefore only able to consider the evolution of costs in these categories in Q6 / iH7 and any comments made by HAL in the text of the RBP. However, given the materiality of some of the subcategories in Operational Costs, we feel that this approach should be sufficient at this stage.

Comment on Elasticity based approach

Whilst HAL has forecast Operational Costs with a single elasticity of ✂ to passengers in the RBP, it has changed its approach for the RBP Update 1.

In the update it states that, *"Since the RBP, we have further reviewed the variability of operational costs with respect to passenger volumes. During 2020/21 it has not been possible to make the level of savings that would be suggested by using the elasticity of ✂ with respect to changes in passenger volumes. Costs such as IT, police and rent are largely fixed. Analysis of our 2019 operational costs suggests that around 50% of our operational costs are fixed in the medium term. As a result, we have reduced the passenger volume elasticity by 50% from ✂ to ✂ for operational costs".*

Our view: We agree that the larger components of this cost category are more likely to be driven by the specific contracts in place for each component rather than an overall volume elasticity.

- We would suggest that HAL could take a more granular approach and use the actual contract forecasts with an elasticity of zero, removing any volume effects.
- In the meantime we have applied our average elasticity of 0.4

Components of Operational Costs in 2019 (£m, 2018 RPI prices)

Sources used: Heathrow Airport RBP Update 1 Appendix 5 - Additional analysis to support Operating Cost modelling assumptions

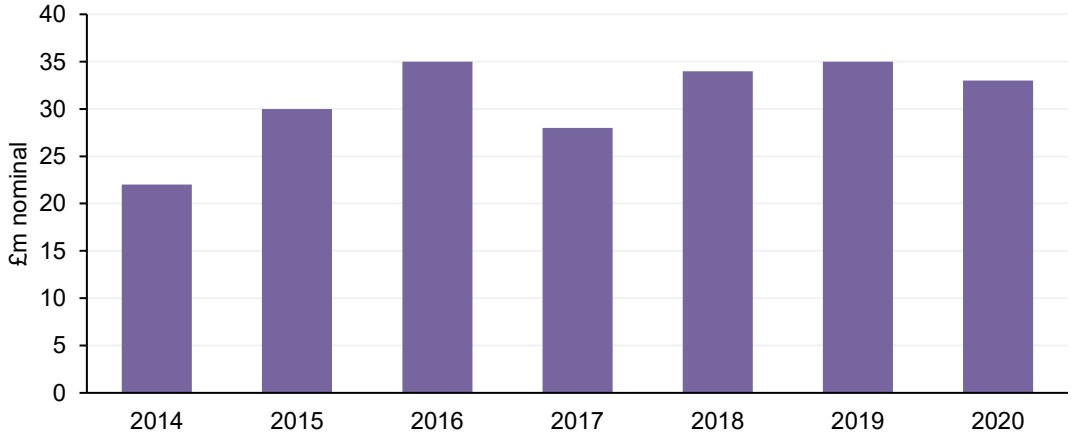
Operational Costs: Police and PRM costs

Police costs were responsible for around 13% of total Operational Costs in 2019 (£35m nominal). On analysing HAL's Q6 performance, Steer note that Police costs were relatively stable across the Q6 period with variations attributable to changes in contracting mechanisms and funding arrangements. It also notes that HAL *"…undertook a significant review on policing to drive efficiencies…".*

Finally, it observed that HAL Police costs per passenger were slightly higher than seen at Gatwick in each of the years 2014 -2018 (2018 RPI prices).

Our view: Based on the limited evidence we have on this sub-category, Police costs are not expected to be a materially significant issue for H7 forecasts at this stage.

Operational Costs: Police (£m, nominal)



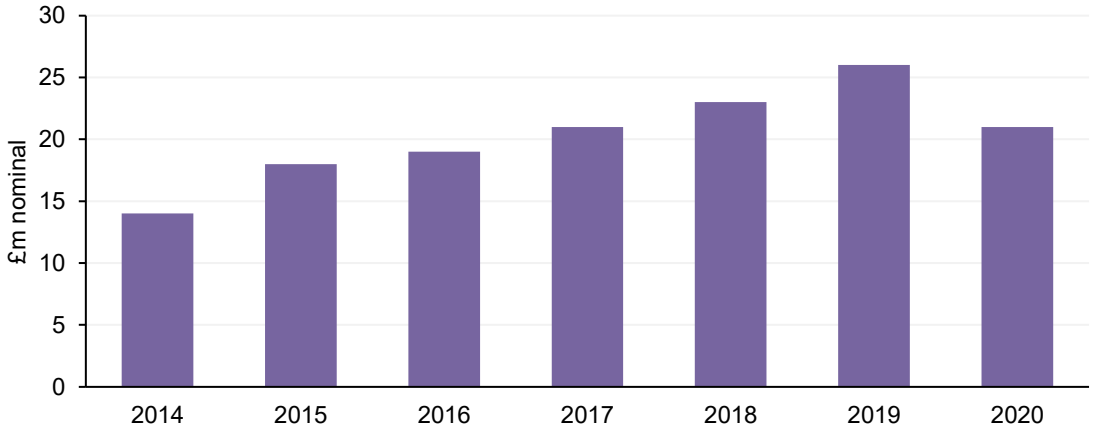
Source: HAL Regulatory Accounts, Steer, December 2019: Operating Cost Benchmarking Study

PRM costs were responsible for around 9% of total Operational Costs in 2019 (£26m nominal).

The variable nature of a significant proportion of this cost can be seen in the decline in expenditure from 2019 to 2020 in the chart below.

Our view: We understand that PRM provision is an operationally critical issue with the ability to impact passenger experience positively or negatively and is therefore the subject of regular discussion between HAL and its airline community. However, based on the limited evidence we have on this sub-category, PRM costs are not expected to be a materially significant issue for H7 forecasts at this stage.

Operational Costs: PRM (£m, nominal)



Source: HAL Regulatory Accounts, Steer, December 2019: Operating Cost Benchmarking Study

Operational Costs: NATS costs

NATS costs were responsible for around ✂ of total Operational Costs in 2018 (✂ 2018 RPI prices).

This sub-category is not reported at a disaggregated level in the Regulatory or Statutory accounts and a breakdown at this level is not provided in the RBP.

In their review of Q6 performance, Steer note that NATS costs have decreased ✂ from 2014 to 2018 (2018 RPI prices). It states that these savings have arisen from:

- Renegotiation of NATS contract in 2015 to a 10-year contract until March 2025.
- Reductions on leased assets as a result of HAL buying new assets and the changing phases of leased assets.
- The termination of electricity and rent/rate billing from HAL to NATS, which has subsequently been recharged by NATS back to HAL.

It further notes that HAL's ANS costs per ATM are higher than Gatwick in Q6 and that Gatwick have been able to reduce their unit costs at a faster rate.

Our view: This is a significant area of operational costs which would warrant further investigation to determine the likely future evolution of NATS costs.

This would require further disclosure from HAL regarding the contract basis and consideration of an appropriate elasticity specifically for this sub-category (likely to be a relationship to movements).

Sources:
HAL Regulatory Accounts
Steer, December 2019: Operating Cost Benchmarking Study

Operational Costs: NATS (£m, nominal)

Source: Taylor Airey analysis of Steer 2018 RPI figures

Impact of Terminal closures – Operational Costs

HAL's approach:

To derive cost savings attributable from the closure of Terminal 4, HAL adjusts for area utilised using the metrics below which it has derived from 2018/19 average historical costs.

Cost category	Multiplier
Change in People costs	✂
Change in Operational costs	✂
Change in Utilities costs	✂

To derive the multiplier for the category Operational costs, it extracts the elements of this category which it considers are variable and related to terminal usage as follows:

- PRMs;
- Commercial expenditure;
- Passenger ambassadors; and,
- Inter-Terminal Operations.

Together these categories represented around ✂ of the total Operational Cost in 2018 and 2019.

Our view:

The principle that only part of this category will relate to terminal operations and is therefore relevant to Terminal 4 closure is agreed.

We feel that further clarification could be sought on some of the attribution of the different categories. For example, we may question whether there was an opportunity to negotiate a temporary reduction in Police costs arising from the reduced terminal utilisation. However the overall difference that including or excluding specific sub-categories in this analysis would not be expected to be material in the overall opex forecast.

Source: Heathrow Airport RBP Update 1 Appendix 5 - Additional analysis to support Operating Cost modelling assumptions

Operational costs: TA Proposals - nominal

Operational costs: *Policing, PRM costs, IT, NATS, etc. (HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	288.8	288.8	288.8	288.8	288.8
Baseline adjustments, £m (%)	-7.6 (-3%)	-7.6 (-3%)	-7.6 (-3%)	-7.6 (-3%)	-7.6 (-3%)
Adjusted baseline, £m	281.3	281.3	281.3	281.3	281.3
Price increase, £m (%)	11.9 (4%)	17.5 (6%)	23.2 (8%)	29.3 (10%)	35.5 (13%)
Price adj. forecast, £m	293.2	298.7	304.5	310.6	316.8
Volume adjustment, £m (%)	-57.1 (-19%)	-36.5 (-12%)	-23.0 (-8%)	-16.2 (-5%)	-13.9 (-4%)
Volume adj. forecast, £m	236.1	262.2	281.5	294.4	302.9
Overlay, £m (%)	-11.2 (-5%)	-4.2 (-2%)	0.0 (0%)	0.0 (0%)	0.0 (0%)
Frontier shift efficiency, £m (%)	-2.2 (-1%)	-5.1 (-2%)	-8.4 (-3%)	-11.6 (-4%)	-14.8 (-5%)
Final forecast, £m	**222.7**	**252.9**	**273.2**	**282.8**	**288.1**
HAL forecast, £m	✂	✂	✂	✂	✂
Difference with TA, £m	✂	✂	✂	✂	✂

H7
✂

Source: Taylor Airey analysis

Insurance costs: Summary of HAL's proposals

Insurance costs:

2018 RPI prices	2022	2023	2024	2025	2026
2019 start point	✂	✂	✂	✂	✂
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

Insurance costs:

Nominal	2022	2023	2024	2025	2026
2019 start point	✂	✂	✂	✂	✂
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

Insurance

HAL does not use an elasticity based approach to forecast future insurance.

However, it proposes that insurance costs will increase by ✂ pa due to increasing premiums. HAL states this is conservative based on market conditions. Their evidence for this is:

- Recent quarterly actual data on changes in insurance costs in various categories from Marsh Global Analytics.
- HAL's own commentary on insurance market performance, aviation sector performance, COVID-19 impacts on insurance markets, and future insurance market performance.

The RBP Update states that the renewal process for 2021 has been completed and insurance costs are forecast to be ✂ (2018 RPI prices) in 2021 - a reduction of ✂ (2018 RPI prices) compared with the RBP. Despite this, it maintains that ✂ pa increase remains appropriate.

In the modelling, it further applies inflation effects and a ✂ pa additional cost overlay (not detailed).

Airlines state that they have not seen similar increases in their own premiums, despite operating in the same sector.

Sources:

Heathrow RBP 7.1.6.2 Specific Treatment of Cost Category Elements

Heathrow RBP Update 1 model (ROA, adjustments sheets)

HAL's inflation and overlay assumptions for Insurance presented in RBP Update 1

	HAL note			Change over 2019				
				2022	2023	2024	2025	2026
Price index	RPI per management judgement	%	RPI	6.9%	9.6%	12.9%	16.3%	19.8%
Driver	Analysis of Marsh Global Analytics. Details in Update 1 Section 5.4.6 - Other Modelling Updates - Insurance Costs.		Insurance	✂	✂	✂	✂	✂
Elasticity		Elasticity	✂					
Overlay	Update 1 Chapter 5.4 Operating Costs: 5.4.6	£m (2018 RPI)		✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL material

Insurance costs: Actual and HAL forecast (2018 RPI prices)

Source: Taylor Airey analysis of HAL material

Our view: We agree with HAL's approach that this cost category should not be forecast using an elasticity as insurance cost changes will not be volume related. However, the approach of combining market increases, inflation & other overlays appears overly conservative. Overleaf, we provide details of our proposals for the insurance forecast.

Marsh Global analytics. UK Composite Insurance Pricing Change

37. 2021.03.02 - Airline Community Presentation to CAA_RBP Feedback and ABP_Final

Insurance: TA Proposals - nominal

Insurance costs *(HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026	H7
Baseline, £m	✂	✂	✂	✂	✂	
Baseline adjustments, £m (%)	✂	✂	✂	✂	✂	
Adjusted baseline, £m	✂	✂	✂	✂	✂	
Price increase, £m (%)	✂	✂	✂	✂	✂	
Price adj. forecast, £m	✂	✂	✂	✂	✂	
Volume adjustment, £m (%)	✂	✂	✂	✂	✂	
Volume adj. forecast, £m	✂	✂	✂	✂	✂	
Overlay, £m (%)	✂	✂	✂	✂	✂	
Frontier shift efficiency, £m (%)	✂	✂	✂	✂	✂	
Final forecast, £m	✂	✂	✂	✂	✂	
HAL forecast, £m	✂	✂	✂	✂	✂	
Difference with TA, £m	✂	✂	✂	✂	✂	✂

Source: Taylor Airey analysis

We do not make any adjustments to the baseline and instead, assume insurance will grow by 5% per annum in nominal terms. We also apply our frontier shift assumption as we conclude that Heathrow should be given a management challenge to better these forecasts.

Section Three

Opex forecasts

E. Facilities and Maintenance

Facilities & Maintenance: HAL's proposals

Facilities and maintenance:

2018 RPI prices	2022	2023	2024	2025	2026
2019 start point	169.3	169.3	169.3	169.3	169.3
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

Facilities and maintenance:

Nominal	2022	2023	2024	2025	2026
2019 start point	185.5	190.3	196.0	201.9	208.0
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

- Efficiencies from Frontier Shift assumption:
  - 0.1% pa from 2022
  - Total ✂ across H7

Facilities and Maintenance costs

Facilities and Maintenance costs split down into three main sub-categories of costs:

- Maintenance;
- Baggage; and,
- Cleaning

The only sub-category for which any breakdown is available is Cleaning, where actuals are reported in the Regulatory Accounts. Further detail on the build up of Maintenance cost in particular would provide scope for a fuller analysis.

Components of Facilities and Maintenance Costs (£m, 2018 RPI prices)

Source: Heathrow Airport RBP Update 1 Appendix 5 - Additional analysis to support Operating Cost modelling assumptions

Contract costs (incl. Baggage Contract)

HAL should be challenged to deliver further savings from their procurement strategy beyond the Baggage renegotiation as well as retaining some of the short term benefits from contract renegotiations in 2020 and 2021 into the H7 period.

HAL highlights a business-wide procurement strategy to rationalise their supply chain and achieve greater value from having fewer suppliers with larger strategic partnerships.

- ✂ (2019 prices) pa savings arise from renegotiation of baggage operations and maintenance contract.

HAL further states that the majority of the immediate reductions in contract costs post-COVID are temporary or volume driven as it derives from:

- government job retention schemes;
- re-sizing of the supply chain;
- revisions to the scope of services; and
- alterations to commercial terms or models.

Airlines' views:

- HAL has identified more savings in the RBP which have not been included, therefore additional cost savings should be included.
- ✂ per annum, as stated by HAL should be included as additional savings.

Our view

✂ savings per annum should be applied as an overlay on H7 forecasts resulting from the baggage contract in the same way as HAL has forecast.

As these savings arise form a business-wide supply chain initiative, there would also be expected to be the potential for further long-term savings from similar renegotiations in other areas, such as vehicle fleet management, cleaning, etc. This could also be included for other large contracts, such as ANS and police in the longer term but probably outside the scope of H7.

We would expect that some of the contract savings from the immediate post-COVID response to managing the supply chain will be sustainable over the longer terms. HAL should therefore continue to realise these benefits across the H7 period.

These savings should be incorporated into the overarching frontier shift.

Sources:

Contract costs Heathrow Airport Limited (2021) Revised Business Plan Section 7.1.5.4

2021.03.02 - Airline Community Presentation to CAA_RBP Feedback and ABP_Final

Facilities and Maintenance: Cleaning costs

Cleaning costs were responsible for around 19% of total Facilities and Maintenance Costs in 2019 (£32m 2018 RPI prices).

In their analysis of HAL Q6 performance, Steer noted that cleaning costs (in 2018 RPI prices) have remained relatively stable over the Q6 period.

It also derived a cost per terminal m^2 of between ✂.

Our view:

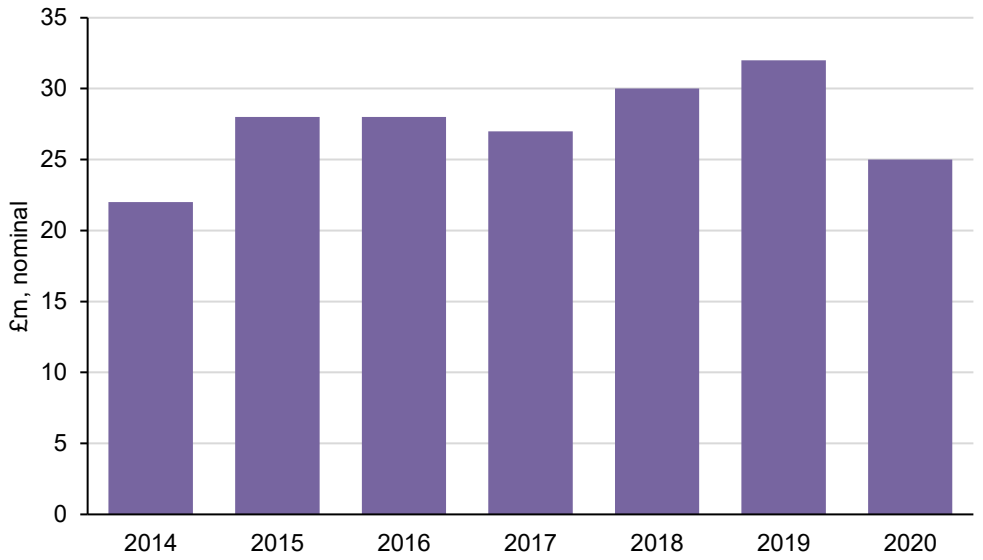
We note that there has been a reduction seen in cleaning costs of £7m from 2019 to 2020 which the Regulatory Accounts note is due to terminal consolidation and renegotiation with suppliers.

However, the COVID-19 overlay (see next slide) partly pays for a higher cleaning standard, which should lead downward pressure on costs in H7.

The challenge for this category going forwards will be to closely align the level of expenditure with three factors:

- Increases in passenger volumes in future years,
- The terminal reopening and utilisation plan,
- New or changing expectations for public health standards.

Facilities and Maintenance: Cleaning (£m, nominal)



Source: HAL Regulatory Accounts, Steer, December 2019: Operating Cost Benchmarking Study

Sources:
HAL Regulatory Accounts
Steer, December 2019: Operating Cost Benchmarking Study

Covid overlay

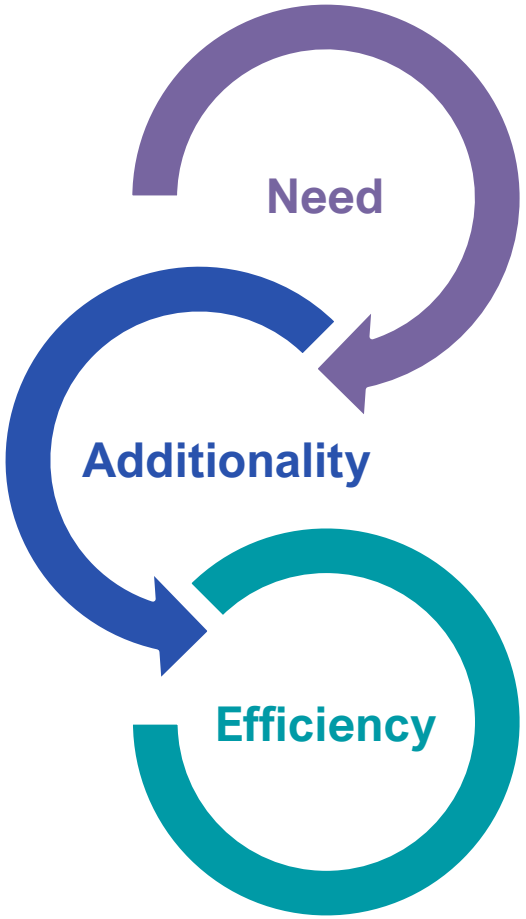


Table 6: Covid-19 Cost Overlay (£m, 2018p)

(£m, 2018p)	2022	2023	2024	2025	2026	H7 Total

There have clearly been costs incurred in the immediate pandemic response in 2020/21 which are unprecedented and could not be expected to be included in historical short run elasticities. However there is not a compelling case presented to evidence why such effects are expected to continue throughout the H7 period at a constant level (✂ pa, 2018 RPI prices) without any mitigation.

