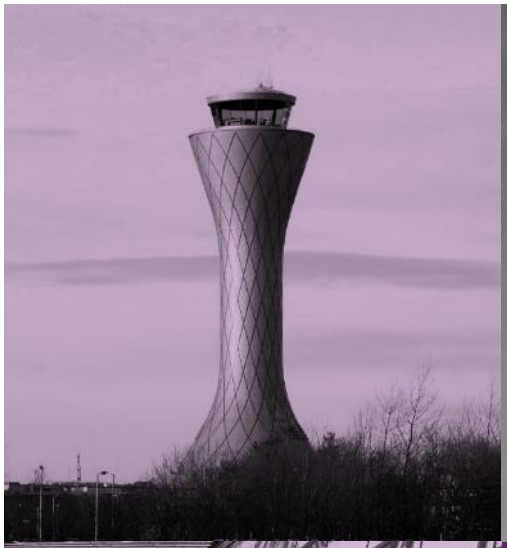
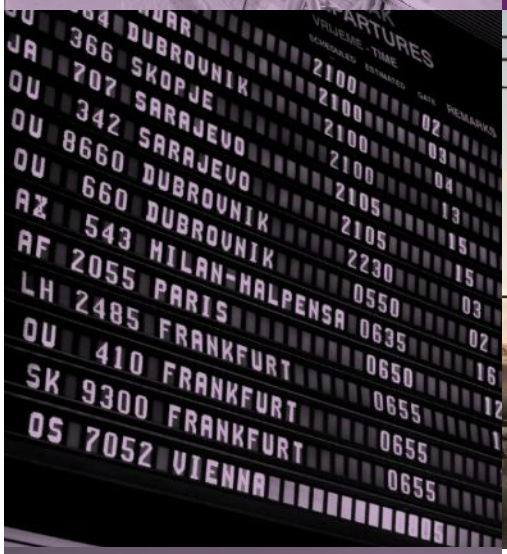


Introduction of RNP AR Procedures at London City Airport:

Stage 3 Cost Benefit Analysis



London City Airport

Final Report

February 2026

York Aviation

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Contents

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1. Introduction and Background

1.1 London City Airport (LCY) is progressing an Airspace Change Proposal (ACP-2025-003) to introduce Required Navigation Performance Authorisation Required (RNP AR) approach procedures. The proposal is being taken forward in accordance with the Civil Aviation Authority's CAP1616 Airspace Change Process.

1.2 The purpose of the airspace change is to enable the safe and efficient operation of larger, more modern and more fuel-efficient aircraft types at LCY, which are not practicable under the existing published procedures. In particular, the change facilitates the operation of aircraft such as the Airbus A320neo, allowing LCY to serve a wider range of markets while making more efficient use of its constrained runway and airspace.

1.3 This document presents a standalone cost benefit analysis (CBA) of the proposed airspace change. The CBA draws on the detailed evidence prepared for the Stage 3 Full Options Appraisal (FOA) and summarises the economic, environmental and social impacts of the with-change option relative to the without-change baseline.

1.4 The CBA has been undertaken in line with the Department for Transport's Transport Analysis Guidance (TAG). Impacts have been monetised where appropriate using TAG-compliant methodologies and values. Where monetisation is not required or would be disproportionate, impacts have been assessed qualitatively, consistent with TAG and CAP1616 guidance.

2. Demand Forecasts

2.1 The appraisal compares two scenarios over a twelve-year appraisal period from 2027 to 2038, using 2023 as the price base year:

- Without-change scenario - This represents the future operation of LCY assuming no change to the existing airspace design. Under this scenario, the airport remains constrained to currently certified aircraft types, limiting the pace of fleet transition, increasing the number of aircraft movements required to accommodate demand, and restricting the range of markets that can be served directly from LCY;
- With-change scenario - This represents the future operation of LCY assuming the introduction of RNP AR procedures. The change enables larger and more fuel-efficient aircraft to operate, allowing passenger demand to be accommodated with fewer movements and enabling LCY to serve a broader range of destinations from its existing catchment.

2.2 Passenger and air traffic movement forecasts for both scenarios have been prepared by York Aviation using a policy-compliant demand forecasting framework. The forecasts explicitly reflect changes in fleet mix, airline behaviour and market accessibility that arise as a direct consequence of the airspace change. The forecasts are set out in Annex A to the FOA.

2.3 Over the appraisal period, the with-change scenario accommodates materially more passengers than the without-change scenario while requiring significantly fewer aircraft movements to reach the airport's planning cap. These differences underpin many of the impacts assessed within the cost–benefit analysis.

3. Scope of the Cost Benefit Analysis

3.1 The scope of the CBA reflects the impacts required to be considered under CAP1616 and TAG for permanent airspace change proposals. Impacts have been assessed across the following broad categories:

- Communities (noise and air quality);
- Wider society (greenhouse gas emissions, tranquillity, biodiversity, capacity and resilience);
- Aviation users (passengers, commercial airlines and general aviation);
- Airport and air navigation service providers (ANSPs).