Due to a lack of transparency of the data it is difficult to determine whether the cost of public health responses may duplicate items that would have already been accounted for in facilities, cleaning and maintenance

Given the unique characteristics of HAL's business and its operational responses it is difficult to benchmark what an efficient cost might look like. However 2020 actual costs would be expected to be an unrealistically high estimate for the H7 years as:

- The immediacy of the responses required may not have allowed time for best value solutions to be sourced
- The supplier base for certain items may have been limited and competing demand in the market high (for example for hand sanitiser, wipes, PPE etc) in the early stages of the pandemic response
- No mitigations had yet been developed
- Costs incurred in 2020 arose in response to guidelines in force at that time. These are unlikely to be the same in the later years of the H7 period

Therefore, we propose using an overlay which tapers from ✂ (2018 RPI prices) in 2022 to 0 by 2026

Facilities & Maintenance: TA Proposals - nominal

Facilities and Maintenance costs *(HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026	H7
Baseline, £m	173.6	173.6	173.6	173.6	173.6	
Baseline adjustments, £m (%)	0.9 (1%)	0.9 (1%)	0.9 (1%)	0.9 (1%)	0.9 (1%)	
Adjusted baseline, £m	174.5	174.5	174.5	174.5	174.5	
Price increase, £m (%)	8.9 (5%)	13.1 (8%)	17.8 (10%)	23.0 (13%)	28.6 (16%)	
Price adj. forecast, £m	183.4	187.6	192.3	197.5	203.0	
Volume adjustment, £m (%)	-35.7 (-19%)	-22.9 (-12%)	-14.5 (-8%)	-10.3 (-5%)	-8.9 (-4%)	
Volume adj. forecast, £m	147.7	164.6	177.8	187.2	194.1	
Overlay, £m (%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	
Frontier shift efficiency, £m (%)	-1.5 (-1%)	-3.3 (-2%)	-5.3 (-3%)	-7.4 (-4%)	-9.5 (-5%)	
Final forecast, £m	**146.2**	**161.4**	**172.5**	**179.8**	**184.6**	
HAL forecast, £m	✂	✂	✂	✂	✂	
Difference with TA, £m	✂	✂	✂	✂	✂	✂

Source: Taylor Airey analysis

Section Three

Opex forecasts

F. Rates, Utilities and Distribution Contract

Rates costs: Summary of HAL's proposals

Rates:

2018 RPI prices	2022	2023	2024	2025	2026
2019 start point	114.6	114.6	114.6	114.6	114.6
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

- No volume adjustments made i.e. rates are not forecast using elasticities.
- No efficiencies are applied from a Frontier Shift assumption.

Rates:

Nominal	2022	2023	2024	2025	2026
2019 start point	125.6	128.9	132.7	136.7	140.8
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

- No terminal growth overlay is assumed i.e. no saving in Rates costs as a result of T4 closure.

Business Rates

HAL proposed approach: HAL states that it has very limited control of business rates and propose to make Rates an ORC in H7, ensuring 100% sharing immediately, any savings (or liabilities) with consumers.

- HAL states that it is inappropriate that it should benefit from windfall gains from reductions in rates. In 2020, it received ✂ from the Airport and Ground Operations Support Scheme (AGOSS) and is not expecting to receive any further support in 2021.
- It argues that, through the same logic, it should not bear the impact of any policy shift in the opposite direction.
- HAL further states that treating rates as an ORC will provide airlines with a higher degree of transparency over measures to reduce business rate costs even as government policy may shift.

Our view: The regulatory treatment of Rates is a matter of regulatory design that is beyond the scope of this study.

We agree with the principle of excluding Rates from the elasticity-based modelling approach.

At this stage, we have retained HAL's forecasts for Rates, but we index this with CPI rather than RPI, given the Government's announcement in the Autumn Budget 2017 that future **adjustments to business rates will be based on CPI rather than RPI**.[2] This results in the differences for Rates costs.

We expect HAL to indicate in its next update to the RBP (the RBP Update 2), whether it anticipates receiving further relief to business rates during the H7 period.

1. Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7.1: Operating Costs

2. Ministry of Housing, Communities & Local Government (2020) Business Rates Information Letter (1/2020): Rate Reliefs and Provisional 2020-21 Business Rates Multipliers

Rates: TA Proposals - nominal

Business Rates *(HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026	H7
Baseline, £m	117.6	117.6	117.6	117.6	117.6	
Baseline adjustments, £m (%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	
Adjusted baseline, £m	117.6	117.6	117.6	117.6	117.6	
Price increase, £m (%)	5.0 (4%)	7.3 (6%)	9.7 (8%)	12.2 (10%)	14.8 (13%)	
Price adj. forecast, £m	122.5	124.9	127.3	129.8	132.4	
Volume adjustment, £m (%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	
Volume adj. forecast, £m	122.5	124.9	127.3	129.8	132.4	
Overlay, £m (%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	
Frontier shift efficiency, £m (%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	
Final forecast, £m	**122.5**	**124.9**	**127.3**	**129.8**	**132.4**	
HAL forecast, £m	✂	✂	✂	✂	✂	
Difference with TA, £m	✂	✂	✂	✂	✂	✂

Source: Taylor Airey analysis

Utilities costs: Summary of HAL's proposals

Utilities costs:

2018 RPI prices	2022	2023	2024	2025	2026
2019 start point	65.5	65.5	65.5	65.5	65.5
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

- Efficiencies from Frontier Shift assumption:
  - 0.1% pa from 2022
  - Total ✂ across H7

Utilities costs:

Nominal	2022	2023	2024	2025	2026
2019 start point	71.8	73.6	75.8	78.1	80.4
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

- A terminal growth overlay is assumed:
  - A multiplier of ✂ of terminal space is applied based on historical actual cost from 2019.

Utilities costs – Volume effects

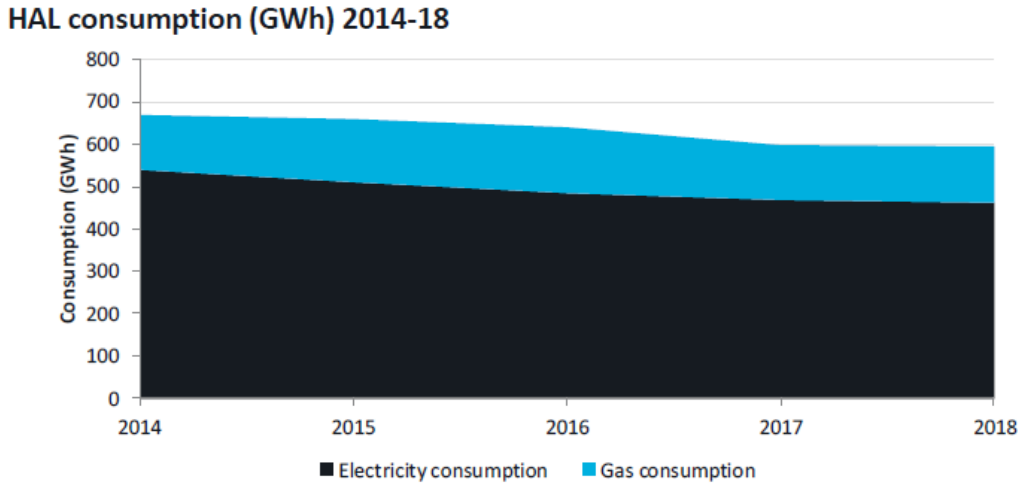
HAL approach:

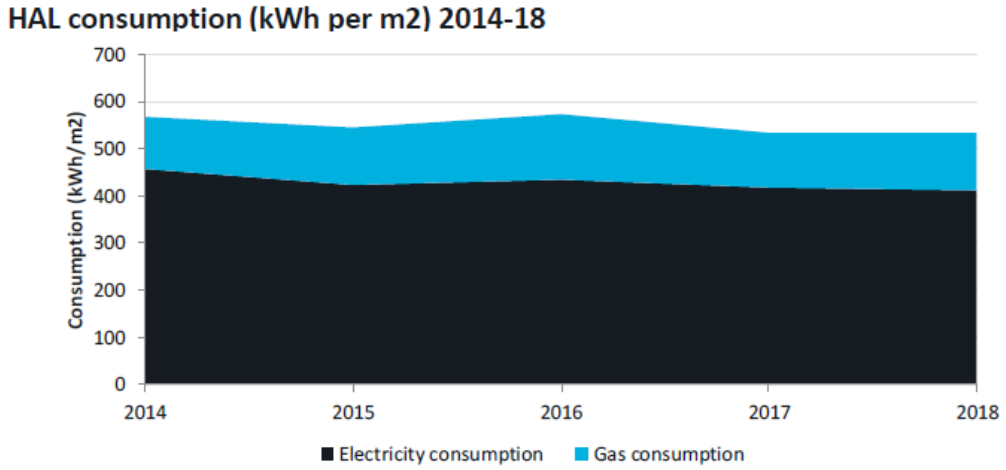
We have considered the issue of utilities usage in light of HAL's claim that their 2019 operation represented a business at the frontier of efficiency. Material presented by Steer in their 2019 operating cost analysis certainly seems on face value to show a decrease in electricity usage. Steer state that:

- Electricity consumption has decreased from 538.9 GWh in 2014 to 460.4 GWh in 2018, representing a -15% decrease.
- However, Gas consumption has increased slightly by +4% across the same time period, from 129.6 GWh to 134.4 GWh.

However, it should be noted that the usage in Q6 was significantly influenced by the closure of T1 for passenger operations in 2015/16.

Our view: further improvements to utilities usage should be possible through H7 through a focus on energy demand management projects (delivered through a combination of capex and process improvement).





Source: Steer, December 2019 Operating Cost Benchmarking Study

Note: Commentary on the price effects which are most appropriate to Utilities costs are included in our discussion of Price Inflation as an overarching issue

Impact of Terminal closures – Utilities

TAYLOR | AIREY

HAL's approach:

As stated above, to derive cost savings attributable from the closure of Terminal 4, HAL adjusts for area utilised using the metrics below which it has derived from 2018/19 average historical costs.

Cost category	Multiplier
Change in People costs	✂
Change in Operational costs	✂
Change in Utilities costs	✂

Our views

In Steer's more detailed analysis of Q6 costs, we note that it derives a value of around ✂ usage per m^2 of terminal space. Using this figure, HAL's assumed cost of ✂ for utilities therefore implies a unit cost of approximately ✂ which does not seem unreasonable.

The approach of assuming that heating, lighting and use of operational systems such as baggage handling will increase utilities usage in the ramp up to and following T4 reopening also appears reasonable.

We therefore propose to retain HAL's approach for dealing with this overlay.

Sources:

Steer, December 2019 Operating Cost Benchmarking Study - FINAL REPORT

Heathrow Airport RBP Update 1 Appendix 5 - Additional analysis to support Operating Cost modelling assumptions

Utilities: TA Proposals - nominal

Utilities costs *(HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026	H7
Baseline, £m	67.1	67.1	67.1	67.1	67.1	
Baseline adjustments, £m (%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	
Adjusted baseline, £m	67.1	67.1	67.1	67.1	67.1	
Price increase, £m (%)	5.3 (8%)	6.8 (10%)	8.1 (12%)	10.1 (15%)	14.0 (21%)	
Price adj. forecast, £m	72.5	73.9	75.2	77.2	81.1	
Volume adjustment, £m (%)	-14.1 (-19%)	-9.0 (-12%)	-5.7 (-8%)	-4.0 (-5%)	-3.6 (-4%)	
Volume adj. forecast, £m	58.4	64.9	69.5	73.2	77.6	
Overlay, £m (%)	-3.5 (-6%)	-1.3 (-2%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	
Frontier shift efficiency, £m (%)	-0.5 (-1%)	-1.3 (-2%)	-2.1 (-3%)	-2.9 (-4%)	-3.8 (-5%)	
Final forecast, £m	**54.3**	**62.3**	**67.5**	**70.3**	**73.8**	
HAL forecast, £m	✂	✂	✂	✂	✂	
Difference with TA, £m	✂	✂	✂	✂	✂	✂

Source: Taylor Airey analysis

The differences between our forecast and the HAL forecast primarily relate to differing frontier shift assumptions, where we assume a 1% efficiency per annum, whereas HAL assume a 0.1% efficiency per annum.

Distribution contract costs: HAL's proposals

Distribution contract costs:

2018 RPI prices	2022	2023	2024	2025	2026
2019 start point	✂	✂	✂	✂	✂
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

Distribution contract costs:

Nominal	2022	2023	2024	2025	2026
2019 start point	✂	✂	✂	✂	✂
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

No volume adjustments made i.e. Distribution contract costs are not forecast using elasticities.

No efficiencies are applied from a Frontier Shift assumption.

No terminal growth overlay is assumed i.e. no saving in Distribution contract costs as a result of T4 closure.

Electricity Distribution Fee

HAL basis of forecasts - The electricity distribution fee is a negotiated price between HAL and the UK Power Networks (UKPN) to gain access to the power supply networks through which it receives its electricity. The contract was renewed in 2016 and forms the basis for the forecast for H7.

Our view:

Given the materiality of other issues, we have not prioritised review of this cost category at this stage.

Future consideration would be limited to a cross-check to determine that the basis of the contract mechanism has been accurately reflected in the model.

At this stage, we therefore use HAL's forecasts for Electricity Distribution Fee.

Distribution Contract: *(HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026	H7
Taylor Airey forecast, £m	✂	✂	✂	✂	✂	
HAL forecast, £m	✂	✂	✂	✂	✂	
Difference with TA, £m	0.0	0.0	0.0	0.0	0.0	**0.0**

Source: Taylor Airey analysis

Source: Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7.1.6: Operating Costs Forecast Methodology

General expenses: HAL's proposals

General expenses:

2018 RPI prices	2022	2023	2024	2025	2026
2019 start point	129.1	129.1	129.1	129.1	129.1
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

General expenses:

Nominal	2022	2023	2024	2025	2026
2019 start point	141.5	145.2	149.5	154.0	158.6
Baseline adjustments, £m	✂	✂	✂	✂	✂
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Frontier shift, £m (%)	✂	✂	✂	✂	✂
Efficiency adjusted forecast, £m	✂	✂	✂	✂	✂
One-off impacts, £m	✂	✂	✂	✂	✂
Terminal growth overlays, £m	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: Taylor Airey analysis of HAL RBP model

Efficiencies from Frontier Shift assumption:

- 0.1% pa from 2022
- Total ✂ (RPI prices) across H7

No terminal growth overlay is assumed i.e. no saving in General Expenses as a result of T4 closure.

General Expenses

There is only limited detail provided in the Heathrow RBP and RBP Update about the constituent parts of the General Expenses category and their potential trajectory for the forecast H7 period.

However from a supporting spreadsheet[1] provided by Heathrow in relation to the Initial Business Plan (IBP), it would appear that this category covers three elements of costs:

- Consultancy and marketing costs (some of which are capitalised) – ✂[2]
- Other General Expenses – ✂[2]
- Intercompany costs – ✂[2]

The relative sizes of some of the components of these categories are illustrated in the chart opposite.

Our view: This is a significant cost category which contains elements which could be considered as 'discretionary' spend including marketing and professional consultancy costs. We note that during dialogue on H7 forecasting, Heathrow have noted that they are avoiding spend on new consultancy commissions and this is an area they note they have identified as 'non-essential' in their RBP discussion of actions taken in response to the pandemic.

We would expect that some of the short term cost restraint in these categories would be maintained in H7 as passenger volumes take time to recover – this should be captured as part of the Frontier Shift efficiency challenge discussed later.

We would also expect Heathrow to disaggregate and provide further detail on the breakdown of categories labelled "Other General Costs" and "Other General Expenses" as these are likely to be material in the context of H7 total opex.

Component parts and relative sizes of costs in the General Expenses Category

1. Heathrow spreadsheet "219 2020 Base data in detailed categories – raw data"
2. %s of 2019 forecast General Expenses total at the time of the IBP publication (✂)

General expenses: TA Proposals - nominal

General expenses *(HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026	H7
Baseline, £m	132.4	132.4	132.4	132.4	132.4	
Baseline adjustments, £m (%)	-7.6 (-6%)	-7.6 (-6%)	-7.6 (-6%)	-7.6 (-6%)	-7.6 (-6%)	
Adjusted baseline, £m	124.8	124.8	124.8	124.8	124.8	
Price increase, £m (%)	5.3 (4%)	7.7 (6%)	10.3 (8%)	13.0 (10%)	15.8 (13%)	
Price adj. forecast, £m	130.1	132.5	135.1	137.8	140.6	
Volume adjustment, £m (%)	-25.3 (-19%)	-16.2 (-12%)	-10.2 (-8%)	-7.2 (-5%)	-6.2 (-4%)	
Volume adj. forecast, £m	104.8	116.3	124.9	130.6	134.4	
Overlay, £m (%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	
Frontier shift efficiency, £m (%)	-1.0 (-1%)	-2.3 (-2%)	-3.7 (-3%)	-5.1 (-4%)	-6.6 (-5%)	
Final forecast, £m	**103.7**	**114.0**	**121.2**	**125.5**	**127.8**	
HAL forecast, £m	✂	✂	✂	✂	✂	
Difference with TA, £m	✂	✂	✂	✂	✂	✂

Source: Taylor Airey analysis

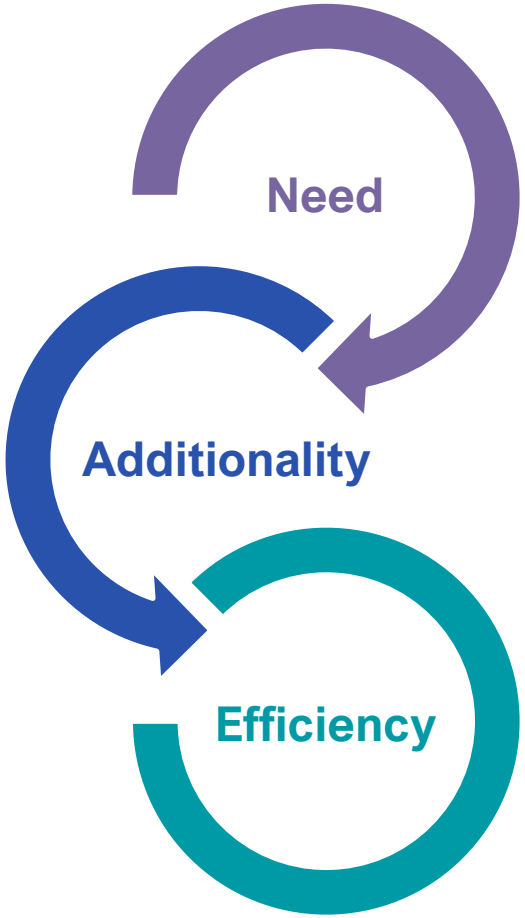
Section Three

Opex forecasts

G. Surface access initiatives

Terminal drop-off charge and surface access overlay

Surface Access Overlay (£m, 2018p)	2022	2023	2024	2025	2026	H7 Total



Terminal drop-off charge costs arise from the introduction of terminal drop-off charging which is new to HAL's operation. If terminal drop-off charging revenues are to be included in the forecast, it would therefore be consistent to include the cost of generating those revenues. Other Surface Access costs appear to be associated with specific initiatives which could be considered as discretionary. However, these are far less material.

There is insufficient evidence to determine whether the operational costs associated with terminal drop-off charging are additional. For example, there may already be an element of operational costs associated with staff marshalling traffic on the forecourts and this change may just mean that existing staff do their job in a different way.

Without any historical data, it is difficult to determine whether the costs proposed are efficient. Benchmarking with other airports may be possible but this has not been prioritised at this stage due to the relative scale of this overlay compared with other cost components.

At this stage we propose to retain the Terminal Drop-off Charge cost overlays suggested by HAL provided it generates the revenue returns detailed elsewhere in the plan. We expect to undertake further investigation at the final proposals stage to determine whether the costs proposed are truly efficient and fully incremental, and would welcome additional evidence from HAL. We have not included other SAS costs as an overlay as HAL has not provided any clear rationale for their inclusion.

Section Three

Opex forecasts

H. Frontier shift and input price inflation

Input price inflation: Summary of HAL's proposals

HAL uses different price indices to deflate/inflate historic costs to its 2018 price base, and to project the growth of different cost categories in nominal terms.

- Based on advice from First Economics, HAL has created four core price indices – RPI, wages, materials, and power.
  - Wages: 1.1%-3.5% (nominal) per annum (based on an OBR forecast).
  - Materials: 2.5% (nominal) per annum (based on First Economics advice).
  - Power: 1.3%-4.2% (nominal) per annum (based on a BEIS forecast).
  - The First Economics methodology focuses on four "principles".
    - *Input price inflation forecasts should be anchored against the most likely path for GDP growth.*
    - *Input price forecasts should be prepared on a nominal basis alongside a separate forecast of RPI-measured inflation.*
    - *Third-party forecasts should be used wherever possible.*
    - *Extrapolation from historical data is possible where no published price forecasts exist.*
- Each cost category is then projected using a blended rate depending on HAL's view of the proportion of costs driven by labour (wages), materials, power costs, or general price inflation
- In total this results in ✂ increase compared to the costs that would be taken into account if applying inflation only (HAL has used RPI).

Operating costs (£m, 2018 RPI prices)	H7 impact of IPI vs RPI
People	✂
Operational costs excl. insurance	✂
Insurance	✂
Facilities and maintenance costs	✂
Rates costs	✂
Utility costs excl. distribution contract	✂
Distribution contract	✂
General expenses	✂
Total Core Operating Costs	✂

Source: Taylor Airey analysis

HAL notes: "Input price inflation is not applied to the COVID-19, Surface Access or Enhanced Service cost overlays. This is because they are additional to the core operating cost model and are based on separate forecasts. However, if the input price inflation forecast were applied to the cost overlays, the impact would be in the region of ✂ over H7"

Input price inflation: Our view of HAL's overall methodology

Generally, the principles outlined by First Economics and applied by HAL are sensible. But, there are some key issues:

- Use of RPI as a measure of general price inflation in the economy.
  - As we explain earlier on, RPI is an inappropriate measure of general price inflation in the economy. RPI has a number of shortcomings, as highlighted by the Office of National Statistics.[1]
  - **We recommend the use of CPI instead.**
- HAL's RBP provides limited consideration of which categories may see price changes lower than the general price inflation and there is insufficient consideration of the extent to which HAL faces input price pressures different from that implied by economy-wide forecasts.
  - HAL's assessment of real price effects has tended to focus on areas where input prices will rise higher than general price inflation, whereas in reality, some inputs will see prices lower than general price inflation.
  - There needs to be a high bar for assuming prices increase over and above inflation for any cost category – the use of a measure for general price inflation is, by definition, a view on general price effects.
  - For some cost categories, such as wages, it is likely that HAL will face less price pressure given the general weakness in the aviation sector. This has not been considered by HAL.
  - **We review which categories of cost require an adjustment to reflect real price effects, and we revisit the forecasts used to estimate those.**
- No real evidence to suggest that materials inflation will be consistently higher than CPI.

1. ONS (2018) "Shortcomings of the Retail Prices Index as a measure of inflation". Accessible at https://www.ons.gov.uk/economy/inflationandpriceindices/articles/shortcomingsoftheretailpricesindexasameasureofinflation/2018-03-08

Input price inflation: Our view

We have followed the decision framework Ofwat applied at PR19[1] to determine fixed (real) input price inflation allowances, to consider whether it is appropriate to assume price increases over and above our measure of general price inflation. We have done this at a high-level looking primarily at the evidence and narrative provided by HAL. As such, some of this is judgement driven rather than being supported by in-depth analysis.

Ofwat's decision criteria	People	Operational costs	Facilities and Maintenance	Utilities	General expenses
Is the cost category a material proportion of total company costs?[2]	Yes	Yes	Yes	Partly (made up ~6% of opex in 2019)	Yes
Are there compelling reasons to think that [CPI] does not adequately capture the input price?	Yes	Unclear	Yes	Yes	Unlikely – No HAL analysis provided, but no clear rationale for why price pressures would be higher than general inflation
Is there a significant likelihood that the value of the wedge between the input price and [CPI] will differ substantially from zero over the period of the price control?	Yes – Can expect direct labour costs to differ from CPI	Potential. Unclear on data from HAL so far.	Yes – Includes large labour component, with limited supplier ability to absorb	Greater price volatility	Unlikely – No evidence to suggest it would.
Is the input price and exposure to that input price outside the management control during the duration of the price control?	Partly	No – mostly contracts where price increases can be managed through negotiations with suppliers	Partly	Partly	Yes
Use different price series?	**Yes**	**No**	**Yes**	**Yes**	**No**

Source: Taylor Airey analysis

1. Ofwat Criteria adapted from https://www.ofwat.gov.uk/wp-content/uploads/2019/01/Supplementary-technical-appendix-Europe-Economics-Frontier-Shift-and-Real-Price-Effects.pdf (Table 0.1).
2. We do not apply a precise materiality threshold, but generally consider costs that make up more than 10% of opex to be material, and between 5% and 10% of opex to be partly so.

Input price inflation: Our proposals

Based on our analysis overleaf, we use bespoke price series for the following cost categories:

- **People costs** – We follow the same methodology as HAL and use the same OBR source, but we assume wages stay constant in nominal terms in 2020 and 2021, consistent with the pay constraint implemented by HAL.
- **Utilities** – We follow the same methodology as HAL and use the same BEIS source, but as the BEIS forecasts are presented in real terms, we apply them to our CPI series (to get a nominal forecast) rather than HAL's RPI series.
- **Facilities and Maintenance** – We use a blended rate that is half driven by CPI and half driven by OBR's wage forecasts.

HAL proposals for nominal input price inflation (as per model)

(nominal, %)	2020	2021	2022	2023	2024	2025	2026
Power	1.5	2.2	4.9	2.3	2.3	3.0	3.0
Wages	3.0	3.6	3.4	2.4	3.0	3.5	3.5
Materials	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Source: HAL RBP model

HAL proposals for nominal input price inflation (as per document)

(nominal, %)	2020	2021	2022	2023	2024	2025	2026
Power	1.3	3.9	4.2	2.1	2.0	3.0	3.0
Wages	1.1	1.9	2.7	2.2	2.8	3.5	3.5
Materials	1.8	2.2	3.2	2.7	2.8	2.5	2.5

Source: HAL RBP document

Taylor Airey proposals for nominal input price inflation

(nominal, %)	2020	2021	2022	2023	2024	2025	2026
Power[1]	1.2	2.8	3.7	1.9	1.7	2.6	5.1
Wages[2]	0.0	0.0	1.4	2.6	3.1	3.4	3.6
Materials	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Taylor Airey analysis, BEIS, OBR

Notes:

1. For electricity price inflation (power), we use the same source as stated by HAL (BEIS Energy and Emissions Projection 2019 – Reference Scenario – Industrial retail electricity price). However, we have been unable to reconcile these figures with those used by HAL.
2. At a late stage in the process, we identified an error in our transposition of OBR's wage forecasts. We will address this in our revised forecasts for the CAA's final proposals.

1. In some areas, we have been unable to match either of HAL's forecasts exactly even when using the same sources.

Frontier shift and capital benefits

TAYLOR | AIREY

HAL approach

HAL combines these factors as follows:

- 0.1% benefit pa based on productivity improvements as an appropriate level for a Frontier Shift, based on analysis prepared by First Economics (applied to all cost categories except Rates and Distribution Contract).
- 1.1% savings based on opex benefits arising from the opex benefits of capital investment.

In HAL's proposal, the 1.1% capex benefit is contingent on approval of the £4.2bn capital plan as HAL claims that the projects that deliver opex efficiency are not included in lower cost capex plans.

Our view

We agree that there are likely to be two broad factors delivering the opportunity for improved efficiency in H7:

- A total factor productivity (TFP) type benefit
- Improvements in labour productivity potential above TFP growth – such as opex benefits arising from capital investment

However, we disagree with the approach taken by HAL to calculating potential 'capital substitution' effect and do not feel that it is supported by the study commissioned from First Economics or the precedents it quotes. We would expect capital investment to have a lagging effect when it comes to delivering benefits, and not be solely linked to projects in train as part of the H7 capital plan.

We therefore feel that the calculation of 1.1% provided by HAL in the RBP and the conditionality on particular projects being allowed in the agreed H7 capital plan is not supported by precedent or the evidence provided.

While recognising that more recent price determinations (e.g. RIIO-2, PR19) have considered frontier shift estimates of >1%, **we apply an overall frontier shift estimate of 1%** reflecting ongoing productivity gains supported by precedent developed over several price controls and reflecting that large, one-off efficiency savings are captured as overlays. **We propose not linking the frontier shift estimate with the size of the capital plan**.

Following HAL's approach, we apply our frontier shift estimate to all cost categories except for rates, the electricity distribution contract, and the new cost overlays introduced for H7 (e.g. opex related to the terminal drop-off charge, Covid-19 overlay etc).

	Opex	Capex
Ofgem, RIIO-GD1/T1, 2012	1.0%	0.7%
CAA, Heathrow Airport, 2014	1.0%	-
Competition Commission, Northern Ireland Electricity, 2014	1.0%	1.0%
Ofgem, RIIO-ED1, 2014 [A]	1.0%	0.7% to 1.0%
Utility Regulator, NI Water, 2014	0.9%	0.6%
CMA, Bristol Water, 2015	1.0%	-
Utility Regulator, GD17, 2016	1.0%	1.0%
Ofwat, PR19, 2019 (draft determination range)	~1% *	

Source: First Economics August 2019 - Frontier Shift, Input Price Inflation and Productivity Growth A report prepared for Heathrow Airport

Section Three

Opex forecasts

I. Capital Investment

Summary of HAL's proposals - Capex

HAL has presented the figure on the right to illustrate the make up of the portfolio of capital projects proposed within their capital plan.[1]

Figure 14: Programmatic Framework for the H7 capital plan

			PROGRAMMES						
Portfolio	**Objective**	**RBP Update #1**	**Asset Management**	**T2 Baggage**	**Security**	**Commercial Revenue**	**Efficient Airport**	**Carbon & Sustainability**	**Future Ready Airport**
Protect the Business	Asset Management & Compliance	£2,138m	Critical Safety, Security & Compliance Scope £1,500m	T2 Baggage £180m	Regulated Compliance £420m			Airspace Modernisation £38m	
	Protect Efficiency and Revenue	£360m				Protect existing Revenues £100m CrossRail £78m	Avoid material Opex Increases £100m iH7 Roll-Over £82m		
Win the Recovery	Efficient Airport	£734m			Security Transformation £130m Security Compliance £230m		Automation & Digitialisation £374m		
	Commercial Revenue Generation	£600m				Generate Incremental Revenues £600m			
Build Back Better	Carbon & Sustainability	£150m						Carbon & Sustainability £150m	
	Future Ready Airport	£185m	Potential to use some allocation for this activity	T2 Baggage Solution £35m			Potential to use some allocation for this activity		Build Resilience, Capacity & Service £150m
Total Portfolios		**£4,167**	**£1,500m**	**£215m**	**£780m**	**£778m**	**£556m**	**£188m**	**£150m**

1 Heathrow Airport Limited (2021) Revised Business Plan Update – 5.3 H7 Capital plan updates

Opex benefits from capital investment HAL's view

HAL proposes two alternative capital plans; a 'Safety Only' plan (£2.5bn) and an 'Optimal Plan' (£4.2bn)[1].

It suggests that opex efficiency benefits only arise from two programmes, the **Security Transformation** and **Efficient Airport** Programme. Both of these are only included in the Optimal capital plan and not the Safety Only capital plan.

Example initiatives that these programmes could deliver include:[2]

Initiative	Potential benefit
Changes to security processes, including algorithms and Centralised Image Processing	Higher flow rates per security lane, as well as a faster and more pleasant experience for passengers.
Automation of the airfield	Airport and airline efficiencies from safely operating the airfield while also increasing throughput and resilience by eliminating human error.
Automation of baggage systems	Opportunities to drive operational efficiencies in the safe operation of the baggage systems, while also increasing throughput and resilience by eliminating human error.
Changes to renewable energy supply	Reduction in total utility costs of operating the airport as well as enabling HAL to meaningfully decarbonise in H7.

Source: HAL

Further, HAL claims that the impact on passenger charge for the difference between investment in the Safety Only and Optimal capex plans would be entirely offset by the potential benefits from opex efficiency (1.2% pa of opex), as well as delivering benefits in Commercial Revenues.

Overleaf we consider the logic of these claims and the potential for opex benefits to arise from other elements of the Capital Plan. We have included a specific discussion on the Security Transformation elements of the proposed capita investment in the People costs section of this report.

1 Heathrow Airport Limited (2021) Revised Business Plan Update – 5.3 H7 Capital plan updates

2 Heathrow Airport Limited (2021) Revised Business Plan Update – 5.4 H7 Operating Cost updates

Opex benefits from capital investment: Our view

We conclude that HAL should consider whether opex benefits, for example in Facilities and Maintenance costs, arise from other parts of the capex portfolio, even in the Safety Only capital plan.

The 'Safety Only' capital plan delivers a portfolio of projects under the banner Protect the Business with two objectives:

- Asset management and compliance (£2.138bn)
- Protect efficiency and revenue (£0.36bn)

Our view is that there are likely to operating cost benefits arising from programmes in this plan – we disagree with HAL's view that opex benefits are only possible with the Optimal capital plan.

Having considered the additional detail provided on the rationale and prioritisation of these programmes provided by the RBP Update, we suggest that benefits are likely to be delivered by the following programmes in the Safety Only capital plan:

- Asset replacement (£1.5bn)
- T2 Baggage (£0.18bn)
- Regulated Compliance (£0.42bn)
- Avoid material Opex increases (£0.1bn)

We understand that the primary objective of this part of the capital portfolio is to deliver on mandatory requirements rather than enhance the asset base. In principle however, the replacement of end-of-life assets with newer, modern equipment with greater reliability would be expected to reduce the amount of time and resource required for planned and corrective maintenance with a positive benefit on the Facilities and Maintenance opex category.

Around 60% of the investment proposed in this plan is under the heading of Asset Replacement (£1.5bn). In this section of the RBP Update[1], HAL considers that a further £400m could have been added to the Asset Replacement budget. However, as a mitigation for not including this, it refers to the unsubstantiated potential need for, *"…a 10% uplift in maintenance opex to allow for increased maintenance regimes across the airport (which) could extend the life of assets and help to mitigate against assets being out of service…".*

As HAL considers the downside risk of increased opex due to lower capital spend on asset replacement there is clearly a link between capex and opex. It is, therefore, inconsistent that HAL does not consider the upside opportunity for opex reduction arising from a considerable investment in new and more resilient assets.

We therefore conclude that HAL must include opex benefits, for example in Facilities and Maintenance costs, arising from other parts of the capex portfolio, even in the Safety Only plan.

1 Heathrow Airport Limited (2021) Revised Business Plan Update – 5.3 H7 Capital plan updates

Section Three

Opex forecasts

J. Overall results

Summary of opex forecasts

HAL forecasts: *HAL mid pax forecasts, No RAB Adjustment*

Nominal, £m	2022	2023	2024	2025	2026
People	✂	✂	✂	✂	✂
Operational excl. insurance	✂	✂	✂	✂	✂
Insurance	✂	✂	✂	✂	✂
Facilities and maintenance	✂	✂	✂	✂	✂
Rates	✂	✂	✂	✂	✂
Utilities exc. distribution	✂	✂	✂	✂	✂
Distribution contract	✂	✂	✂	✂	✂
General expenses	✂	✂	✂	✂	✂
Surface access initiatives	✂	✂	✂	✂	✂
Other overlays	✂	✂	✂	✂	✂
Total	**1,109**	**1,229**	**1,317**	**1,382**	**1,435**
Total per passenger, £	26.70	21.86	20.06	19.64	19.92

Source: HAL Analysis

Note – HAL and Taylor Airey opex forecasts are reported on a consistent HAL Mid pax forecast scenario.

Taylor Airey forecasts: *HAL mid pax forecasts, No RAB Adjustment*

Nominal, £m	2022	2023	2024	2025	2026
People	244	266	280	283	283
Operational excl. insurance	223	253	273	283	288
Insurance	✂	✂	✂	✂	✂
Facilities and maintenance	146	161	172	180	185
Rates	123	125	127	130	132
Utilities exc. distribution	54	62	67	70	74
Distribution contract	✂	✂	✂	✂	✂
General expenses	104	114	121	125	128
Surface access initiatives	9	10	10	13	13
Other overlays	18	17	14	11	8
Total	**970**	**1,058**	**1,116**	**1,145**	**1,162**
Total per passenger, £	23.35	18.83	17.00	16.27	16.13

Difference with HAL, £m	**-139**	**-171**	**-201**	**-237**	**-273**
Cumulative difference, £m					**-1,021**

Source: Taylor Airey Analysis

Summary of opex forecasts

HAL forecasts: *HAL mid pax forecasts, No RAB Adjustment*

2018 RPI, £m	2022	2023	2024	2025	2026
People	✂	✂	✂	✂	✂
Operational excl. insurance	✂	✂	✂	✂	✂
Insurance	✂	✂	✂	✂	✂
Facilities and maintenance	✂	✂	✂	✂	✂
Rates	✂	✂	✂	✂	✂
Utilities exc. distribution	✂	✂	✂	✂	✂
Distribution contract	✂	✂	✂	✂	✂
General expenses	✂	✂	✂	✂	✂
Surface access initiatives	✂	✂	✂	✂	✂
Other overlays	✂	✂	✂	✂	✂
Total	**1,012**	**1,093**	**1,137**	**1,159**	**1,168**
Total per passenger, £	24.36	19.44	17.32	16.46	16.21

Source: HAL Analysis

Note – HAL and Taylor Airey opex forecasts are reported on a consistent HAL Mid pax forecast scenario.

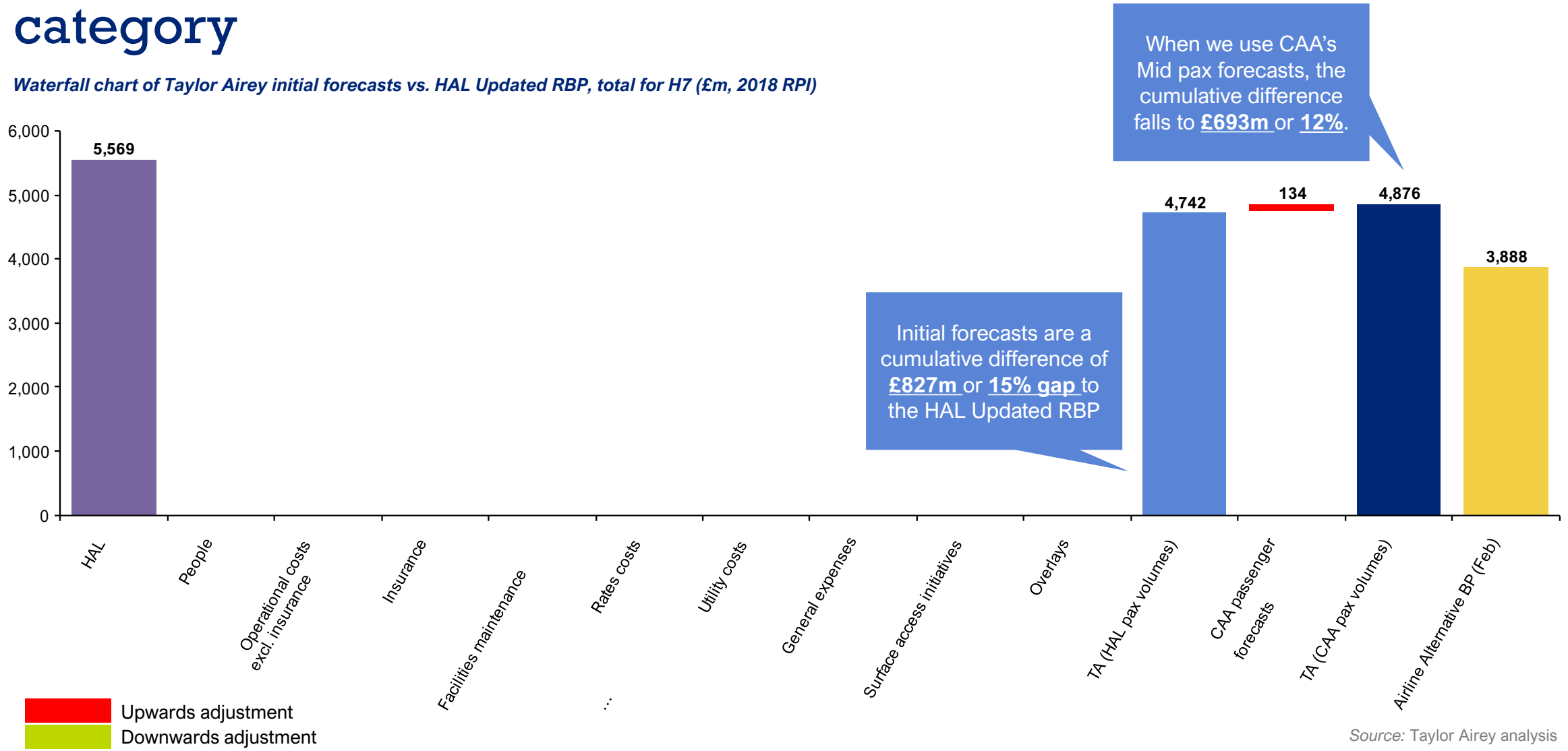
Taylor Airey forecasts: *HAL mid pax forecasts, No RAB Adjustment*