3.2 In line with TAG guidance, impacts have been monetised where:

- there is a clear causal relationship with the airspace change;
- robust data and accepted valuation methods exist; and
- monetisation is proportionate to the likely scale of the effect.

3.3 Where these conditions are not met, impacts have been assessed qualitatively and are considered within the overall balance of the appraisal.

4. Assessment Approach by Impact

4.1 This section sets out the approach taken to the TAG Cost Benefit Analysis.

Noise

4.2 Aircraft noise impacts have been assessed using CAP-compliant noise modelling undertaken by Bickerdike Allen Partners. The assessment compares changes in population exposure to aircraft noise between the with-change and without-change scenarios over the appraisal period.

4.3 Noise impacts have been monetised using the TAG Environmental Workbooks (December 2025). These apply standard Government values to changes in noise exposure to estimate the associated welfare effects.

4.4 The with-change option results in smaller primary noise contour areas and fewer people exposed to higher average noise levels, reflecting both fewer aircraft movements and the transition to quieter aircraft types. This results in a significant net monetised benefit. Full technical detail is provided in the Bickerdike Allen Partners noise assessment report and summarised in the FOA.

Local air quality

4.5 Local air quality impacts have been assessed by Logika (Air Quality Consultants), considering nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$).

4.6 The assessment demonstrates that pollutant concentrations remain well below relevant limit values in both scenarios, with no exceedances and only negligible differences between the with-change and without-change options.

4.7 In accordance with TAG guidance, monetisation is not required where no exceedances or material effects are identified. Local air quality impacts have therefore been assessed qualitatively. Further detail is provided in the Logika air quality report and summarised in the FOA.

Greenhouse gas emissions

4.8 Greenhouse gas (GHG) emissions have been quantified by Ecolyse based on changes in aircraft fuel burn and passenger throughput associated with the airspace change.

4.9 GHG impacts have been monetised using the TAG Environmental Workbooks (December 2025), which apply Government carbon values to changes in emissions over time.

4.10 While total emissions increase in both scenarios as passenger numbers grow, the with-change option delivers lower emissions per passenger and a reduction in cumulative emissions over the appraisal period, resulting in a net benefit to wider society. Full details are set out in the Ecolyse GHG assessment and summarised in the FOA.

Passenger surface access time savings

4.11 Passenger surface access time savings represent an additional benefit of the airspace change and reflect improved accessibility within the London airport system.

4.12 The with-change option enables LCY to serve a wider range of markets. As a result, passengers within LCY's natural catchment are able to use LCY for a greater proportion of their air travel needs, rather than travelling to alternative London system airports. This reduces surface access journey times for affected passengers.

4.13 A weighted average surface access time saving has been calculated by comparing travel times to LCY with travel times to the most popular alternative airport for passengers from each Local Authority area in London and the South East.

4.14 The analysis uses the following data sources and steps:

- Passenger origins, alternative airports and mode shares identified using the CAA Passenger Survey 2024;
- The number of LCY passengers originating from each Local Authority area used to weight the results;
- Drive times and public transport access times to each airport derived using Google Maps;
- A weighted average time saving calculated across all Local Authority areas.

4.15 This analysis indicates that a typical LCY passenger saves around 8.5 minutes in surface access time compared with travelling to the most commonly used alternative London airport.

4.16 Values of time for air passengers were taken from *Economy: Transport Economic Efficiency Impacts* (Airports Commission, July 2015), which remains the most appropriate evidence base for valuing time savings experienced by air passengers in the absence of aviation-specific values within TAG. TAG does not provide values of time for air travellers, and the Airports Commission research is therefore used to ensure consistency with established aviation appraisal practice.

4.17 The use of air passenger values of time is appropriate in this context because the beneficiary of the time saving is the air traveller, and the time saved forms part of the generalised cost of air travel associated with airport choice. Applying surface transport mode-specific values of time would not reflect the economic decision being made by passengers and would risk inconsistency with established aviation appraisal practice.

4.18 The Airports Commission research identifies distinct values of time for different air passenger segments at London City Airport, expressed in 2008 prices. The relevant values are:

- UK business passengers: £60.51 per hour
- Foreign business passengers: £66.92 per hour
- UK leisure passengers: £6.03 per hour
- Foreign leisure passengers: £6.03 per hour

4.19 These values were uplifted to the 2023 appraisal price base using the HM Treasury GDP deflator and converted to a per-minute basis by dividing by 60. In the interests of conservatism, no additional adjustment has been made for growth in real GDP per capita over time.