2018 RPI, £m	2022	2023	2024	2025	2026
People	224	238	245	240	233
Operational excl. insurance	204	227	238	240	237
Insurance	✂	✂	✂	✂	✂
Facilities and maintenance	134	145	151	152	152
Rates	113	112	111	110	109
Utilities exc. distribution	50	56	59	60	61
Distribution contract	✂	✂	✂	✂	✂
General expenses	95	102	106	106	105
Surface access initiatives	8	9	9	11	10
Other overlays	17	15	12	10	7
Total	**891**	**949**	**974**	**971**	**957**
Total per passenger, £	21.44	16.89	14.84	13.80	13.28
Difference with HAL, £m	**-121**	**-144**	**-163**	**-188**	**-211**
Cumulative difference, £m					**-827**

Source: Taylor Airey Analysis

Comparison of HAL and TA opex forecasts by category

Waterfall chart of Taylor Airey initial forecasts vs. HAL Updated RBP, total for H7 (£m, 2018 RPI)

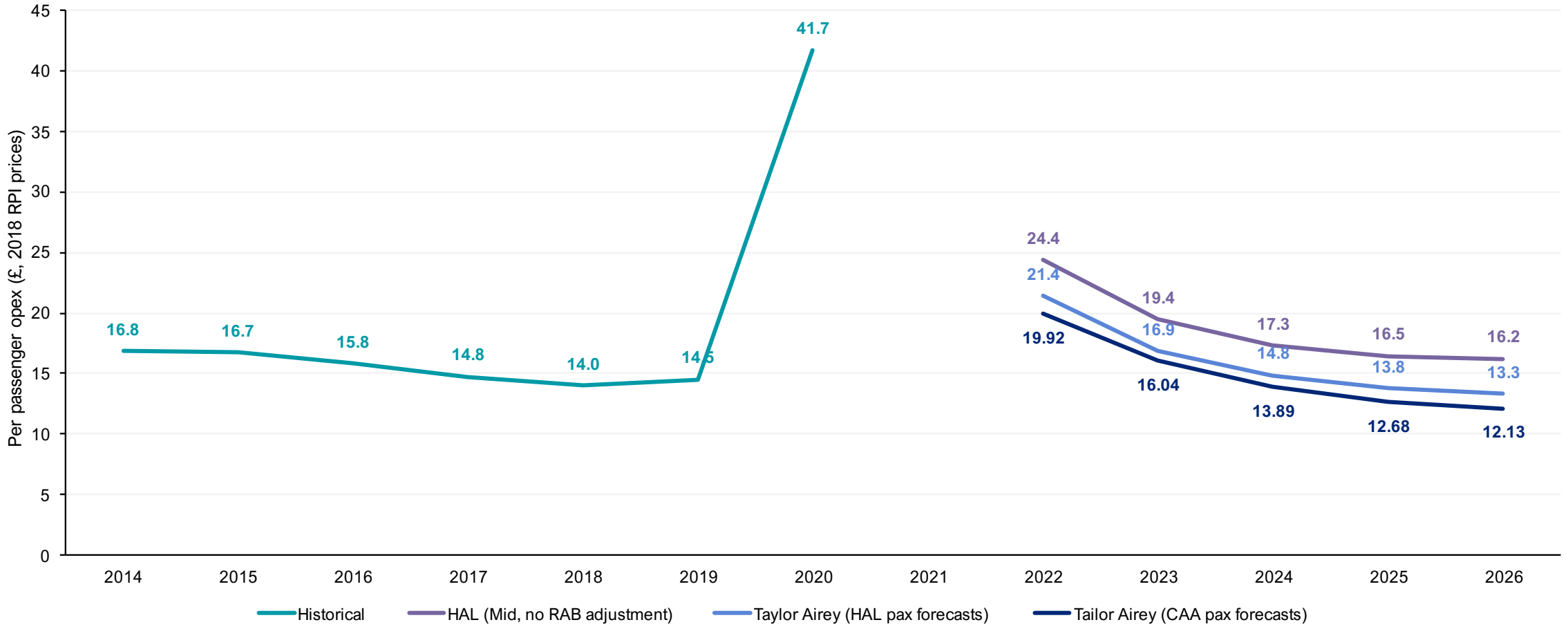


Source: Taylor Airey analysis

Note: HAL and Taylor Airey opex forecasts are reported on a consistent HAL Mid pax forecast scenario except for the final waterfall step which uses the CAA Mid pax forecast scenario.

Comparison of HAL and TA opex forecasts

Comparison of per passenger opex forecasts (£, 2018 RPI prices)



Note: Both HAL and the CAA have developed High, Mid, Low pax forecasts for the H7 period. We use the Mid pax forecast for figures presented above.

Total opex: Scenario comparison

HAL's opex forecasts under different scenarios

2018 RPI, £m	2022	2023	2024	2025	2026	H7
High, no RAB adjustment	1,046	1,126	1,168	1,187	1,194	**5,721**
Mid, no RAB adjustment	1,012	1,093	1,137	1,159	1,168	**5,569**
Low, no RAB adjustment	917	975	1,027	1,090	1,126	**5,135**
High, RAB adjustment	1,068	1,139	1,170	1,178	1,174	**5,728**
Mid, RAB adjustment	1,033	1,105	1,139	1,150	1,148	**5,575**
Low, RAB adjustment	912	964	1,009	1,064	1,092	**5,040**

Source: HAL analysis

Taylor Airey's opex forecasts under different CAA passenger forecast scenarios

2018 RPI, £m	2022	2023	2024	2025	2026	H7
High	946	1,005	1,033	1,033	1,019	5,036
Mid	909	966	1,000	1,006	995	4,876
Low	791	849	904	932	952	4,429

Source: Taylor Airey analysis

Per passenger opex: Scenario comparison

HAL's opex forecasts under different scenarios

2018 RPI, £	2022	2023	2024	2025	2026
High, no RAB adjustment	20.57	17.28	15.94	15.36	15.22
Mid, no RAB adjustment	24.36	19.44	17.32	16.46	16.21
Low, no RAB adjustment	62.88	31.24	21.91	19.72	18.48
High, RAB adjustment	20.21	16.81	15.37	14.67	14.40
Mid, RAB adjustment	23.93	18.92	16.70	15.72	15.34
Low, RAB adjustment	60.18	29.72	20.72	18.53	17.24

Source: HAL analysis

Taylor Airey's revenue forecasts under different CAA passenger forecast scenarios

2018 RPI, £	2022	2023	2024	2025	2026
High	17.47	14.48	12.90	11.99	11.54
Mid	19.92	16.04	13.89	12.68	12.13
Low	42.25	23.42	16.40	14.68	13.44

Source: Taylor Airey analysis

Section Four

Commercial revenue forecasts

A. Efficiency of 2019 figures as a baseline
B. Elasticities
C. Retail
D. Surface access
E. Property
F. Other non-aeronautical revenues
G. Cargo
H. Capital investment
I. Overall results

Section Four

Commercial revenue forecasts

A. Efficiency of 2019 figures as a baseline

Views on HAL's efficiency in 2019

The general consensus view is that HAL has historically outperformed its competitors in relation to commercial revenue generation. However, there is disagreement as to whether HAL's performance in 2019 remains at the efficiency frontier for all subcategories of revenue.

HAL claims in their RBP that 2019 presents an efficient baseline from which to project future commercial revenues.[1] It commissioned two consultancy studies to support their claim:

- KPMG undertook an econometric benchmarking study that concluded that HAL was at the efficiency frontier in 2018.[2]
- A benchmarking study by Pragma came to similar conclusions.[3]

Taylor Airey (on behalf of airlines) found that HAL's performance exceeded CAA forecasts, and are higher than comparator airports, but expresses some concern regarding HAL's analysis:[4]

- There was a variation in performance between different categories of revenue, which Taylor Airey argues needs to be explored further.
- It questioned the choice of comparators in Pragma's analysis and suggested that most of HAL's outperformance could be explained by a more favourable passenger mix.
- It also argued there was insufficient detail provided in KPMG's analysis to properly scrutinise its robustness. In particular, it noted that significant variation is observed in the revenue time series, especially for property revenues, which was unexplained.

SDG (on behalf of the CAA) reviewed HAL's commercial revenues performance in 2017.[5] It found that:

- In 2015, HAL was ahead of UK and global peers for overall commercial revenue generation.
- In retail, HAL was ahead of its peers though slightly behind Gatwick Airport for catering.
- For car parking, HAL was ahead of its peers with the exception of the Manchester Airport Group airports.
- For property, HAL was generally ahead of its peers.

1. Heathrow Airport Limited (2021) Revised Business Plan – Chapter 7: Commercial Revenues
2. KPMG (2019) Airport Commercial Revenue Efficiency Benchmarking Report for Heathrow Airport Limited
3. Pragma (2019) Heathrow Airport Limited: Commercial Benchmarking 2019
4. Taylor Airey (2020) Heathrow H7 Commercial Revenues review Final Report – Executive Summary
5. Steer Davies Gleave (2017) Heathrow Airport – Review of Commercial Revenues

CEPA's views on HAL's efficiency in 2019

We accept the starting assumption that HAL's performance in 2015 was at the efficiency frontier, based on SDG's previous analysis for the CAA. Beyond 2015, we see that HAL's ability to grow revenue has stagnated but probably not enough for it to now be materially inefficient.

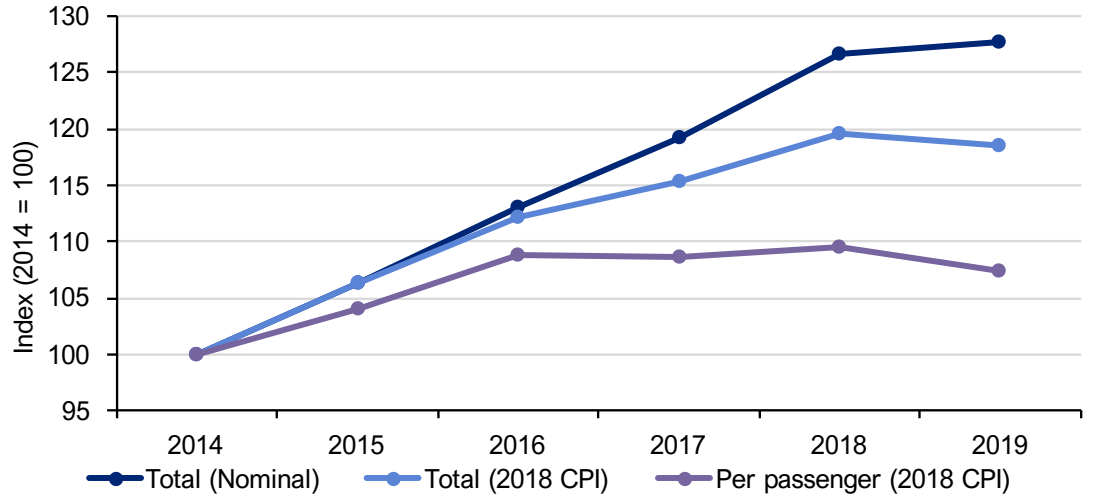
As shown in the chart on the right, **HAL's per passenger revenues in 2019 were broadly similar to what they were in 2015**. The key question is whether this stagnation in performance now means HAL is no longer at the efficiency frontier for commercial revenue generation.

We have some concerns with the KPMG analysis commissioned by HAL:

- Our key concern, as aired previously in our work for the LACC, is that the econometric benchmarking does not show (as is claimed by KPMG and HAL) that HAL operated at the efficiency frontier by 2019. Instead it shows HAL's **change in relative performance**, over the period assessed. In other words, it shows whether, over the period assessed, HAL has improved by more than its peers or by less than its peers.
- We also share Taylor Airey's concern about the lack of transparency around the methodology. BUT, the KPMG analysis does find that HAL's relative performance improved over the period 2015-2018 for retail and car parking, with property being the one exception.

This suggests that HAL's overall commercial revenues are likely to have been efficient in 2018, though there may have been scope for more revenue generation in 2019 particularly in property. **At this stage we have not proposed any efficiency adjustments.**

HAL commercial revenues over Q6 (2014-2019)



Source: CEPA analysis of HAL regulatory accounts, statutory accounts and RBP model

HAL commercial revenues over Q6 (2014-2019)

Commercial revenues	2014	2015	2016	2017	2018	2019
Total (£m, nominal)	778.9	828.3	880.4	929.3	986.3	994.7
Total (£m, 2018 CPI)	824.8	877.2	925.8	951.8	986.3	977.1
Per passenger (nominal)	10.6	11.0	11.6	11.9	12.3	12.3
Per passenger (£, 2018 CPI)	11.2	11.7	12.2	12.2	12.3	12.1

Source: CEPA analysis of HAL regulatory accounts, statutory accounts and RBP model

Section Four

Commercial revenue forecasts

B. Elasticities

Summary of HAL's elasticity proposals

HAL has used a mixture of econometric analysis and judgement to inform its choice of revenue drivers and elasticities.

Revenue elasticities: *HAL's choice of key revenue drivers and associated elasticity estimates*

Area	HAL[1]	KPMG[2]	Frontier[3]	Discussion
Retail revenue with respect to passenger numbers	✂	✂	✂	HAL refers to Frontier Economics' analysis showing a strong relationship between passenger numbers and retail revenue. It also claims the elasticity estimate includes the 'management challenge', using the Pragma study[4] to argue that HAL's historic performance is the best indicator of the size of the management challenge.
Property revenue with respect to total utilised terminal space	✂	✂	✂	The source of the ✂ elasticity estimate is not explained. HAL previously used passenger numbers as a revenue driver but changed to using terminal space following the constructive engagement process.
Car parking / rental revenue with respect to car parking / rental passengers	✂	✂	✂	HAL refers to the KPMG benchmarking evidence of a 'potential' relationship between passenger numbers and revenue. Frontier Economics warned of past experience being a poor estimator of the future, and found ✂ less car parking revenue for each additional percentage point of international passengers.
Heathrow Express (HEx) revenue with respect to HEx passengers	✂	✂	✂	Neither benchmarking exercise found a robust relationship. HAL claims it would like to maintain the yield per passenger throughout the period, though separate overlays have been applied to account for reduction in yield and passenger volumes due to the pandemic and Crossrail.
Other income (services) with respect to passenger numbers	✂	✂	✂	No evidence has been provided in support of HAL's elasticity estimate.

1. HAL RBP Tables 3 and 10
2. KPMG (2019) Airport Commercial Revenue Efficiency Benchmarking Report for Heathrow Airport Limited
3. Frontier Economics (2019) Developing opex and commercial revenue elasticities for H7
4. Pragma (2019) Heathrow Airport Limited: Commercial Benchmarking 2019
5. Frontier Economics estimated an elasticity of ✂ for total surface access revenue with respect to passengers but notes "given the expected changes to these factors during H7, we would exercise caution in producing a forecast using the ✂ elasticity estimate"

Management challenge

HAL claims their retail elasticity estimate is inclusive of a management challenge and, therefore, no separate adjustment is required. It also does not propose a management challenge allowance for any of the other revenue categories. We disagree with this and propose a separate adjustment.

Management challenge

The management challenge reflects the year-on-year improvement in Heathrow management's ability to increase revenue over and above passenger growth (or other revenue drivers).

- HAL claims that their elasticity estimate for retail revenue w.r.t passengers includes an estimate for the management challenge. It does not explicitly make any claims regarding the management challenge for the other categories of revenue.
- There is no particular reason why a management challenge should not apply to other revenue categories (such as surface access), and as we note later in this report, there are specific capex and other management initiatives aimed at increasing revenues in these areas.
- For retail specifically, it is not appropriate to bundle the management challenge and elasticity estimates together, as they are two distinct concepts. Management ability to grow revenue per passenger is independent of changes in passenger volumes.
  - The management challenge is to address a range of areas that the airport can strategically address regardless of passenger growth,
  - For H7 in particular, passenger volumes are declining relative to 2019 and as such, the elasticity driven forecast is working in the opposite direction to the management challenge. There is no logical reason to expect Heathrow management's ability to drive revenue growth (over and above volume-related drivers) would reverse when passenger volumes decline.
- **As a result, we recommend a management challenge of 2% per annum, as recommended in our review of HAL's proposals for iH7:**
  - Between 2008 and 2017, HAL's per passenger commercial revenues increased by roughly 3% per annum in real terms. For iH7, we proposed a management challenge of 2% per annum as the mid point between HAL's proposed 1% and the 3% historic trend.
  - We see this 2% estimate as capturing several factors:
    - All the mitigations against the downside step changes assumed in our forecasts (e.g. the mitigation against the retail tax changes)
    - Returns from recent capital investments aimed at increasing revenue generation
    - Our switch from RPI indexation for future revenues to CPI indexation

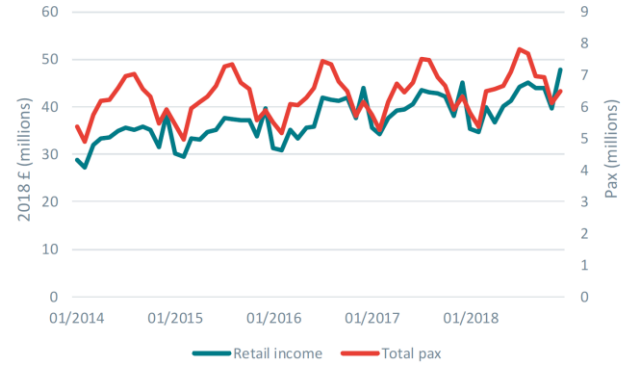
Retail elasticity

HAL's inclusion of the management challenge within its retail elasticity figure creates an upward bias to the estimate of the pure retail elasticity. We have not adjusted HAL's retail elasticity estimate, but we expect this may need to be reviewed for our final forecasts.

Retail elasticity

- HAL has proposed an elasticity of ✂ for forecasting retail volumes with respect to passenger numbers, drawing on econometric analysis undertaken by Frontier Economics.
- As discussed on the previous slide, we do not think it is appropriate to include an allowance for management challenge within the elasticity estimate. There is a risk of an upward bias to HAL's elasticity estimate if there is a positive correlation between growth in passenger volumes and the management challenge.
- However, we note that Frontier Economics estimated the retail elasticity using month-on-month changes in retail revenues and passenger volumes (as shown in the chart on the right). And as passenger numbers do decline in this month-on-month series, the correlation with management challenge (which we assume grows with time) is weaker.
- We conclude that there is a small risk of upward bias to the elasticity estimate of ✂, but have chosen not to make an adjustment for this in our initial forecasts.
- Nevertheless, we recommend that HAL re-estimates the elasticity while stripping out the effect of the management challenge, either with the addition of a time variable, or through an ex-ante adjustment to the retail revenue time series. We also consider it inappropriate to use retail revenues expressed in 2018 RPI prices – and instead recommend deflating using CPI.

Figure 23 Retail revenue and total passengers



Source: *Frontier analysis of Heathrow data*

Bureaux elasticity

- HAL does not assume any elasticity for bureaux revenue with respect to any cost driver.
- We suspect this may be because historically, HAL's concession income from Travelex has been on a fixed price basis.
- Nevertheless, we understand that this is unlikely to be the case going forwards. As a result, we consider not applying a passenger driven elasticity to be counterintuitive, and propose extending the retail elasticity of ✂ to cover bureaux income as well.

Property elasticity

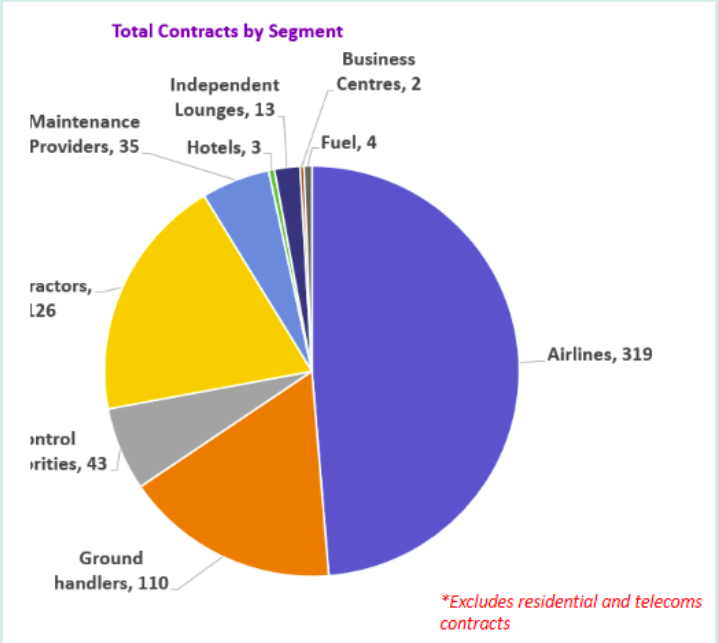
Property elasticity

HAL has proposed an elasticity of ✂ for property revenue with respect to utilised terminal space. But this is not supported by any evidence.

- No evidence or rationale has been provided to support this figure or to support the use of terminal space as a revenue driver.
- Neither of HAL's consultant reports found a strong relationship between property revenues and logical drivers such as passengers, terminal space, etc.
- Therefore, we cannot conclude that the ✂ elasticity estimate is valid or appropriate

We do not have access to enough information to develop a robust alternative assumption. But based on the evidence we do have, we assume an elasticity of 0.25 with respect to utilised terminal space.

- Rather than using top-down elasticities unsupported by any evidence, a more bottom-up approach would be more appropriate (i.e. considering the property portfolio and estimating the extent to which different building blocks of the portfolio are driven by terminal space or passenger volumes).
- We propose an elasticity of 0.25 – this is to reflect that a certain proportion of HAL's property revenues may be driven by utilised terminal space (such as airport lounges) but a large proportion is likely to be unaffected (e.g. office space, hotels, ground handler accommodation).
- The chart below (provided to Taylor Airey by HAL) shows a breakdown of property contracts by segment. We assume revenues by segment broadly match the number of contracts in each segment.
- We also assume roughly half the airline contracts relate to lounges.



Source: Taylor Airey analysis of HAL data

Other elasticities

Car parking/rental revenue

HAL has proposed an elasticity of ✂ with respect to car parking/rental passengers. KPMG gave a range of ✂ with respect to total passengers, while Frontier did not make a recommendation.

In the absence of robust econometric evidence, we are content with the proposal of ✂ – the implicit assumption being that the marginal passenger yields as much revenue as the average passenger. We then separately consider the impact of COVID-19 on average yields.

Heathrow Express revenue

HAL has proposed an elasticity of ✂ with respect to HEx passengers. Neither KPMG nor Frontier had suggested any values.

As the impact on yields as a result of COVID-19 and the introduction of Crossrail services is dealt with separately, an elasticity estimate of ✂ is logical. As a result, we accept the elasticity estimate on that basis.

Other service revenue

HAL has proposed an elasticity of ✂ with respect to passenger numbers. Neither KPMG nor Frontier had suggested any values. This revenue category is defined by HAL as including *"commercial revenue from activities not captured by the other categories such as advertising revenue, Fast Track Income, VIP Charges or aviation fuel."*[1]

An elasticity of ✂ is likely to be an overestimate:

- Advertising revenue is unlikely to be affected on a one-for-one basis by passenger volumes.
- As ATM volumes have not declined as much as passenger volumes, sales of aviation fuel are also unlikely to have a direct one-for-one relationship with passenger volumes.

As a result, we propose an elasticity of 0.8 – as we had assumed in iH7. For comparison, HAL had proposed an elasticity of ✂ for this category of revenue in their iH7 proposals.

1. HAL RBP Page 51 – However, we note that in subsequent engagement with HAL, we have had confirmation that advertising is captured within the Retail revenue category

Section Four

Commercial revenue forecasts

C. Retail

Summary of HAL's narrative supporting their retail forecasts

HAL has presented retail as being an area subject to a series of headwinds – an unfavourable passenger mix due to pandemic-related restrictions, a general move towards online shopping, the removal of airside tax-free shopping, the removal of the VAT retail-export scheme, and the continued decline of the currency exchange business. Of these, three specific overlays have been applied to the forecasts.

Retail tax changes

HAL assumes the impact of the various tax changes will reduce retail revenues by ✂ in 2022 relative to 2019, falling to ✂ in 2026 (previously a uniform ✂ reduction in the December 2020 RBP). The tax changes can be broadly split into three categories:

- The loss of **airside tax free pricing,** which will lead to:
  - A reduction in retail concession income from store closures (mostly luxury and fashion, technology and duty-free);
  - Less retail concession income from retailers who choose to absorb the additional VAT in return for lower concession rates;
  - Lost sales due to the passenger response to price increases, leading to a loss in concession income.
- The removal of the **VAT RES scheme,** which will lead to:
  - Lost concession income from Travelex who process VAT Refunds; and
  - An indirect loss in revenue from retail sales that are made by passengers using the cash they receive from VAT refunds
- The **extension of excise duty relief** on alcohol and tobacco to EU passengers, which will lead to higher duty free income.

Retail impacts from COVID-19

HAL assumes that changes in the passenger mix will lead to a ✂ decline in revenue (relative to 2019) in 2022 and a ✂ decline in 2023, before returning to normal.

This is based on their forecast of the passenger mix, with fewer higher-spending Asia/Pacific passengers, and more lower spending domestic and European passengers.

Bureaux

HAL assumes a ✂ decline in bureaux income relative to 2019.

This is based on a decline in currency exchange transactions affecting the renegotiation of the Travelex contract.

Retail: Summary of HAL's proposals – real

Retail: *Catering, Duty Free, Specialist Shops, Advertising, VAT refunds*

2018 RPI prices	2022	2023	2024	2025	2026
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Overlay, £m (%)	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

Note: The Retail forecasts in the Commercial revenues chapter differ from those in the model. Over the H7 period, the Retail revenue forecasts are approximately ✂ higher in the model (see below).

Final forecast (chapter), £m	✂	✂	✂	✂	✂

- HAL's volume adjustment is linked to reduced passenger numbers, which HAL expects will reduce the income it receives from retail concessions.
- The overlay relates to two effects:
  - A change in passenger mix implying a ✂ reduction in revenues relative to the baseline.
  - The loss of the VAT Retail Export Scheme / airside tax free and VAT refund concession income, which is assumed to reduce revenues by ✂ relative to the baseline.

Bureaux

2018 RPI prices	2022	2023	2024	2025	2026
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Overlay, £m (%)	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

- HAL assumes their bureaux income is not linked to any volumes.
- The overlay is linked to the long-term decline in the currency exchange business:
  - Assume a ✂ reduction to Bureaux revenues

Retail: Summary of HAL's proposals – nominal

Retail: *Catering, Duty Free, Specialist Shops, Advertising, VAT refunds*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	✂	✂	✂	✂	✂
RPI increase, £m (%)	✂	✂	✂	✂	✂
Price adj. forecast, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Overlay, £m (%)	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

Bureaux

Nominal	2022	2023	2024	2025	2026
Baseline, £m	✂	✂	✂	✂	✂
RPI increase, £m (%)	✂	✂	✂	✂	✂
Price adj. forecast, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Overlay, £m (%)	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

Retail: Change in passenger mix – HAL's proposals and issues

HAL proposals – HAL assumes changes in the passenger mix will lead to a further reduction in retail revenue in 2022 and 2023, due to there being more (lower-spending) UK and EEA passengers and fewer (higher-spending) Asia/Pacific passengers. The tables below show HAL's assumptions around the passenger mix, and the estimated impact on retail concession income.

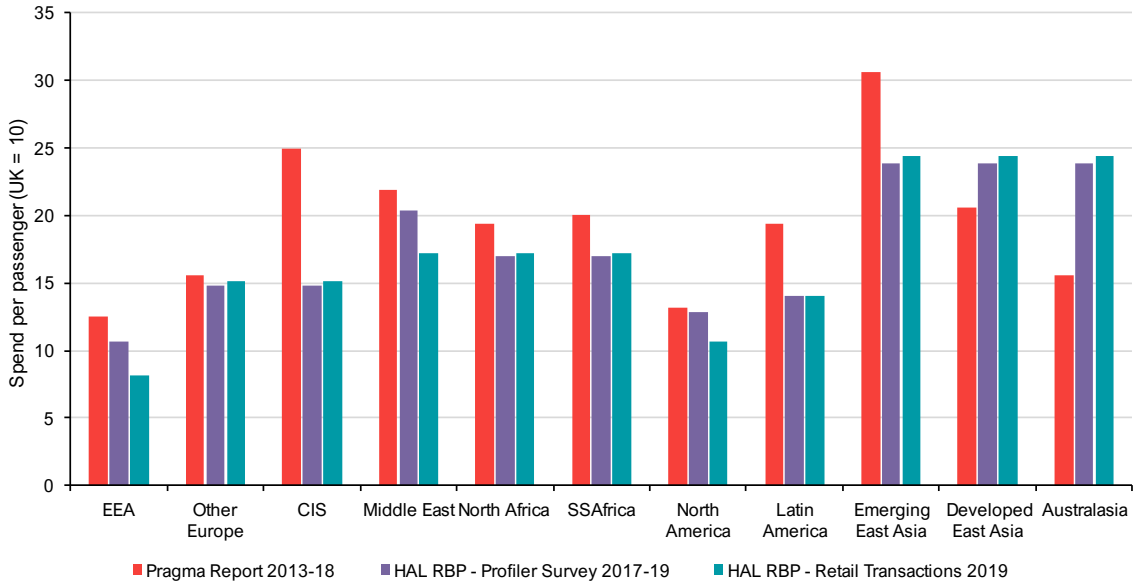
Table 12: Passenger O&D Mix Forecast

Table 13: H7 Covid-19 Impact Overlay – RBP vs Update 1

Source: HAL RBP Update 1 (June 2021)

CEPA view – We accept the logic that changes in the passenger mix could affect retail concession income. However, we note that the evidence around geographic variation in spend per passenger is not fully consistent (see chart below). We also note that our forecasts will ultimately use the CAA's forecasts of the passenger mix rather than HAL's (although in this section we use HAL's forecasts to allow for a like-for-like comparison).

Spend per passenger by market using different sources of evidence, *where UK = 10*



Source: CEPA analysis of Pragma report and HAL RBP Update 1

Retail: Change in passenger mix – CEPA proposal

Rather than applying an overlay, we have chosen to separately forecast retail revenue by market. This has two key advantages over HAL's approach - it provides a more transparent approach to assessing the impact of changes in the passenger mix on retail revenues, and it allows our model (and the forecasts) to automatically adjust to changes in passenger mix assumptions. To do this, we have broken retail revenue to a more granular level than is available within HAL's forecasts, triangulating accounts data from different HAL sources:

Retail revenue in 2019 by sub-category

£m, nominal	HAL RBP Model	HAL stat accounts	HAL reg accounts	CEPA proposal
Retail excl. Bureaux	✂	-	-	-
Bureaux	✂	-	-	40.1
Retail concessions [1]	-	342.0	339.0	342.0
Catering	-	64.0	64.0	64.0
Other retail [2]	-	113.0	113.0	72.9
Total	✂	**519.0**	**516.0**	**519.0**

Source: HAL RBP model, HAL statutory accounts, HAL regulatory accounts, CEPA analysis

1. These can be broken down further into Duty Free and specialist shops
2. Includes other retail services such as vending, left luggage, and possibly advertising.

Retail concession revenue in 2019 by OD market

Market	Revenues (£m, nominal)
✂	✂
✂	✂
✂	✂
✂	✂
✂	✂
✂	✂
✂	✂
✂	✂
Total retail concessions	**342.0**

Source: CEPA analysis of spend per passenger data from HAL RBP Update 1 and passenger numbers data from HAL's regulatory accounts

Our modelling approach leads to slightly different results than HAL's overlay. The table below shows HAL's proposed overlay compared with CEPA's estimate of the impact of changes in the passenger mix, both using HAL's passenger mix assumptions and using CAA's passenger mix assumptions:

	2022	2023	2024	2025	2026
HAL RBP Update 1	✂	✂	✂	✂	✂
CEPA using HAL passenger forecasts	-6.4%	-1.6%	0.8%	1.8%	2.8%
CEPA using CAA passenger forecasts	-7.8%	-3.4%	-1.0%	-0.9%	-0.9%

Source: CEPA analysis, HAL RBP

Retail: Tax changes – HAL's proposals

The tax changes affecting HAL's retail revenue are made up of three distinct mechanisms:

- The removal of the **VAT Retail Export scheme** means overseas visitors can no longer claim VAT refunds for goods purchased in the UK for export. HAL consider this will lead to a loss in income from Travelex for the VAT refund concession (VAT Refund Direct), and an indirect loss to retail concession income from visitors no longer spending their refunds at the airport (VAT Refund Indirect).
- The removal of **airside tax free shopping** for non-EU passengers on all goods, is assumed to have a direct effect on retail concession income through a number of different mechanisms (Store reorganisation, VAT Absorption, Passenger behaviour), and an indirect effect on advertising income from retailers (Advertising).
- The extension of **alcohol and tobacco excise duty free to EEA passengers**, is assumed to have a positive effect on retail concession income (DF (EEA) opportunity).

HAL's proposals also account for potential mitigations (e.g. RofW opportunity).

Figure 4: VAT Impacts to Commercial Revenues

Source: HAL RBP Update 1 (July 2021)

***HAL's overlay assumptions in RBP Update 1** presented as an adjustment to 2019 passenger numbers*

£m, 2019 prices[1]	2019	2022	2023	2024	2025	2026
Retail income	✂[2]					
Store reorganisation		✂	✂	✂	✂	✂
VAT Absorption		✂	✂	✂	✂	✂
Passenger behaviour		✂	✂	✂	✂	✂
VAT Refund Direct		✂	✂	✂	✂	✂
VAT Refund Indirect		✂	✂	✂	✂	✂
Advertising		✂	✂	✂	✂	✂
DF (EEA) opportunity		✂	✂	✂	✂	✂
RofW opportunity		✂	✂	✂	✂	✂
Total adjustment		✂	✂	✂	✂	✂
Overlay (%)[3]		✂	✂	✂	✂	✂

Source: HAL RBP Update 1 (July 2021).

1. Price base assumed
2. Retail income in HAL's RBP model in 2019 is given as ✂ instead of ✂ but the impact of this difference is immaterial
3. Numbers do not align exactly due to rounding differences

Retail: Tax changes – Issues

The figures presented suggest HAL has attempted to do bottom-up modelling to support their percentage overlay assumptions, and the level of detail provided in the Update 1 to the RBP is a substantial improvement on the original RBP. Nevertheless, there is still a lack of clarity around some of the figures presented and how the assumptions driving those figures have been derived:

- No detail has been provided around the ✂ loss due to changes in passenger behaviour, and how it interacts with the store reorganisation and VAT absorption impacts. The multiple overlays applied to account for the direct effect on removing airside tax free shopping on retail concession income, creates a material risk of double counting.
- It is not clear where the assumption around the ✂ loss in VAT refund income comes from – this should be a relatively simple observation from HAL's accounting system, but in the material presented over the past year, we have been provided three different estimates (✂).
- No detail has been provided around how the duty free opportunities have been estimated. We are particularly interested in how HAL has estimated the impact of extended excise duty free to EEA passengers, which will have a material effect on alcohol and tobacco sales.

In the original RBP and subsequent presentations to the CAA, HAL presented an alternate methodology to support its percentage overlay assumptions (presented in the table below). Our analysis of the previous approach showed that HAL relied on some implausible assumptions to produce the overlay assumptions.

Although HAL used an alternate approach to estimating the overlay assumptions in its RBP Update 1, our findings are likely to still apply, given the percentage overlays are similar:

- The implied elasticities are very high, at more than -2
- We can not see a rationale for why F&B or Bookshops would be affected by changes to VAT rules given the tax treatment of food and books remains unchanged.

HAL's overlay assumptions in the original RBP and CEPA estimates of the implied price elasticities

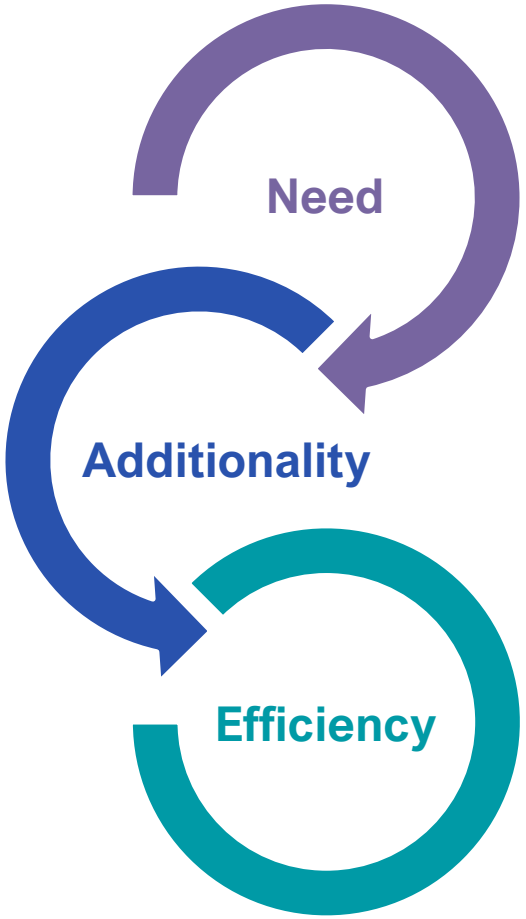
	% of revenues non-EU	Revenue impact from price increases	Revenue impact from store closures	Overall revenue impact	Implied elasticities	
					Price increase	Overall impact
World Duty Free	✂	✂	✂	✂	-2.47	-2.47
Specialist shops	✂	✂	✂	✂	-2.36	-2.80
Food & Beverage	✂	✂	✂	✂		-1.00
Bookshops	✂	✂	✂	✂		-1.00
Total Concessions	✂	✂	✂	✂	-2.17	-2.61

Source: Post-RBP CAA Engagement Commercial Revenues (1 March 2021)

Previous overlay assumption

Source: CEPA analysis

Retail: Tax changes – CEPA findings



The impact of removing airside tax free on revenues, even when accounting for the duty free extension on alcohol and tobacco sales, remains material and needs to be considered as a separate overlay.

Similarly, the removal the VAT RES scheme will lead to a loss in income from the Travelex VAT refund concession, which also needs to be covered as an overlay.

However, the indirect loss of sales due to the removal of the VAT RES scheme does not meet the needs test. No compelling evidence has been provided to support the assumption that the refunds received by passengers are then spent at the departure lounge. As a result, we recommend not making an adjustment to account for this component of the overlay.

We consider the impact of tax changes to be a genuine step change that is not accounted for elsewhere.

We can not conclude that the size of the overlay proposed by HAL reflects an efficient adjustment to HAL's retail revenue forecasts. Key assumptions that drive the size of the adjustment have not been explained or supported by any evidence. As such, we propose an alternative approach as described in subsequent slides.

Retail: Tax changes – CEPA approach

We propose using a top-down elasticity-based approach to estimate the impact on retail concession income from: (1) removing airside tax free and (2) extending excise duty free for alcohol and tobacco to EU/EEA passengers. We use the same elasticity for both tax changes.

Our elasticity-based approach **provides a broad approximation of the loss to the full value chain from the tax changes**, capturing any loss in sales from price increases, any loss in concession income from retailers absorbing the rise in VAT, any impact on store closures, and any reduction in advertising revenues.

The OBR used price elasticity of demand estimates ranging from -0.5 and -2 when estimating the impact of the tax changes.[1] This estimate accounted for both changes in the number of tourists travelling to the UK following the tax change, and any changes in their spending patterns. **We propose using the mid-way estimate of -1.25** to only account for the second of these impacts (as the former is considered separately through the passenger forecasts). However, we recognise this is a key area of uncertainty and would welcome any evidence from HAL that supports a different elasticity assumption.

We also separately estimate the loss in VAT refund concession income, using HAL's most recent estimate of ✂ (nominal) in 2019.

This assumption will need validating for our final forecasts, preferably through confirmation from HAL around the historic value of the VAT refund concession contract.

The top-down approach to estimating the impact of tax changes on retail concession income, does not capture certain nuances and details that would be captured through a more detailed bottom-up analysis. But the overall effect of these details are likely to be neutral:

- We assume all of the cost of tax changes will be borne by HAL in the form of lower concession income from retailers. In reality, some of the cost may be borne by the retailers.
- We have not accounted for any 'frictions' where stores remain empty for a period when being vacated by one retailer and replaced by another.
- We have not explicitly considered any mitigations that HAL or retailers could implement to reduce the effect on revenues (though this is captured implicitly within our management stretch assumption).
- Our elasticity estimate, in theory, accounts for both the volume effect (the reduction in transactions due to fewer passengers) and the price effect (the reduction in spending per passenger). This risks double counting the volume effect, as it is also captured within the passenger forecasts.
- We have not separated out revenue from landside sales or bookshops, where taxes remain unchanged.

1. See *CEBR (2020) The Impact of Ending Tax Free Shopping in the UK, p.13* and *OBR (2020) Economic and Fiscal Outlook: November 2020, p.183*. For the upper bound, we round up from -1.9.

Retail: Tax changes – CEPA proposal

In the table below, we present the results of our elasticity based approach to the tax changes, assuming a 2019 passenger mix. However, as mentioned previously, our actual modelling breaks down retail income into catering, retail concessions (duty free and specialist shops), and other retail revenue, and further breaks down retail concession income by geography. We have applied our elasticity based approach to the individual categories rather than applying a single percentage overlay. This allows us to estimate the impact of tax changes while accounting for any future changes in the passenger mix.