4.20 To reflect the composition of passengers using London City Airport, the segment-specific per-minute values of time were then weighted using the observed passenger mix derived from analysis of the CAA Passenger Survey 2024. The passenger mix applied was:

- UK business passengers: 26%

- Foreign business passengers: 15%
- UK leisure passengers: 37%
- Foreign leisure passengers: 22%

4.21 Applying these weights produces a blended average value of time of approximately £0.70 per passenger per minute.

4.22 TAG identifies a range of potential secondary impacts associated with changes in surface access demand, including vehicle operating costs, carbon emissions, accidents and indirect taxation. In this case, the behavioural change relates primarily to passengers switching between airport options rather than a conventional mode shift onto the surface transport network. The ACP does not introduce new surface access infrastructure or materially alter network capacity.

4.23 As the surface access time savings identified are positive, they are generally associated with passengers accessing an airport that is closer or more convenient for their origin. In such circumstances, it is reasonable to expect that some second-order impacts—particularly vehicle operating costs and carbon emissions—would be neutral or beneficial in many cases, although the sponsor has not relied on this assumption within the appraisal. However, these effects will vary by origin and access mode, and the sponsor has therefore not assumed universal secondary benefits. Given the scale of passenger switching implied, any such impacts are expected to be small in magnitude and unlikely to be decision-critical at a Stage 3 options appraisal.

4.24 Further detail on assumptions, analytical risks and uncertainty associated with the passenger surface access assessment is provided in Appendix A.

Fuel burn

4.25 Fuel burn impacts reflect changes in total aircraft movements and fleet efficiency arising from the airspace change.

4.26 Fuel burn has been quantified and monetised using TAG-consistent approaches, drawing on the detailed analysis undertaken by Ecolyse. The with-change option requires fewer flights to accommodate demand and enables the use of more fuel-efficient aircraft, resulting in a net fuel burn benefit.

4.27 Further detail is provided in the Ecolyse technical assessment and summarised in the FOA.

Other impacts

4.28 A range of additional impacts have been assessed qualitatively, including tranquillity, biodiversity, capacity and resilience, general aviation access, airline training and equipage costs, and airport/ANSP deployment costs.

4.29 These impacts are discussed in detail in the SOA and supporting technical reports. Overall, they are neutral or beneficial with-change. Where minor disbenefits arise (for example, airline training or implementation costs), these are limited in scale, largely transitional, and do not outweigh the overall benefits of the proposal.

Analytical Risk, Uncertainty and Proportionality

4.30 Having set out the assessment approach for each impact area, the appraisal recognises that a number of impacts assessed within this cost–benefit analysis are subject to uncertainty, specifically those related

to future airline behaviour, passenger airport choice and wider economic conditions. This is inherent in any forward-looking appraisal undertaken at an options stage under CAP1616.

4.31 In line with TAG guidance, the appraisal approach has been designed to be proportionate to both the scale of the intervention and the purpose of a Stage 3 options assessment. The proposed airspace change does not introduce new surface access infrastructure, nor does it materially alter highway or public transport network capacity. As a result, impacts are assessed using a combination of monetised and qualitative evidence, focusing on those effects that can be robustly evidenced while avoiding modelling complexity that would not be decision-critical.

4.32 Passenger surface access time savings represent a material component of the quantified appraisal and are included on the basis that they arise from a clearly defined and evidence-based behavioural mechanism—passengers switching between airport options as new services become available at London City—while being assessed in a manner proportionate to the scale and purpose of a Stage 3 options appraisal. The limitations and assumptions underpinning this assessment are described transparently in Appendix A, consistent with TAG's requirement to identify analytical risks and uncertainties where impacts are monetised.

5. Qualitative Impacts

5.1 Not all impacts identified in the assessment can be robustly quantified or monetised. In such cases, TAG allows for qualitative assessment, provided that impacts are clearly described, evidence-based and proportionate to their likely scale and significance.

5.2 The qualitative assessment draws on the detailed evidence set out in the Statement of Options Appraisal (SOA) and the relevant specialist technical reports. These impacts are considered alongside the monetised results to provide a balanced view of the overall costs and benefits of the proposed airspace change.

5.3 Table 5.1 summarises the impacts that have been assessed qualitatively, indicating both the nature of the impact and the direction of change relative to the without-change option.

Table 5.1: Summary of Qualitatively Assessed Impacts

Impact area	Assessment summary	Direction of impact
Wider society: Tranquillity	Some arrivals operate marginally lower over limited areas, but this is more than offset by fewer overall flights over the appraisal period	Net benefit
Wider society: Biodiversity	No adverse effects on European sites; reduction in flight numbers provides a small indirect benefit	Net benefit
Wider society: Capacity and resilience	Fewer flights to accommodate demand, reduced airspace and runway congestion, improved operational resilience	Net benefit
General aviation: Access	No material change anticipated; potential benefits for GA transits are hypothetical and not relied upon	Neutral
Commercial airlines: Training costs	Additional RNP AR training required but commercially recoverable and applicable beyond LCY	Minor disbenefit
Commercial airlines: Other operational costs	RNP AR equipage and approvals required but offset by wider operational utility	Neutral to minor disbenefit
Airport / ANSP: Infrastructure costs	No new airport infrastructure required	Neutral
Airport / ANSP: Operational and deployment costs	Some implementation and familiarisation costs expected but proportionate and manageable	Minor disbenefit

5.4 The qualitative assessment indicates that most non-monetised impacts are either neutral or beneficial with-change. Where disbenefits arise, these are limited in scale, largely one-off or transitional, and are considered proportionate in the context of the overall benefits delivered by the proposal.