		% of retail revenue affected [1]	Implied price change [2]	Impact on revenues [3]
Airside tax free	Non-UK and non-EEA sales	70.6%	20%	-25%
Excise	EEA alcohol sales	2.8%	-60%	75%
	EEA tobacco sales	1.8%	-75%	94%
VAT refunds	Other retail revenue	4.4%	N/A	-100%
	Weighted average impact on all retail revenues (excl. Bureaux)			**-13.5%**

Comparable to HAL's ✂ to ✂ overlay estimates

Source: CEPA analysis

1. **Proportion of retail revenue**.
   - Non-UK and non-EEA sales are estimated using average spend per passenger data in HAL's most recent RBP update, and passenger number breakdowns in the regulatory accounts.
   - Using information from the Pragma report and from HAL's presentation to the CAA, we estimate that 6% of retail concession income came from EEA alcohol and tobacco sales. We then use 2018 data from Statista.com on duty free sales worldwide in 2018 to estimate the relative proportions of alcohol and tobacco.
2. **Estimated change in prices from tax changes.** Data from OECD Library Excise duties in OECD countries (tobacco), WSTA Facts and Figures (alcohol) provides estimates of the proportion of retail price that consists of taxes (56% for wine, 77% for spirits and 79% for tobacco). After removing effect of VAT, we can estimate the implied price reduction once excise duty is removed.
3. **Impact of price change on revenues.** We use an elasticity of 1.25 to estimate impact of revenues (see previous slide).

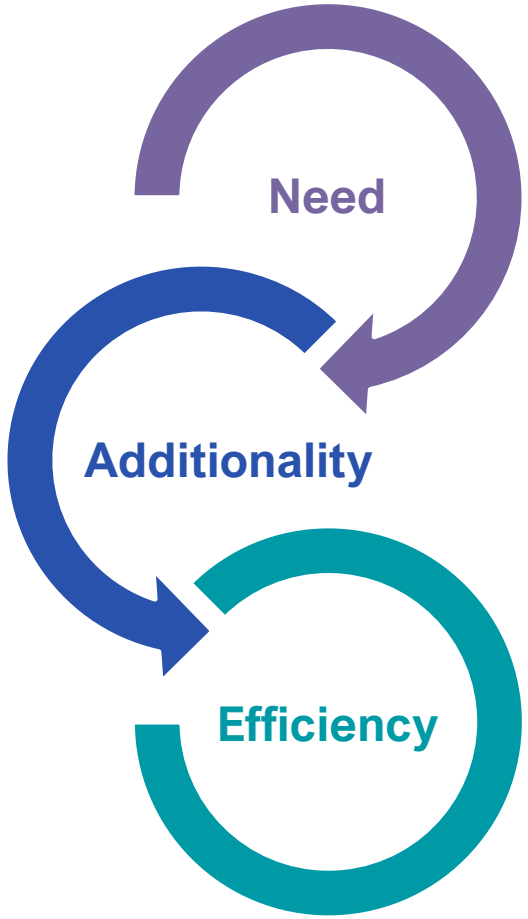
Comparison HAL's overlay with implied CEPA overlay to all retail revenues (excl. Bureaux) after accounting for changes to passenger mix.

	2022	2023	2024	2025	2026
HAL RBP Update 1	✂	✂	✂	✂	✂
CEPA	-12.0%	-12.7%	-13.2%	-13.3%	-13.2%

Source: CEPA analysis, HAL RBP

Retail: Bureaux overlay – CEPA analysis

HAL has suggested that Bureaux revenue will reduce by ✂ relative to 2019 during H7. The RBP offers little explanation for the make up of this ✂, but based on discussions with airlines and our review of additional material presented to the CAA, we have developed a clearer understanding of the issues faced by HAL.



The material presented to the CAA provides some justification for an overlay. Travelex experienced a ✂ decline in walk-up currency exchange transactions at Heathrow from 2015-2019.[1] The previous concession contract operated largely on a fixed payment basis, which has so far protected HAL from these broader market trends. We understand that this contract expired in 2020, and we also note that Travelex entered into administration in 2020. HAL argues that the renegotiated contract has far less generous terms and does not offer fixed payment protections. **Consequently, we find that the needs test for an overlay has been met.**

There has been a long-term decline in walk-up FX transactions and currency exchange more generally, with passengers favouring electronic payments and currency cards. Based on industry insights, we expect this trend to continue – with the airport currency exchange market under pressure from both the move away from cash, and savvier travellers making more effective use of online price comparisons.

As no explanation has been provided for the size of the ✂ overlay, we have developed an alternate set of assumption to test its efficiency. We assume the ✂ decline in walk-up transactions represents the longer term decline in currency exchange revenues, implying a 10% annual reduction. We then assume there is a step change in 2021 revenues to account for the cumulative reduction in income from 2014-2020 (when fixed payment protections expired), and that revenues from 2022 onwards decline with the same long-term trend.

This implies a reduction of 56% in 2022 rising to a 71% reduction in 2026, suggesting that HAL's estimate may be overstated.

% reduction from 2019 levels	2022	2023	2024	2025	2026
Currency exchange	-56%	-60%	-64%	-67%	-71%

Source: CEPA analysis

1. CAA session on commercial revenues in the RBP (4 December 2020)

Retail: CEPA Proposals - nominal

Retail: *Catering, Duty Free, Specialist Shops (HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	478.9	478.9	478.9	478.9	478.9
CPI increase, £m (%)	20.3 (4%)	29.7 (6%)	39.5 (8%)	49.9 (10%)	60.5 (13%)
Price adj. forecast, £m	499.2	508.6	518.4	528.8	539.4
Volume adjustment, £m (%)	-247.9 (-50%)	-155.5 (-31%)	-93.3 (-18%)	-61.8 (-12%)	-48.8 (-9%)
Volume adj. forecast, £m	251.2	353.1	425.1	467.0	490.6
Overlay, £m (%)	-30.9 (-12%)	-46.3 (-13%)	-57.8 (-14%)	-64.4 (-14%)	-68.5 (-14%)
Management stretch, £m (%)	13.5 (6%)	25.3 (8%)	38.2 (10%)	50.8 (13%)	62.8 (15%)
Final forecast, £m	**233.8**	**332.1**	**405.5**	**453.4**	**484.8**
HAL forecast, £m	✂	✂	✂	✂	✂
Difference with CEPA, £m	✂	✂	✂	✂	✂
Cumulative difference, £m					✂

Source: CEPA analysis

Bureaux *(HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	40.1	40.1	40.1	40.1	40.1
CPI increase, £m (%)	1.7 (4%)	2.5 (6%)	3.3 (8%)	4.2 (10%)	5.1 (13%)
Price adj. forecast, £m	41.8	42.6	43.4	44.3	45.2
Volume adjustment, £m (%)	-19.7 (-47%)	-12.6 (-30%)	-7.9 (-18%)	-5.6 (-13%)	-4.8 (-11%)
Volume adj. forecast, £m	22.1	30.0	35.5	38.7	40.4
Overlay, £m (%)	-12.3 (-56%)	-18.0 (-60%)	-22.7 (-64%)	-26.1 (-67%)	-28.5 (-71%)
Management stretch, £m (%)	0.6 (6%)	1.0 (8%)	1.3 (10%)	1.6 (13%)	1.8 (15%)
Final forecast, £m	**10.4**	**12.9**	**14.1**	**14.2**	**13.6**
HAL forecast, £m	✂	✂	✂	✂	✂
Difference with CEPA, £m	✂	✂	✂	✂	✂
Cumulative difference, £m					✂

Source: CEPA analysis

Section Four

Commercial revenue forecasts

D. Surface access

Surface Access: Summary of HAL's proposals – Narrative around forecasts

In their RBP and subsequent presentations, HAL has presented a series of headwinds and opportunities related to surface access. These broadly sit in three categories – the impact of the COVID-19 pandemic, the introduction of Crossrail services, and management initiatives to increase revenues.

The pandemic is expected to lead to some short-term structural shifts in how passengers travel to/from the airport and the types of passengers that use different surface access services.

- Change in passenger mix, with more leisure and short-haul passengers and fewer business and long-haul passengers:
  - This is assumed to lead to lower average transaction values (ATV) for HAL's car rental and car parking services
  - Less revenue from Heathrow Express
- Fewer passengers:
  - Less revenue from all surface access services
- A shift from public transport to private transport modes:
  - Less Heathrow Express revenue
  - More transactions from car rental and car parking

The introduction of **Crossrail services** is expected to lead to a step change in how passengers travel to the airport, with a shift from other transport modes to Crossrail.

- Transfer of passengers from Heathrow Express to Crossrail
  - Less rail revenue

HAL is considering several **management initiatives** that may lead to a step increase in surface access revenues.

- Using closed car parks for alternate purposes until demand returns:
  - Mitigating impact of lower volumes
- Terminal drop-off charge:
  - New revenue stream

Surface Access: Summary of HAL's proposals – real

Surface access: *Car parking and car rental*

2018 RPI prices	2022	2023	2024	2025	2026
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Overlay, £m (%)	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

- Volume adjustment linked to car park and car rental mode shares:

	2019	2020	2021	2022	2023	2024	2025	2026
Car parking	✂	✂	✂	✂	✂	✂	✂	✂
Car rental	✂	✂	✂	✂	✂	✂	✂	✂

- Unclear precise rationale for overlay, but assumed it relates to the narrative around average transaction values

Rail: *Heathrow Express and track access charges*

2018 RPI prices	2022	2023	2024	2025	2026
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Overlay, £m (%)	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

- Volume adjustment linked Heathrow Express mode share:

	2019	2020	2021	2022	2023	2024	2025	2026
HEx	✂	✂	✂	✂	✂	✂	✂	✂

  Terminal drop off charge increases mode share by ✂ and Crossrail services reduce mode share by ✂

- Overlay accounts for impact on rail yields:
  - ✂ COVID-19 related
  - ✂ Crossrail related

Surface Access: Summary of HAL's proposals – nominal

Surface access: *Car parking and car rental*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	✂	✂	✂	✂	✂
RPI increase, £m (%)	✂	✂	✂	✂	✂
Price adj. forecast, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Overlay, £m (%)	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

Rail: *Heathrow Express and track access charges*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	✂	✂	✂	✂	✂
RPI increase, £m (%)	✂	✂	✂	✂	✂
Price adj. forecast, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Overlay, £m (%)	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

Surface Access: Impact of mode share assumptions

HAL's description of its methodology for producing the mode share forecasts has not been fully spelled out and as a result, we have had to make some inferences about the approach taken. The chart below shows HAL's mode share assumptions in the original RBP. We understand the mode share assumptions have been developed using outputs from HAL's LASAM model and a set of off-model assumptions and adjustments, separately capturing (1) pandemic related effects, (2) the impact of the terminal drop-off charge (previously called the Forecourt Access Charge), and (3) the impact of Crossrail services being introduced.

We believe the main driver of HAL's forecasts are the off-model assumptions used to estimate structural shifts in mode share as a result of the COVID-19 pandemic - (1) above. We believe these are assumptions-based as opposed to being derived from the LASAM model, as the model is not set up to evaluate structural shifts in demand or passenger preferences. The LASAM model estimates the mode share of passengers travelling to and from the airport, given travel distances, journey times, travel cost, and observed (historical) preferences for certain modes. It assumes preferences, price elasticities and time elasticities, all remain fixed.

We believe HAL's 2020 mode share assumptions reflect its view of 'peak' pandemic related effects on mode share, with mode shares eventually returning to 2019 levels by 2024. We also understand actual data from 2020 has been used to inform HAL's estimates of 2020 mode share, but it is unclear how this information has been incorporated. We know HAL's original RBP had access to two months of actual mode share data (July and August 2020), but it is not clear whether more mode share data has been captured since then.

Mode share (%) for Heathrow Airport OD passengers

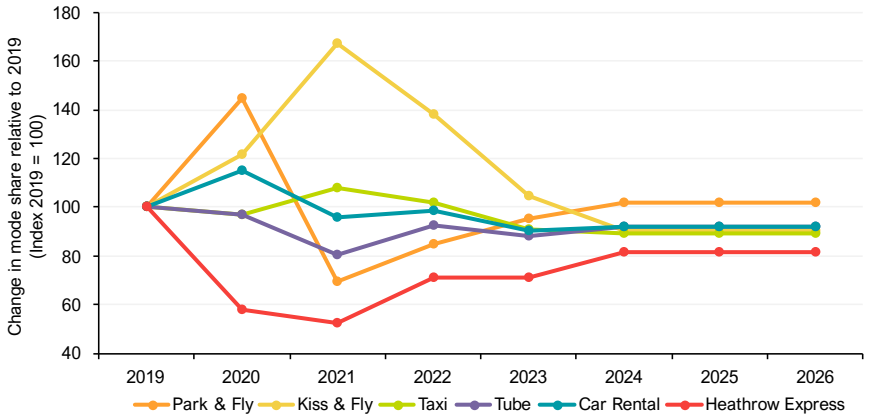
Source: HAL presentation to CAA

Surface Access: Impact of mode share assumptions

We believe the LASAM model has been used to estimate the impact of the terminal drop-off charge and the impact of introducing Crossrail services (shown in the table right). Based on our understanding of the model, it is designed to assess the impact of changes in pricing, journey time, and accessibility. As a result, it is well suited to assess the impact of the terminal drop-off charge (which affects pricing) and the impact of Crossrail services (which affects journey time and accessibility).

Based on the narrative provided by HAL, we believe HAL has made some further adjustments to maintain the Heathrow Express market share during the pandemic and following the introduction of Crossrail services. HAL separately includes two overlays to account for a reduction in yield from Heathrow Express (see subsequent slides). HAL states that a reduction in Heathrow Express ticket prices is necessary to maintain market share in response to the two headwinds (see chart on previous slide). However, no analysis has been presented to explain how this reduction in yield interacts with the mode share results from LASAM.

Change in mode share relative to 2019: RBP Update 1



The chart left shows HAL's mode share assumptions in Update 1 of the RBP:

- We do not know whether the Heathrow Express mode shares account for the reduction in ticket price assumed in the overlays.
- We also do not know why Park and Fly passenger volumes experience a substantial reduction in 2021, not experienced by other similar modes such as Kiss & Fly

Table 17: Mode share assumptions

Source: CEPA analysis of HAL RBP model

Surface Access: Impact of mode share assumptions – CEPA proposals

Our approach to developing mode share estimates broadly matches HAL's methodology. However, we have attempted to replicate it as transparently as possible to allow HAL to challenge any specific assumptions they disagree with.

- We assume that HAL's 2020 mode share assumptions are largely based on actual survey data (while recognising that passengers were not surveyed in April to June 2020). We also assume the changes in mode share between 2019 and 2020 is reflective of the impact of the COVID-19 pandemic. Ideally, our 'peak pandemic effect' assumption would be based on survey data from just the pandemic months (i.e. July 2020 onwards) but we do not have access to such data.
- In line with HAL's assumptions, we assume mode shares return to normal (2019 levels) by 2024. This is before we account for other changes such as the terminal drop-off charge.
- Finally, we apply as overlays, the impact of the terminal drop-off charge and the introduction of Crossrail services on mode shares, as per HAL's assumptions on the previous slide.
- **Below we present a comparison of our mode share assumptions with HAL's**

HAL mode share assumptions

	2019	2020	2022	2023	2024	2025	2026
Park & Fly	✂	✂	✂	✂	✂	✂	✂
Kiss & Fly	✂	✂	✂	✂	✂	✂	✂
Taxi	✂	✂	✂	✂	✂	✂	✂
Bus / Coach	✂	✂	✂	✂	✂	✂	✂
Tube	✂	✂	✂	✂	✂	✂	✂
Car Rental	✂	✂	✂	✂	✂	✂	✂
Heathrow Express	✂	✂	✂	✂	✂	✂	✂
TfL Rail / Crossrail	✂	✂	✂	✂	✂	✂	✂
Other	✂	✂	✂	✂	✂	✂	✂

Source: HAL RBP model

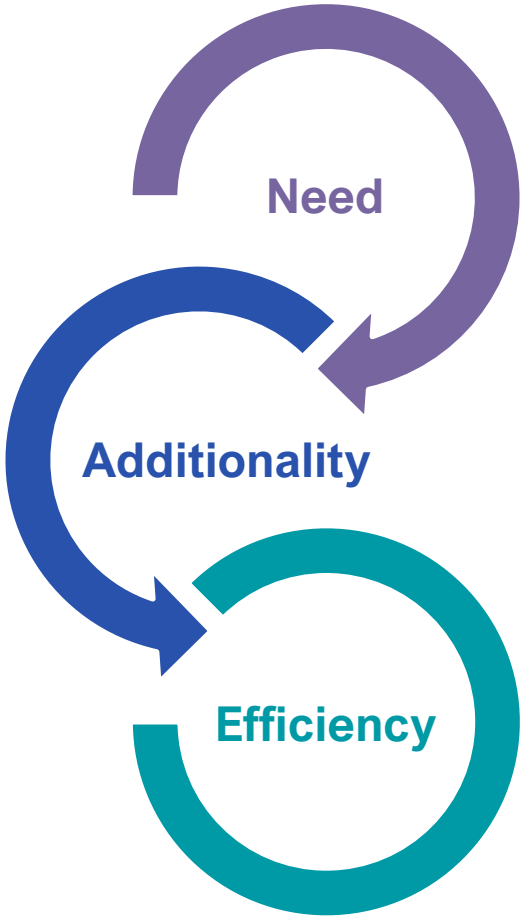
CEPA mode share assumptions

2022	2023	2024	2025	2026
9.2%	8.2%	7.2%	7.3%	7.3%
18.9%	17.5%	16.0%	15.9%	15.9%
29.2%	28.3%	27.4%	27.2%	27.2%
11.1%	11.3%	11.5%	11.5%	11.5%
20.0%	19.1%	18.3%	18.4%	18.4%
2.2%	2.0%	1.9%	1.9%	1.9%
6.9%	7.0%	7.0%	7.1%	7.1%
1.2%	5.5%	9.8%	9.8%	9.8%
1.2%	1.1%	1.1%	1.1%	1.1%

Source: CEPA analysis

Surface Access: Covid-overlay to parking and rental income

HAL state that the pandemic will affect the average revenue they receive from a typical car parking or car rental transaction. They apply an overlay of ✂ in 2022 and ✂ in 2023 to reflect the impact on revenues.



HAL do not precisely state the rationale for the overlay to car parking and car rental income, though we infer it relates to a change in the passenger mix. In other words, changes to the passenger mix mean that HAL are not able to extract as much revenue from an average car parking or car rental customer. There is a logic to average transaction values (ATV) reducing as a result of changes in the ratio of business to leisure passengers. However, HAL has not provided any elaboration of the size of the reduction in ATVs.

HAL assume that the car parking and car rental mode share will be lower in 2022 and 2023 relative to 2019 (implying fewer transactions) and that the ATV will also reduce. We are not convinced that these two effects are genuinely additional. It is not clear why the two effects would happen simultaneously, especially when we would expect the pandemic and terminal drop-off charge to lead to higher demand for car parking and car rental products.

We can not determine the efficiency of HAL's proposed adjustment as there are key gaps in the logic and evidence underpinning the overlay assumptions. However, as we have already adjusted our mode share assumptions, we do not also make an efficiency adjustment to the COVID-19 overlay.

Surface Access: Covid-19 overlay to rail

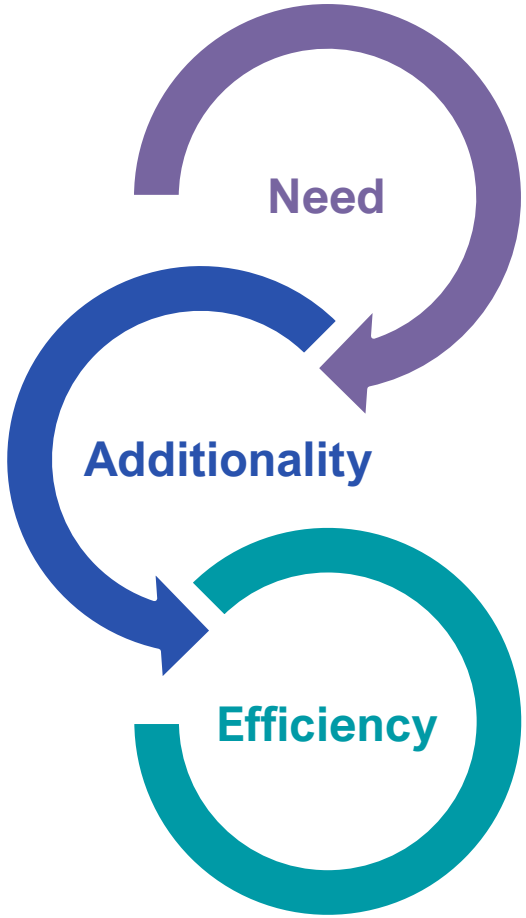
HAL has proposed two separate adjustments related to the COVID-19 pandemic. The first is the reduction in Heathrow Express (HEx) mode share (a 'volume' effect), which we discuss earlier. The second is the reduction in yield required to maintain market share (a 'price' effect), which has been incorporated into HAL's forecasts as a separate overlay.