6. Quantitative Impacts

6.1 Table 6.1 summarises the quantified and monetised impacts of the airspace change over the twelve-year appraisal period, expressed as net present values (NPV) in 2023 prices.

Table 6.1: Summary of Quantified Impacts (NPV, £m at 2023 prices)

Impact Category	Net Present Value (£m)
Level 1 Impacts	
Communities: Noise impacts	£32.2
Wider society: Greenhouse gas emissions	£3.7
General aviation / commercial airlines: Fuel burn	£2.6
Level 1 Impacts Sub-Total NPV	**£38.4**
Level 2 Impacts	
General aviation / commercial airlines: Passenger surface access time savings	£59.1
Level 2 Impacts Sub-Total NPV	**£59.1**
Total Quantified NPV (including Level 2 impacts)	**£97.4**
Total Quantified NPV (excluding Level 2 impacts)	**£38.4**

Note: The Level 1 impacts subtotal represents the monetised NPV excluding passenger surface access time savings.

6.2 Passenger surface access time savings are presented separately within the quantified appraisal as a Level 2 monetised impact, reflecting the greater uncertainty associated with future passenger airport choice and airline market development.

6.3 To provide transparency, the table therefore presents net present values both **including and excluding** passenger surface access time savings. This allows the CAA to clearly identify the contribution of this impact to the overall appraisal and to assess the robustness of the conclusions under more conservative assumptions.

6.4 The appraisal demonstrates that the proposed airspace change delivers a positive net present value on the basis of core (Level 1) monetised impacts alone, with the inclusion of passenger surface access time savings further strengthening the overall economic case.

7. Conclusions

7.1 The cost–benefit analysis demonstrates that the introduction of RNP AR procedures at London City Airport delivers a clear net benefit relative to the without-change baseline.

7.2 The proposal delivers a positive net benefit on the basis of core (Level 1) monetised impacts alone, with passenger surface access time savings presented as an additional, Level 2 benefit consistent with TAG guidance on uncertainty and proportionality.

7.3 When the qualitative assessment is also taken into account—particularly improvements in tranquillity, biodiversity outcomes, capacity and operational resilience—the overall balance of impacts is strongly in favour of the with-change option.

7.4 Where minor qualitative disbenefits are identified, these are limited in scale, largely transitional, and do not outweigh the significant and enduring benefits delivered by the proposal.

7.5 The findings of this standalone cost–benefit analysis are fully consistent with those presented in Section 4 of the Stage 3 Full Options Appraisal and reflect a proportionate application of TAG appropriate to the Stage 3 decision context.

8. Appendix A: Passenger Surface Access Time Savings

Purpose of this Appendix

8.1 This Technical Appendix provides further detail on the rationale for including passenger surface access time savings within the appraisal, and the method used to quantify and monetise these benefits. It supports the summary description provided in the main body of this report (paragraphs 4.11 to 4.24) and provides transparency on the data sources, key assumptions and calculation steps applied.

8.2 The surface access time savings form part of the Transport Economic Efficiency (TEE) impacts of the proposal. They arise because the airspace change enables LCY to support additional operators and a broader range of destinations, allowing the airport to re-capture ("claw back") passengers within its natural catchment who, in the without-change scenario, would travel to alternative London system airports to meet their travel needs.

TAG Basis for Inclusion of Passenger Time Savings

8.3 The Department for Transport's Transport Analysis Guidance (TAG) recognises that aviation interventions can generate travel time benefits and that, where practical and proportionate, these should be assessed and valued. TAG Unit A5.2 (Aviation Appraisal) notes that many aviation interventions may generate time savings to passengers and that, where possible, these should be appraised using changes in time components and associated values of time, while ensuring that impacts are not double counted. In particular, TAG explains that where Generalised Journey Time (GJT) components are not fully observable, analysis should include those components for which robust evidence is available, adopting a proportionate approach.

8.4 In the context of this proposal, the principal time-related impact that can be robustly evidenced is surface access journey time. This is distinct from in-terminal processing time, in-flight time, delay and frequency/waiting time components that may also be relevant in other aviation appraisals. The passenger time savings in this appraisal therefore relate specifically to a change in surface access time to the departure airport, rather than changes in in-air or within-airport journey time components.

8.5 The approach adopted is consistent with TAG's overarching principle that appraisal should quantify and monetise welfare impacts where possible, and adopt qualitative assessment where not. It also reflects TAG's guidance that appraisal effort should be proportionate to the scale of impact and to the availability of evidence.