- HAL assumes a ✂ reduction in yield from 2021 onwards (which we assume comes from a ✂ reduction in price) as a reaction to the pandemic.
  - The source of this assumption has not been explained, nor has its impact on the HEx mode share been transparently presented.
  - This overlay is applied for the whole H7 period, though we would expect the overlay to reduce over time as the effect of the pandemic fades (as assumed in HAL's mode share analysis).

We do not think the needs case has been met in this instance. The impact of the ✂ reduction in average ticket prices on HEx's mode share, assuming this is the reason for the yield reduction, is not clearly presented – and as such, we do not have access to any evidence to suggest that such a reduction in price is either necessary or efficient. This is also consistent with our mode share assumptions, where we do not assume any reduction in the HEx ticket price. We would like HAL to provide evidence showing how it determined a ✂ reduction in yields/ticket prices is the most appropriate response to pandemic-induced changes to demand, and what the mode share impacts are expected to be. Most importantly, we would like to see evidence that reducing ticket prices is the revenue maximising response to a reduction in mode share.

Surface Access: Crossrail-overlay to rail

HAL has also proposed two separate adjustments related to Crossrail. The first is the reduction in Heathrow Express (HEx) mode share (a 'volume' effect), and the second is the reduction in yield required to maintain market share (a 'price' effect).



Crossrail services will inevitably abstract passengers and associated revenues from other transport modes. And we would expect HEx services to be more affected than other transport modes given the overlap in routes.

We understand the logic underpinning a yield / price reduction in addition to a mode share / volume reduction, given a reduction in price may be a revenue maximising strategy in response to the introduction of Crossrail services. **As such, we consider the needs test has been met for this overlay.**

It is not clear whether the effect of reducing ticket prices on mode share has been factored into HAL's forecasts. HAL's mode share assumptions imply there would be a much larger impact on passenger volumes in the absence of any price reduction. As such, we can not confirm that the overlay is genuinely additional to the volume-based effects. Nevertheless, we understand that the volume and price effects are two distinct impacts.

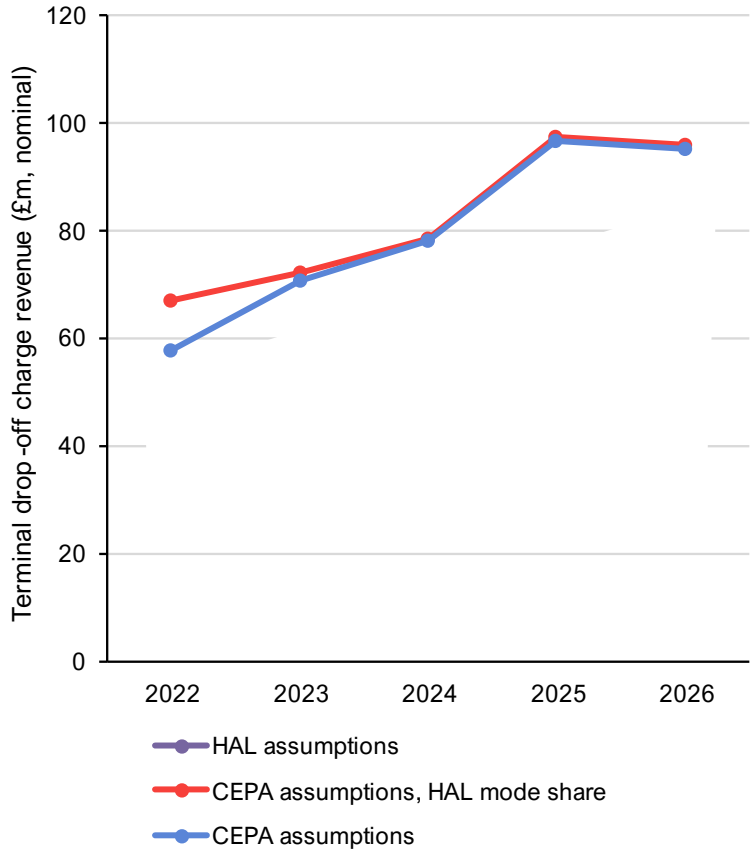
HAL assumes a ✂ reduction in yield (which we assume comes from a ✂ reduction in price) as a reaction to Crossrail. The source of this assumption has not been explained, but compares favourably to HAL's assumption from iH7 where there was an ✂ assumed reduction in yield.

The combined effect of the volume-effect and price effect assumptions is a ✂ reduction in rail revenue. This broadly matches HAL's assumption from iH7, which assumed a ✂ reduction in rail revenue (albeit with a different split between volume reductions and price reductions).

However, we understand that roughly 20% of HAL's rail income relates to track access charges – these are governed by a different arrangement that is not linked to volumes. We are also not aware of higher track access income from additional Crossrail services being captured as a mitigation. **As a result, we use the same overlay as HAL, but apply it only to the proportion of revenue that does not relate to track access.**

Surface Access: Terminal Drop-off Charge

Comparison CEPA terminal drop-off charge revenue estimates with HAL's estimates



Source: CEPA analysis, HAL RBP model

The terminal drop-off charge proposed by HAL will be introduced in Q3 2021 and applied to Kiss & Fly and Taxi trips. In their most recent RBP update, HAL proposes a £5 (nominal) charge for the first three years, rising to £6 (nominal) by 2026:

- Mode shares are taken from LASAM
- Vehicle occupancy rates are taken from LASAM and historic experience, but the specific assumption has not been provided
- HAL assume ✂, and a gradual improvement in compliance.

We have tried to recreate HAL's analysis using HAL's own assumptions where stated and publicly available assumptions where not stated.

- We assume average passenger vehicle occupancy of 1.5.[1]
- In line with HAL's assumptions, we assume ✂ are exempt and ✂ are undetected, with the remainder required to pay. We then follow HAL's assumptions around compliance and penalty charges for non-compliance.
- The result is substantially higher revenue forecasts than HAL's forecasts, though without access to HAL's underlying workings it is unclear which assumptions are driving the differences.

To ensure consistency with our mode share assumptions, we use our mode share estimates for the Terminal Drop-off Charge overlay.

1. Jacobs (2014) Appraisal Framework Module 4. Surface Access: Heathrow Airport North West Runway. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/371829/4-surface-access--lhr-nwr.pdf

Surface Access: CEPA Proposals - nominal

Surface access: *Car parking and car rental (HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	147.1	147.1	147.1	147.1	147.1
CPI increase, £m (%)	6.2 (4%)	9.1 (6%)	12.1 (8%)	15.3 (10%)	18.6 (13%)
Price adj. forecast, £m	153.4	156.3	159.3	162.5	165.7
Volume adjustment, £m (%)	-53.6 (-35%)	-33.0 (-21%)	-29.3 (-18%)	-18.5 (-11%)	-15.7 (-9%)
Volume adj. forecast, £m	99.8	123.3	130.0	143.9	150.0
Overlay, £m (%)	-6.8 (-7%)	-2.2 (-2%)	0.0 (0%)	0.0 (0%)	0.0 (0%)
Management stretch, £m (%)	5.7 (6%)	10.0 (8%)	13.5 (10%)	18.2 (13%)	22.3 (15%)
Final forecast, £m	**98.7**	**131.1**	**143.5**	**162.1**	**172.3**
HAL forecast, £m	✂	✂	✂	✂	✂
Difference with CEPA, £m	✂	✂	✂	✂	✂
Cumulative difference, £m					✂

Source: CEPA analysis

Rail: *Heathrow Express and track access charges (HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	139.2	139.2	139.2	139.2	139.2
CPI increase, £m (%)	5.9 (4%)	8.6 (6%)	11.5 (8%)	14.5 (10%)	17.6 (13%)
Price adj. forecast, £m	145.1	147.9	150.7	153.7	156.8
Volume adjustment, £m (%)	-71.1 (-49%)	-53.8 (-36%)	-42.2 (-28%)	-36.5 (-24%)	-35.0 (-22%)
Volume adj. forecast, £m	74.0	94.1	108.5	117.3	121.8
Overlay, £m (%)	0.0 (0%)	0.0 (0%)	-11.0 (-10%)	-12.1 (-10%)	-12.6 (-10%)
Management stretch, £m (%)	4.5 (6%)	7.8 (8%)	10.1 (10%)	13.3 (13%)	16.2 (15%)
Final forecast, £m	**78.6**	**101.8**	**107.7**	**118.5**	**125.5**
HAL forecast, £m	✂	✂	✂	✂	✂
Difference with CEPA, £m	✂	✂	✂	✂	✂
Cumulative difference, £m					✂

Source: CEPA analysis

Section Four

Commercial revenue forecasts

E. Property

Property: Summary of HAL's proposals – Narrative around forecasts

In their RBP and subsequent presentations, HAL has presented a series of headwinds and opportunities related to property revenues.

HAL expects that the **COVID-19 pandemic** leads to some long-term and short-term effects in their ability to generate property revenues:

- In the **short-term**, HAL's closure of certain terminals reduces the property revenue they receive. HAL uses a revenue elasticity with respect to utilised terminal space to account for this and assumes (in its mid scenario) that it can re-open all terminal space by 2024.
- In the **longer term**, HAL assumes property revenues will be lower, due to less demand for office space – from sector wide reductions, airline consolidations, and new working practices (e.g. agile working).
    - HAL applies a percentage overlay to account for the impact of COVID-19 on longer term working practices and tenants' requirements for infrastructure and office space.*

HAL's percentage overlay also accounts for **changes in guide prices** for 2021 and 2022, which may cause a substantial reduction in rental income in subsequent years.

HAL has identified the following **management initiatives** to mitigate the effect of COVID-19 on property revenues:

- *Space Optimisation projects:* the development of small-format retail units, offering consumers complementary essentials products in a single unit
- *Maximise occupancy and rental income:* re-letting and targeting investments for the refurbishment and creation of spaces suitable for reletting
- *Developing passenger focused facilities:* property provides several passenger facing products, for example terminal connected hotels, independent lounges, and business centres
- *Long Term Operational Facilities:* HAL considers the purchase of essential operational leased buildings where it drives a lower long-term facilities cost

*Note: HAL will be revising the COVID-19 adjustment factor for RBP updates in 2021

Property: Summary of HAL's proposals

Property: *office space, lounges, non-terminal properties and cargo*

2018 RPI prices	2022	2023	2024	2025	2026
Baseline, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Overlay, £m (%)	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

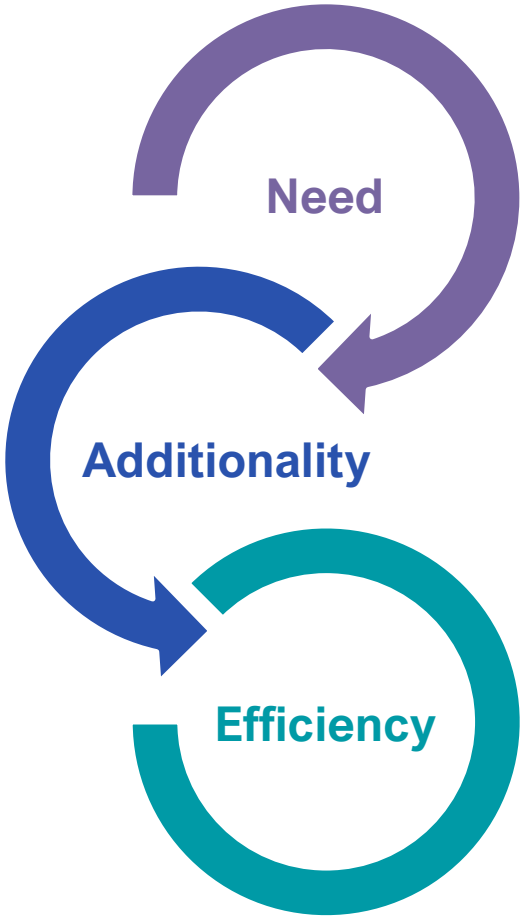
- Volume adjustment linked to property revenues:
  - HAL uses utilised terminal space as a driver for revenue forecast: for every 1% increase in passengers, retail revenue will increase by ✂
  - Compared to 2019, utilised terminal space is assumed to be ✂ lower in 2022 and ✂ lower in 2023
  - ✂
- Overlay for impact on property revenue accounts for:
  - The impact of COVID-19
  - The change in rental guide prices for 2021 and subsequent years
  - Assumed to be ✂ for entire H7

Property: *office space, lounges, non-terminal properties and cargo*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	✂	✂	✂	✂	✂
RPI increase, £m (%)	✂	✂	✂	✂	✂
Price adj. forecast, £m	✂	✂	✂	✂	✂
Volume adjustment, £m (%)	✂	✂	✂	✂	✂
Volume adj. forecast, £m	✂	✂	✂	✂	✂
Overlay, £m (%)	✂	✂	✂	✂	✂
Final forecast, £m	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

Property: Efficient overlay adjustment



There is a logic to allow for an overlay for the impact of COVID-19 and the rental price guide adjustment on property revenues. We understand office space will be in lower demand and tenants' requirements for infrastructure will change. However, HAL has not provided any elaboration of the size of the overlay.

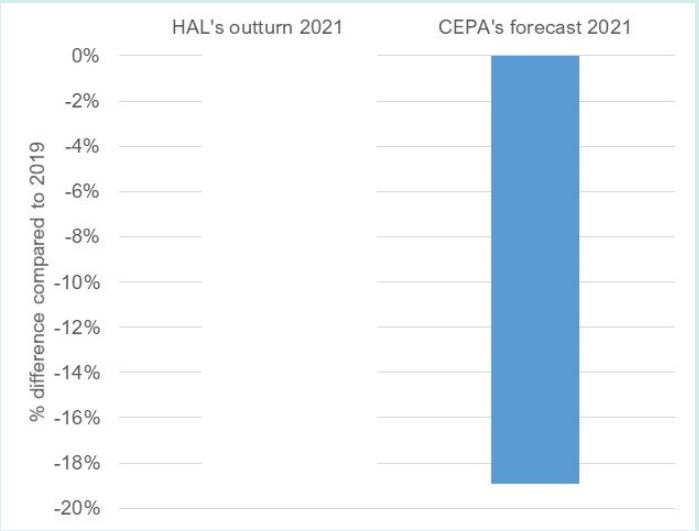
The effect of COVID-19 and the change in rental price guidance on property revenues is not appropriately captured when forecasting revenues using utilised terminal space elasticities. As a result, we agree there is need for an overlay to adjust for the impacts of COVID-19.

HAL has not provided any workings to explain the size of the ✂ overlay. To test the efficiency of the assumption, we compare 2021 forecast property revenue with outturn revenue in Q1 2021. In its investor report, HAL notes that property revenue has decreased by 18.4% due to targeted rental alleviation in Q1 2021 compared to Q1 2020 (which implies an 18.4% decrease compared to pre-COVID-19 levels). [1]

If we use HAL's elasticity of ✂ and the ✂ overlay to forecast 2021 revenues, there is a total reduction of 25% relative to 2019 levels, which is greater than the Q1 2021 outturn. However, using CEPA's proposed elasticity of 0.25 implies a total reduction of 18.9%, which is much closer to HAL's outturn reduction in Q1 2021.

As such, we conclude that HAL's overlay assumption is broadly appropriate when combined with our elasticity assumption.

Property 2021 outturn and forecast comparison



Source: CEPA analysis

1. Heathrow (2021), Investor Report June 2021

Property: CEPA Proposals - nominal

***Property** (HAL mid pax forecasts)*

Nominal	2022	2023	2024	2025	2026
Baseline, £m	133.8	133.8	133.8	133.8	133.8
CPI increase, £m (%)	5.7 (4%)	8.3 (6%)	11.0 (8%)	13.9 (10%)	16.9 (13%)
Price adj. forecast, £m	139.5	142.1	144.9	147.8	150.7
Volume adjustment, £m (%)	-6.5 (-5%)	-2.8 (-2%)	0.0 (0%)	0.0 (0%)	0.0 (0%)
Volume adj. forecast, £m	133.0	139.4	144.9	147.8	150.7
Overlay, £m (%)	-17.3 (-13%)	-18.1 (-13%)	-18.8 (-13%)	-19.2 (-13%)	-19.6 (-13%)
Management stretch, £m (%)	7.1 (6%)	10.0 (8%)	13.1 (10%)	16.2 (13%)	19.5 (15%)
Final forecast, £m	**122.8**	**131.3**	**139.2**	**144.8**	**150.6**
HAL forecast, £m	✂	✂	✂	✂	✂
Difference with CEPA, £m	✂	✂	✂	✂	✂
Cumulative difference, £m					✂

Source: CEPA analysis

Section Four

Commercial revenue forecasts

F. Other non-aeronautical revenues

Service revenue

Service revenue includes commercial revenue from other areas, with HAL listing areas such as the Fast Track service, VIP charges, and aviation fuel.

The key differences between HAL's forecasts and ours are as follows:

- As discussed in the elasticities section, we apply an elasticity of 0.8 with respect to passenger numbers rather than HAL's proposal of ✂.
- We also assume revenues increase by CPI rather than RPI.
- Finally, we apply a 2% management challenge adjustment each year from 2020.

HAL forecasts: *Service revenue*

			2019	2022	2023	2024	2025	2026
HAL forecasts	2018 RPI prices	**2019 baseline**	52.8					
		Forecast		✂	✂	✂	✂	✂
	Nominal	**Forecast**		✂	✂	✂	✂	✂
CEPA forecasts	Nominal	**Forecast**		36.6	47.1	55.0	60.4	64.0

Source: CEPA analysis, HAL RBP model

Section Four

Commercial revenue forecasts

G. Cargo revenues

Cargo: Our review of HAL's proposals

Heathrow has a strong share of the cargo market, with 40% of UK exports and 62% of airfreight exports in 2019.[1]

- HAL experienced a 650% increase in cargo revenues between 2019 and 2020.[2] With the fall in passenger numbers from COVID-19, and the continued effect of this in coming years as numbers recover, cargo revenue will take an even more important role than previously.
- Heathrow Airport was not successful in its bid for freeport status (the successful bids were announced in May 2021).[2] Had it been successful, there would have been structural changes to cargo revenue requiring a more significant update.
- Whether or not it had been successful in reaching freeport, we would have expected more detail on cargo revenue in HAL's RBP. Cargo revenue was not discussed in either the original RBP submission or in the July 2021 update (Update 1).
- Based on the information presented in the RBP model, we understand HAL's forecast to be as follows. HAL forecasts cargo revenue using an elasticity of ✂ with respect to passenger numbers. It does not apply any overlays or other adjustments.

(£m, nominal)	2019	2022	2023	2024	2025	2026
Passengers vs 2019 baseline	-	✂	✂	✂	✂	✂
Cargo revenue (HAL forecast)	✂	✂	✂	✂	✂	✂

Source: CEPA analysis of HAL RBP model

We do not consider an elasticity of ✂ to be appropriate.

- This would imply cargo revenue of approximately ✂ for each of 2020 and 2021, whereas outturn revenue was £76m in 2020 and HAL assume cargo revenue in 2021 will be ✂. Additionally, between 2017 and 2019 both passenger numbers and cargo revenue increased, suggesting that in 'normal times' (i.e. once the COVID-19 impact has gone) a negative relationship with passenger numbers might not be appropriate. [3]
- Additionally, we note that HAL plans to invest £25m in capex over H7 to improve its cargo offering.[4] The impact of this investment has not been explicitly captured in HAL's forecasts. HAL states that it expects the £25m in capex to be returned within ✂ years – over which time passenger growth is also expected. While this may include some cost savings, it is clear that it is looking to increase cargo revenue relative to the 2019 baseline – e.g. improvements that will allow faster flows of cargo through the airport.