Rationale for Surface Access Time Savings in this Appraisal

8.6 LCY operates within a highly competitive multi-airport system. In the without-change scenario, the airport remains constrained to currently certified aircraft types and operating characteristics, which limits the range of markets that can be served efficiently and/or profitably. As a consequence, a proportion of passengers who reside within LCY's natural catchment must travel to other London system airports (for example, Heathrow, Gatwick, Stansted or Luton) in order to access suitable services (in terms of destination, frequency and/or fare).

8.7 The with-change scenario enables operation by larger, modern, fuel-efficient aircraft and supports market entry and expansion by additional operators. This increases the breadth of markets that can be served from LCY and improves the likelihood that passengers within LCY's catchment can meet their travel needs from LCY rather than travelling to another airport.

8.8 The benefit mechanism is therefore:

- Supply-side change enabled by the ACP →
- Greater route/market coverage and/or competitive offerings at LCY →
- Passengers in LCY catchment switch departure airport from an alternative London system airport to LCY →
- Reduction in surface access travel time (and associated welfare benefit when valued using appropriate values of time).

8.9 These benefits represent real resource/time savings to passengers, not simply a redistribution of demand between airports. While the wider system effects include changes in airport market shares, the welfare benefit from reduced surface access time accrues to passengers and is appropriately captured within the TEE element of the CBA.

Overview of the Calculation Approach

8.10 The methodology comprises two linked components:

- Estimation of an average surface access time saving per passenger (minutes per passenger) when using LCY instead of the most common alternative London system airport for passengers originating in each Local Authority area; and
- Application of that average time saving to the relevant volume of passengers in the appraisal (those expected to be "clawed back" to LCY under the with-change scenario compared with the without-change baseline), with monetisation using appropriate values of time and discounting over the appraisal period.

8.11 The calculation is implemented through:

- A supporting spreadsheet calculating the weighted average surface access time saving, based on passenger origins and revealed airport choice patterns (CAA Passenger Survey 2024) and observed surface travel times (Google Maps).
- The TAG Assessment Model, which applies the average time saving and values of time to the relevant passenger volumes over the appraisal period to produce the monetised NPV reported in the Appraisal Summary Table.

Data Sources

8.12 The following data sources have been used.

Passenger origins, airport choice and mode shares

8.13 CAA Passenger Survey 2024 was used to identify:

- the distribution of LCY passengers by Local Authority area (London and South East),
- the most popular alternative airport used by passengers from each area (where LCY is not used), and

- mode shares (car/drive vs public transport) relevant to airport access patterns.

Surface access travel times

8.14 Google Maps was used to identify:

- indicative drive times from each Local Authority area to each airport considered, and
- indicative public transport travel times from each Local Authority area to each airport considered.

8.15 The approach used consistent settings across locations to provide a comparable basis for relative journey time differences.

Values of time

8.16 Values of time for air passengers were taken from *Economy: Transport Economic Efficiency Impacts* (Airports Commission, July 2015), which remains the most appropriate evidence base for valuing time savings experienced by air passengers in the absence of aviation-specific values within TAG. TAG does not provide values of time for air travellers, and the Airports Commission research is therefore used to ensure consistency with established aviation appraisal practice.

8.17 The use of air passenger values of time is appropriate in this context because the beneficiary of the time saving is the air traveller, and the time saved forms part of the generalised cost of air travel associated with airport choice. Applying surface transport mode-specific values of time would not reflect the economic decision being made by passengers and would risk inconsistency with established aviation appraisal practice.

8.18 The Airports Commission research identifies distinct values of time for different air passenger segments at London City Airport, expressed in 2008 prices. The relevant values are:

- UK business passengers: £60.51 per hour
- Foreign business passengers: £66.92 per hour
- UK leisure passengers: £6.03 per hour
- Foreign leisure passengers: £6.03 per hour

8.19 These values were uplifted to the 2023 appraisal price base using the HM Treasury GDP deflator and converted to a per-minute basis by dividing by 60. In the interests of conservatism, no additional adjustment has been made for growth in real GDP per capita over time.

8.20 To reflect the composition of passengers using London City Airport, the segment-specific per-minute values of time were then weighted using the observed passenger mix derived from analysis of the CAA Passenger Survey 2024. The passenger mix applied was:

- UK business passengers: 26%
- Foreign business passengers: 15%
- UK leisure passengers: 37%
- Foreign leisure passengers: 22%

8.21 Applying these weights produces a blended average value of time of approximately £0.70 per passenger per minute.

8.22 The £0.70 per passenger per minute value is not a new or assumed value of time, but a weighted average derived directly from segment-specific evidence. It has been adopted as a practical and transparent conversion factor to monetise minute-level surface access time savings within the spreadsheet-based appraisal. The approach ensures consistency with the appraisal price base and avoids the need to apply multiple segment-specific values within the calculation, while remaining fully grounded in established air passenger values of time.

Appraisal parameters

8.23 Appraisal period, price base and discounting assumptions are as defined in the main report and implemented in the TAG Assessment Model.

Step-by-Step Method

Step 1: Define geographic zones for analysis

8.24 The analysis was undertaken at Local Authority level across London and the South East. This spatial resolution provides a robust balance between:

- reflecting meaningful differences in surface access times across the region; and
- maintaining sufficient passenger sample sizes in the CAA Passenger Survey for stable estimates of airport usage patterns.

Step 2: Identify the "most popular alternative airport" for each Local Authority

8.25 For each Local Authority, the analysis identified the most popular alternative London system airport used by passengers, based on CAA Passenger Survey 2024 revealed behaviour. This establishes a realistic comparator airport for "where passengers would otherwise go" in the absence of the improved market offering at LCY.

8.26 This approach is deliberately conservative and pragmatic: it avoids selecting an alternative airport based on hypothetical minimum-time routing and instead reflects the dominant revealed preference for that Local Authority.

Step 3: Establish mode shares for airport access

8.27 Using the CAA Passenger Survey 2024, mode share splits (drive vs public transport) were identified for travel to each airport. This is important because the relative time advantage of LCY versus other airports differs materially between modes.

8.28 Mode shares were then used as weights when combining drive and public transport times into a single "expected access time" to each airport for passengers originating in each Local Authority.

Step 4: Derive surface access times to LCY and to the alternative airport

8.29 For each Local Authority:

- Drive time to LCY and to the alternative airport was obtained from Google Maps; and
- Public transport time to LCY and to the alternative airport was obtained from Google Maps.

8.30 The analysis used a consistent basis (same tool, consistent approach to queries) to ensure that the resulting time differences are comparable across areas and airports.

Step 5: Calculate time saving by Local Authority

8.31 For each Local Authority, an expected (mode-weighted) time saving was calculated as:

$$\Delta T_{LA} = T_{Alt,LA} - T_{LCY,LA}$$

8.32 Where:

- $T_{Alt,LA}$ is the mode-weighted surface access time to the most popular alternative airport; and
- $T_{LCY,LA}$ is the mode-weighted surface access time to LCY.

8.33 A positive value indicates that LCY offers a time saving relative to the alternative airport.

Step 6: Weight time savings by passenger volumes to derive an average saving

8.34 Local Authority time savings were weighted by the number of LCY passengers originating in each Local Authority (from CAA Passenger Survey 2024) to calculate a passenger-weighted average saving:

$$\Delta T_{avg} = \frac{\sum_{LA}(\Delta T_{LA} \times Pax_{LA})}{\sum_{LA} Pa\, x_{LA}}$$

8.35 This approach ensures that the final average is representative of the passenger population affected, rather than a simple unweighted geographic average.

8.36 The weighted average saving is approximately 8.5 minutes per passenger.

Step 7: Apply average time saving to the relevant passenger volume in appraisal

8.37 The monetised benefit depends on the number of passengers assumed to experience this time saving. In this appraisal, the relevant passenger volume is those passengers who, under the with-change scenario, are expected to use LCY rather than another London system airport due to the enhanced market offering enabled by the airspace change (i.e. “claw back” demand).

8.38 The relevant annual volumes are taken from the demand forecasts and are applied within the TAG Assessment Model. The model calculates annual benefits as:

$$Benefit_y = \Delta T_{avg} \times PaxShift_y \times VoT$$

8.39 Where:

- ΔT_{avg} is the weighted average time saving (hours),
- $PaxShift_y$ is the annual passenger volume shifting to LCY in year y, and
- VoT is the value of time per passenger (uprated to 2023 prices).

8.40 Benefits are then discounted over the appraisal period and expressed as a net present value (NPV), consistent with the approach used for other monetised impacts within the CBA. Discounting has been applied using the standard Social Time Preference Rate set out in TAG. Discount factors have been

applied explicitly on a year-by-year basis to ensure transparency and facilitate verification, consistent with TAG workbook calculation steps.

Step 8: Values of time and price base

8.41 Values of time are drawn from the Airports Commission research report ("Economy: Transport Economic Efficiency Impacts", July 2015) and uprated to the 2023 price base used in this appraisal. This ensures internal consistency with the appraisal's price base and the presentation of other monetised impacts.

8.42 The approach adopted follows the principle set out in TAG that, where evidence is robust for specific time components, these can be monetised using appropriate values of time, adopting a proportionate approach.