1. HAL RBP Section 7.2 – Commercial Revenues
2. HAL Response to CAP 2139 para 114
3. HAL RBP model (Update 1)
4. H7 RBP Update 1, Section 5.5 - Commercial Revenues Update

Cargo: CEPA proposal

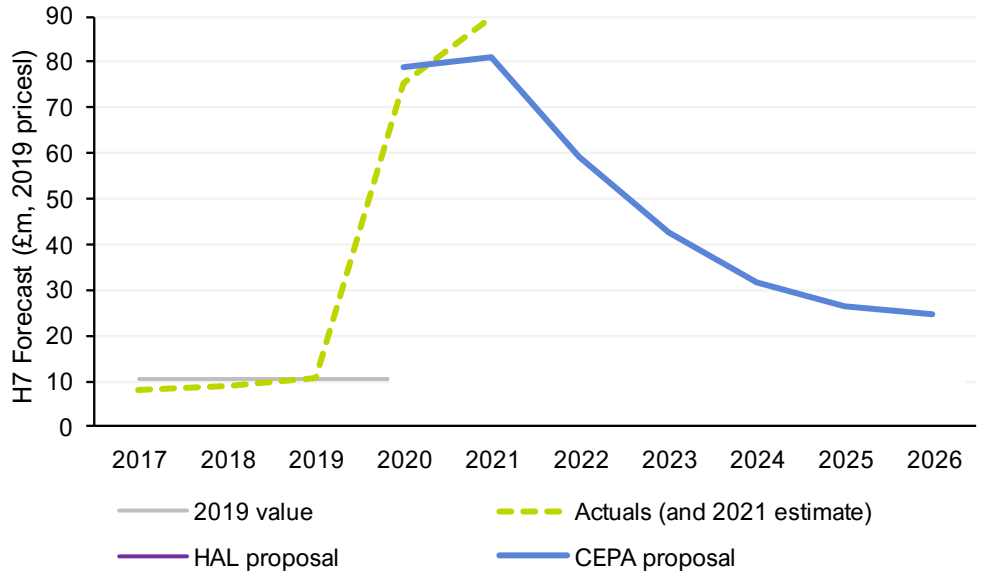
Given the issues outlined in the previous slide, we present an alternate set of assumptions:

- HAL has provided us with actual cargo revenues for 2020 and their forecast for 2021. We use these figures to estimate an elasticity – working out the elasticity required to match these figures given passenger volumes for these two years, and given our 2% management stretch estimate. This results in us applying **an elasticity of -8.50 with respect to passenger numbers**. While not a long-term view of the relationship, this elasticity broadly matches the short-term relationship between passenger volumes and cargo revenue in 2020 and 2021.
- We also note that HAL has proposed a £25.4m investment in its cargo offering, with a 14 year payback. Assuming an increase in revenue from year three (2024) for twelve years, and using HAL's proposed WACC to approximate the IRR, we estimate that there would be an additional £3.5m cargo revenue per year. We assume this impact would be captured within the management challenge estimate.

Historical and forecast cargo revenues *(HAL mid pax forecasts)*

£m, nominal	2020	2021	2022	2023	2024	2025	2026
2019 value	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Actuals	75.5	✂					
HAL forecast	✂	✂	✂	✂	✂	✂	✂
CEPA forecast	80.6	84.2	62.0	45.1	33.9	28.6	27.3

Source: HAL Updated RBP and CEPA analysis



Source: CEPA analysis, HAL RBP model

Section Four

Commercial revenue forecasts

H. Capital investment

Capital investment: Summary of HAL's proposals

HAL proposes two capital plans, a Safety Only plan (full RAB adjustment) and an Optimal plan (no RAB adjustment). HAL claims that, absent of the optimal plan investments, there would be a reduction in commercial revenues of £192m (2018 RPI prices).

HAL's Safety Only capital plan (£100m)

- CRM and loyalty systems
- Advertising screens and other media assets
- Car park payment machines
- HEx train replacements
- VIP suite assets
- Surface access assets, including car parks

Plan	H7 investment (£m, 2018 RPI prices)					Total H7
	2022	2023	2024	2025	2026	
Safety Only	10	25	25	20	20	100
Optimal	10	70	160	170	190	600

Source: HAL RBP

HAL's Optimal capital plan (£100m + £600m)

- *Property*: opportunities to drive revenue through development of HAL's estate
- *Surface Access (asset replacement)*: replace parking assets.
- *Surface access (Electrification & development)*: Car park optimisation and consolidation work, along with the provision of EV charging
- *Retail & media*: range of initiatives to develop retail space and digital media
- *Digital transformation*: range of investments to develop eCommerce capability
- *Cargo*: HAL claims that this does not drive revenue directly, and so a long payback period has been assumed

In the following slides, we consider the potential for commercial revenue benefits to arise from each element of the Capital Plan.

Capital investment: HAL's proposal

Area	H7 investment and payback (2018 RPI)	HAL's plans	Revenue generation
Commercial Property Development	£200m (9 years)	**Property development:** Redeveloping one of the business parks to potentially double the lettable floor space, changing the use of farmland subject to planning consent, relocating one of the control facilities for redevelopment for operational and / or commercial use and opportunities to redevelop sites in the Central Terminal Area.	No revenue generation assumed in H7.
Surface Access Asset Replace.	£192m (15 years)	**MSCP4:** One of the key car parks will come to the end of life in the H7 period. The proposed investment will futureproof the carpark for 50 years.	Based on its forecast model, HAL assumes ✂ additional revenue compared to Safety Only plan.
Surface Access Electrification	£65m (2 years)	**Car park optimisation:** investment in alternative uses for car park if passenger demand does not return until later in H7.	
Retail & Media Development	£63m (5 years)	**Back of house optimisation:** Optimise back of house areas to develop appropriate space for storage and dwell and anticipate that more retail products could be purchased and delivered through buy and collect. **Space strategy:** This includes repurposing Bureau/VAT Refund units due to the decline in physical transactions and rolling out the 'Blended Essentials' concept after a successful trial in T2. **Other initiatives:** considering reinvigorating the 'end of life' VIP and premium service facilities, through refurbishing the Windsor Suite. If these initiatives commence when anticipated, they will all payback and provide commercial revenue in H7.	HAL claims that the other initiatives and the back of house optimisation work in 2022 would benefit from a payback throughout the H7 period from higher retail revenues. HAL assumes ✂ additional revenue compared to Safety Only capital plan in H7.
Cargo Development	£25m (15 years)	**Truck call-forward facility and traffic management system:** this facility would reduce congestion on landside roads, improve safety of the on-airport cargo estate and bring sustainability benefits for the local community. **Airside trans-shipment facility:** HAL are working with Government to seek modification to historical operating procedures that currently do not permit cargo to be connected airside.	No revenue generation assumed in H7.

Source: HAL RBP

Capital investment: Our view

H7 (£m, 2018 RPI prices)	2022	2023	2024	2025	2026	H7	HAL's assumption	Our view
Commercial Property Development			67	67	67	**200**	HAL assumes ✂ generation in H7	We consider it likely that this investment will generate revenue in the long run. However, as HAL propose to only make these investments in the latter part of H7 (2024-26), we consider it unlikely to generate significant revenue in H7.
Surface Access Asset Replacement			52	64	76	**192**	HAL assumes ✂ additional revenue in H7	As investment in alternative uses for car parks, will protect commercial revenue streams, it is likely that this will generate additional revenue in H7.
Surface Access Electrification & dev.	2	24	14	12	13	**65**		
Retail & Media Development	3	23	14	12	11	**63**	HAL assumes ✂ additional revenue in H7	We agree with HAL that the other initiatives and the back of house optimisation work in 2022 would benefit from a payback throughout the H7 period from higher retail revenues.
Cargo Development	2	13	3	3	5	**25**	HAL assumes ✂ generation in H7	This is likely to generate some revenue in H7. It is clear that HAL is looking to increase cargo revenue relative to the 2019 baseline.

Source: CEPA analysis, HAL RBP model

Based on HAL's commercial revenue forecasts, it claims that the optimal plan will generate additional revenue for retail, rail and surface access. Our view is that Cargo investments are also likely to generate revenue in H7. We have assumed this effect is captured within our management challenge allowance.

Section Four

Commercial revenue forecasts

I. Overall results

Commercial Revenues: Summary

HAL forecasts: *HAL mid pax forecasts, No RAB Adjustment*

Nominal, £m	2022	2023	2024	2025	2026
Retail excl. Bureaux	✂	✂	✂	✂	✂
Bureaux	✂	✂	✂	✂	✂
Surface access	✂	✂	✂	✂	✂
Service excl. surface access	✂	✂	✂	✂	✂
Property	✂	✂	✂	✂	✂
Rail	✂	✂	✂	✂	✂
Other	✂	✂	✂	✂	✂
Terminal drop-off charge	✂	✂	✂	✂	✂
Red terminal revenue (HMT)	✂	✂	✂	✂	✂
Minimal capex overlay	✂	✂	✂	✂	✂
Total	**484**	**613**	**715**	**779**	**806**
Total per passenger, £	11.66	10.91	10.89	11.07	11.19

Source: HAL Analysis

Notes:
- HAL and CEPA revenue forecasts are reported on a consistent HAL Mid pax forecast scenario.
- The Retail excl. Bureaux lines have been taken from HAL's model rather than the RBP Update 1 Commercial revenues chapter. Over the H7 period, the Retail revenue forecasts are approximately ✂ higher in the model than in the chapter.

Cargo, £m	✂	✂	✂	✂	✂

Source: HAL Analysis

CEPA forecasts: *HAL mid pax forecasts, No RAB Adjustment*

Nominal, £m	2022	2023	2024	2025	2026
Retail excl. Bureaux	234	332	405	453	485
Bureaux	10	13	14	14	14
Surface access	99	131	143	162	172
Service excl. surface access	37	47	55	60	64
Property	123	131	139	145	151
Rail	79	102	108	119	125
Other	1	1	1	1	1
Terminal drop-off charge	58	71	78	97	95
Red terminal revenue (HMT)	17	7	0	0	0
Minimal capex overlay	0	0	0	0	0
Total	**657**	**835**	**944**	**1,051**	**1,108**
Total per passenger, £	15.80	14.86	14.39	14.94	15.38

Difference with HAL, £m	**173**	**222**	**229**	**272**	**302**
Cumulative difference, £m					**1,197**
Cumulative difference excl. capex overlay, £m					**972**

Cargo, £m	62	45	34	29	27

Source: CEPA Analysis

Commercial Revenues: Summary

HAL forecasts: *HAL mid pax forecasts, No RAB Adjustment*

2018 RPI, £m	2022	2023	2024	2025	2026
Retail excl. Bureaux	✂	✂	✂	✂	✂
Bureaux	✂	✂	✂	✂	✂
Surface access	✂	✂	✂	✂	✂
Service excl. surface access	✂	✂	✂	✂	✂
Property	✂	✂	✂	✂	✂
Rail	✂	✂	✂	✂	✂
Other	✂	✂	✂	✂	✂
Terminal drop-off charge	✂	✂	✂	✂	✂
Red terminal revenue (HMT)	✂	✂	✂	✂	✂
Minimal capex overlay	✂	✂	✂	✂	✂
Total	**442**	**546**	**618**	**653**	**656**
Total per passenger, £	10.63	9.71	9.41	9.28	9.11

Source: HAL Analysis

Notes:
- HAL and CEPA revenue forecasts are reported on a consistent HAL Mid pax forecast scenario.
- The Retail excl. Bureaux lines have been taken from HAL's model rather than the RBP Update 1 Commercial revenues chapter. Over the H7 period, the Retail revenue forecasts are approximately ✂ higher in the model than in the chapter.

Cargo, £m	✂	✂	✂	✂	✂

Source: HAL Analysis

CEPA forecasts: *HAL mid pax forecasts, No RAB Adjustment*

2018 RPI, £m	2022	2023	2024	2025	2026
Retail excl. Bureaux	215	298	354	384	399
Bureaux	10	12	12	12	11
Surface access	91	118	125	137	142
Service excl. surface access	34	42	48	51	53
Property	113	118	121	123	124
Rail	72	91	94	100	103
Other	1	1	1	1	1
Terminal drop-off charge	53	63	68	82	78
Red terminal revenue (HMT)	16	6	0	0	0
Minimal capex overlay	0	0	0	0	0
Total	**603**	**749**	**825**	**891**	**912**
Total per passenger, £	14.51	13.33	12.56	12.67	12.66

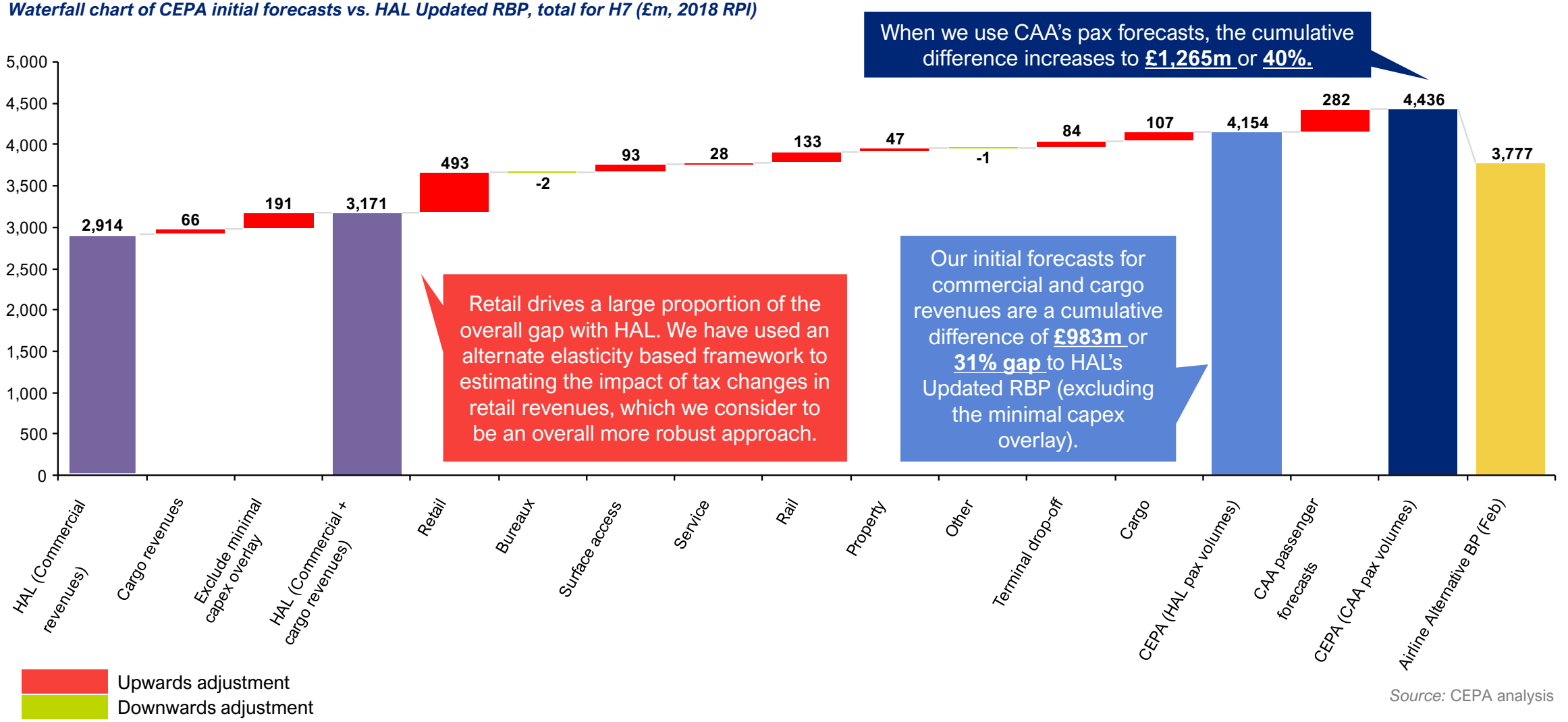
Difference with HAL, £m	**161**	**204**	**207**	**238**	**256**
Cumulative difference, £m					**1,066**
Cumulative difference excl. capex overlay, £m					**875**

Cargo, £m	57	40	30	24	22

Source: CEPA Analysis

Comparison of HAL and CEPA revenue forecasts

Waterfall chart of CEPA initial forecasts vs. HAL Updated RBP, total for H7 (£m, 2018 RPI)

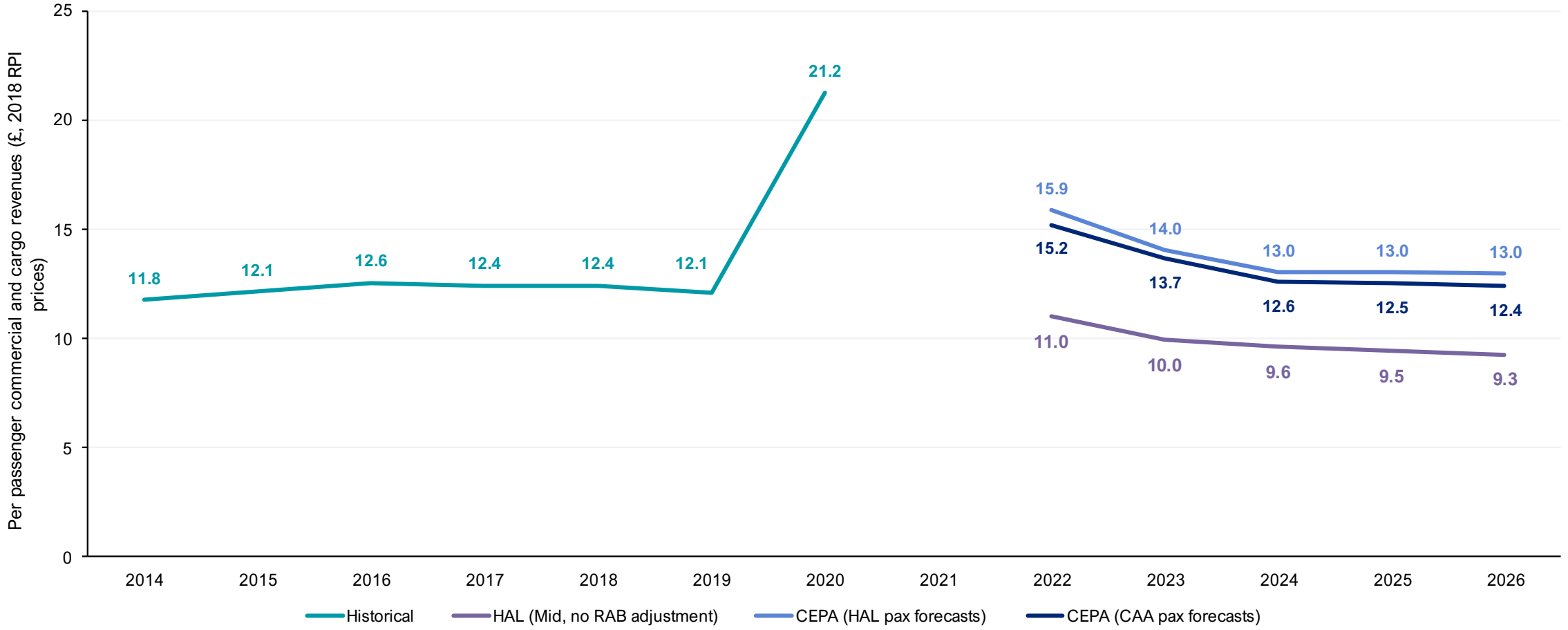


Source: CEPA analysis

Note: HAL and CEPA commercial revenue forecasts are reported on a consistent HAL Mid pax forecast scenario except for the final waterfall step which uses the CAA Mid pax forecast scenario.

Comparison of HAL and CEPA revenue forecasts

Comparison of per passenger commercial and cargo revenue forecasts



Source: CEPA analysis

Note: Both HAL and the CAA have developed High, Mid, Low pax forecasts for the H7 period. We use the Mid pax forecast for figures presented above.

Total revenues: Scenario comparison

HAL's revenue forecasts under different scenarios: *Total commercial revenues and cargo*

2018 RPI, £m	2022	2023	2024	2025	2026	H7
High, no RAB adjustment	527	628	689	720	719	**3,283**
Mid, no RAB adjustment	458	559	630	665	668	**2,981**
Low, no RAB adjustment	256	363	473	541	580	**2,212**
High, RAB adjustment	555	674	751	794	804	**3,578**
Mid, RAB adjustment	484	603	689	737	751	**3,264**
Low, RAB adjustment	261	372	487	558	599	**2,276**

Source: HAL analysis

CEPA's forecasts under different CAA passenger forecast scenarios: *Total commercial revenues and cargo*

2018 RPI, £m	2022	2023	2024	2025	2026	H7
High	774	910	979	1,052	1,072	**4,788**
Mid	694	823	908	993	1,018	**4,436**
Low	449	598	755	848	919	**3,569**

Source: CEPA analysis

Per passenger revenues: Scenario comparison

***HAL's revenue forecasts under different scenarios**: Per passenger commercial revenues and cargo*

2018 RPI, £	2022	2023	2024	2025	2026
High, no RAB adjustment	10.36	9.63	9.41	9.32	9.16
Mid, no RAB adjustment	11.02	9.95	9.60	9.45	9.27
Low, no RAB adjustment	17.58	11.62	10.08	9.79	9.52
High, RAB adjustment	10.51	9.95	9.86	9.89	9.87
Mid, RAB adjustment	11.20	10.32	10.10	10.09	10.04
Low, RAB adjustment	17.20	11.47	10.00	9.72	9.46

Source: HAL analysis

***CEPA's revenue forecasts under different CAA passenger forecast scenarios**: Per passenger commercial revenues and cargo*

2018 RPI, £	2022	2023	2024	2025	2026
High	14.29	13.13	12.22	12.20	12.14
Mid	15.21	13.68	12.61	12.51	12.42
Low	23.96	16.50	13.68	13.36	12.97

Source: CEPA analysis

UK
Queens House
55-56 Lincoln's Inn Fields
London WC2A 3LJ

T. **+44 (0)20 7269 0210**
E. info@cepa.co.uk

www.cepa.co.uk

Australia
Level 20, Tower 2 Darling Park
201 Sussex Street
Sydney NSW 2000

T. **+61 2 9006 1308**
E. info@cepa.net.au

www.cepa.net.au

cepa-ltd @cepaltd