Key Assumptions and Limitations

8.43 The calculation relies on the following key assumptions:

- Alternative airport selection: The most popular alternative airport by Local Authority, derived from CAA Passenger Survey 2024, is an appropriate proxy for where passengers would otherwise travel.
- Mode shares: Mode shares observed in the CAA Passenger Survey 2024 are assumed to be representative of affected passengers and stable for the purposes of the weighted time calculation.
- Journey times: Google Maps journey times are treated as representative "typical" travel times. As with any such approach, times may vary by time of day and day of week; however, the analysis is focused on *relative* differences between airports, and uses a consistent methodology across areas.
- Average time saving stability: The average time saving (just over 8 minutes) is applied as a representative saving across the appraisal period.
- Passenger volumes affected: The TAG Assessment Model applies the time saving to the passenger volumes expected to "claw back" to LCY, rather than to the entire LCY passenger base, ensuring the benefit reflects the marginal impact of the ACP rather than overstating benefits.
- Trip redistribution and reassignment: The appraisal does not include detailed highway or public transport network assignment. Passenger redistribution is captured at a strategic level through the demand and airport allocation analysis, which reflects switching between airport options rather than changes in underlying surface travel demand. Given the scale of passenger switching relative to total surface transport demand in London, material network-wide reassignment effects are not expected, and TAG does not require these to be modelled explicitly at an options appraisal stage.

8.44 The analysis is intended to be proportionate and transparent. It focuses on the principal surface access time effect that can be evidenced robustly, and does not attempt to quantify other potential time-related effects (for example, changes in flight frequency or waiting time) for which evidence is less certain or could risk double counting with other components of aviation generalised cost.

Analytical Risks, Uncertainty and Proportionality

8.45 The sponsor recognises that the estimation of passenger surface access time savings is subject to a number of sources of uncertainty and analytical limitation. These uncertainties are inherent to forecasting passenger behaviour and airport choice over a long-term appraisal period and are not unique to this proposal.

8.46 The primary source of uncertainty relates to the extent and timing of passenger switching between London system airports in response to the enhanced market offering at London City Airport enabled by the airspace change. This, in turn, depends on future airline decisions, competitive responses from other airports, and wider macro-economic conditions. While the demand forecasts underpinning the appraisal reflect a policy-compliant assessment of these effects, actual outcomes may differ from forecast.

8.47 There is also uncertainty associated with the estimation of surface access journey times. The analysis relies on indicative travel times derived from Google Maps and applies observed mode shares from the CAA Passenger Survey as representative of passenger behaviour. Actual journey times experienced by individual passengers will vary by time of day, day of week and prevailing network conditions. However, the methodology is focused on relative differences in access time between airports, and applies a consistent approach across all locations, which mitigates the risk of systematic bias.

8.48 The appraisal does not include detailed highway or public transport network assignment or modelling of second-order network effects such as congestion or crowding. Given the scale of passenger switching implied relative to total surface transport demand in London, the sponsor does not consider such effects likely to be material or decision-critical at a Stage 3 options appraisal. TAG guidance allows such impacts to be treated proportionately where they are unlikely to affect the overall appraisal conclusions.

8.49 Despite these uncertainties, the sponsor considers that inclusion of passenger surface access time savings within the cost–benefit analysis is justified. The benefit mechanism is clearly defined, the direction of impact is unambiguous, and the magnitude of passenger switching required to generate the reported benefits is modest relative to the size of the addressable market within London City Airport's catchment. The approach adopted is transparent, evidence-based and proportionate, and focuses on the principal surface access time component for which robust data are available.

8.50 Consistent with this uncertainty, the passenger surface access time savings are presented as a Level 2 monetised impact within the main appraisal, reflecting their plausible but uncertain nature while maintaining transparency on their potential scale.

8.51 To further illustrate robustness, a sensitivity test has been undertaken which applies a substantially more conservative assumption regarding realised surface access time savings, while holding underlying passenger demand unchanged. This sensitivity is presented separately and demonstrates that the surface access benefit remains positive even under materially reduced assumptions.

Results

8.52 The supporting calculation indicates that the typical LCY passenger saves around 8.5 minutes in surface access time relative to travelling to the most commonly used alternative London system airport, when assessed on a passenger-weighted basis across Local Authorities in London and the South East.

8.53 Applying this average saving to the passenger volumes shifting to LCY under the with-change scenario, and valuing time savings using the Airports Commission values of time (uprated to 2023 prices), the TAG Assessment Model produces a monetised passenger surface access time saving benefit reported in the

main appraisal. The TAG Assessment Model indicates an NPV for this impact of approximately £59.1m (2023 prices) over the appraisal period. The results are set out in Table A.1.

Table A.1: Passenger Surface Access time Savings at 2023 Prices

Year	Without change Passengers (m)	With change Passengers (m)	Difference Passengers (m)	Time saved: (Days, based on 8.5 min/pax)	Undiscounted Benefit (£, based on 70p/min/pax)	Discount Factor at 3.5%	Present Value (£, based on 70p/min/pax)
2023	3.4	3.4	0	0	£0	1.000	£0
2024	3.6	3.6	0	0	£0	1.035	£0
2025	3.8	3.8	0	0	£0	1.071	£0
2026	3.8	3.8	0	0	£0	1.109	£0
2027	4.1	4.1	0	0	£0	1.148	£0
2028	4.2	4.4	0.2	1,236	£1,251,361	1.188	£1,053,612
2029	4.4	5.1	0.7	3,911	£3,959,627	1.229	£3,221,159
2030	4.6	5.6	1.0	6,014	£6,087,816	1.272	£4,784,968
2031	4.8	6.2	1.4	7,969	£8,067,127	1.317	£6,126,270
2032	5.1	6.6	1.5	8,917	£9,027,311	1.363	£6,623,618
2033	5.4	7.1	1.8	10,563	£10,692,928	1.411	£7,580,418
2034	5.7	7.7	2.0	12,062	£12,211,310	1.460	£8,364,084
2035	6.0	8.4	2.5	14,496	£14,674,547	1.511	£9,711,370
2036	6.9	**9.0**	2.1	12,326	£12,477,948	1.564	£7,978,452
2037	8.0	**9.0**	1.0	5,785	£5,856,361	1.619	£3,617,953
2038	**9.0**	**9.0**	0	0	£0	1.675	£0
Total	**c.68m**	**c.82m**	**c.14m**	**c.83,279 days**	**£84,306,337**		**£59,061,905**

(12-year NPV when discounted at standard Social Time Preference Rate of 3.5%)

8.54 This benefit is reported within the Appraisal Summary Table and forms the largest single component of the quantified benefits within the overall CBA.

Sensitivity Test

8.55 Passenger surface access time savings represent the largest single component of the quantified NPV. The sponsor recognises that this impact is subject to greater uncertainty than other monetised effects, as it depends on future passenger airport choice and airline market development. In line with TAG guidance, a sensitivity test has therefore been undertaken to illustrate the robustness of the surface access benefit to more conservative assumptions.

8.56 The sensitivity presented in Table A.2 tests the surface access time saving calculation itself, while holding the underlying passenger demand forecasts unchanged. Specifically, it assumes that passengers realise only 50% of the average surface access time saving assumed in the central case. This represents a deliberately conservative assumption and could reflect a range of outcomes, including variation in airport switching patterns, different realised access routes or modes, or higher levels of congestion affecting access to London City Airport relative to the central estimate.

Table A.2: Passenger Surface Access time Savings Sensitivity Test at 2023 Prices

Year	Without change Passengers (m)	With change Passengers (m)	Difference Passengers (m)	Time saved: (Days, based on 8.5 min/pax)	Undiscounted Benefit (£, based on 70p/min/pax)	Discount Factor at 3.5%	Present Value (£, based on 70p/min/pax)
2023			0	0	£0	1.000	£0
2024			0	0	£0	1.035	£0
2025	3.8	3.8	0	0	£0	1.071	£0
2026	3.8	3.8	0	0	£0	1.109	£0
2027	4.1	4.1	0	0	£0	1.148	£0
2028	4.2	4.4	0.2	618	£625,680	1.188	£526,806
2029	4.4	5.1	0.7	1,956	£1,979,814	1.229	£1,610,580
2030	4.6	5.6	1.0	3,007	£3,043,908	1.272	£2,392,484
2031	4.8	6.2	1.4	3,985	£4,033,564	1.317	£3,063,135
2032	5.1	6.6	1.5	4,459	£4,513,656	1.363	£3,311,809
2033	5.4	7.1	1.8	5,282	£5,346,464	1.411	£3,790,209
2034	5.7	7.7	2.0	6,031	£6,105,655	1.460	£4,182,042
2035	6.0	8.4	2.5	7,248	£7,337,273	1.511	£4,855,685
2036	6.9	**9.0**	2.1	6,163	£6,238,974	1.564	£3,989,226
2037	8.0	**9.0**	1.0	2,893	£2,928,181	1.619	£1,808,977
2038	**9.0**	**9.0**	0	0	£0	1.675	£0
Total	**c.68m**	**c.82m**	**c.14m**	**c. 41,640**	**£42,153,168**		**£29,530,952**

(12-year NPV when discounted at standard Social Time Preference Rate of 3.5%)

8.57 Under this substantially more conservative assumption, the net present value of passenger surface access time savings is reduced to approximately £29.5 million over the 12-year appraisal period (discounted at the standard Social Time Preference Rate of 3.5%). This demonstrates that, even when assuming materially lower realised time savings per passenger, the surface access benefit remains positive and continues to make a meaningful contribution to the overall appraisal.

Summary

8.58 The passenger surface access time savings included in this appraisal are consistent with TAG guidance on the inclusion of time-related impacts for aviation interventions, adopting a proportionate approach focused on the component for which robust evidence is available.

8.59 The airspace change is expected to enable additional operators and a broader market offering at LCY, allowing the airport to claw back passengers from within its catchment who would otherwise travel to other London system airports. The resulting reduction in surface access journey time delivers a welfare benefit that has been quantified using passenger survey evidence and observed travel times, and monetised using established air passenger values of time uprated to the appraisal price base.

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