EARLY GROWTH
INCREASING FLIGHTS ON OUR EXISTING RUNWAYS

JUNE 2019
Heathrow is consulting on proposals for an expanded airport.

The Airport Expansion Consultation is our statutory consultation and we will be seeking your view on four key areas:

- Heathrow’s preferred masterplan for expansion: our proposals for the future layout of the airport including the runway and other airport infrastructure such as terminals and road access. The masterplan will also reveal the airport’s growth in phases – from runway opening in around 2026, to the end masterplan in approximately 2050;

- Plans to operate the future airport: how the future three runway airport will be operated, including important elements such as night flights, as well as how potential additional flights before the new runway opens could be operated on our existing two runways;

- Assessment of impacts of the airport’s growth: our preliminary assessment of the likely impacts of expansion on the environment and local communities;

- Plans to manage the impacts of expansion: we will set out the airport’s plans for mitigating the effects of expansion, including property compensation, our Noise Insulation Policy, a Community Fund, and measures to mitigate against air pollution, carbon, and other environmental effects.

We are grateful for feedback provided at previous consultations, and have considered these responses in developing our proposals. We now ask for your views on our preferred proposals, so that we can further improve our project before we apply for development consent next year. You can provide feedback:

- online using the feedback form on our website aec.heathrowconsultation.com
- complete a feedback form, available at events or on request calling 0800 307 7996
- email us at feedback@heathrowconsultation.com
- write to us at Freepost LHR AIRPORT EXPANSION CONSULTATION

We have set out our proposals in a number of documents covering different topics and different levels of detail. All of these are available on our website, at Document Inspection Locations and at consultation events.
# Airport Expansion Consultation Document

**Overview and Summary of the Below Documents**

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**Feedback Form**

Have your say on the consultation by using the Airport Expansion Consultation Feedback Form or on our website aer.heathrowconsultation.com.
EXECUTIVE SUMMARY

This report has been produced to explain Heathrow’s proposals for early air traffic movements (ATM) growth by the increased use of the two existing runways prior to the opening of the new third runway.

In 2016 we announced our intention to bring forward proposals for the introduction of up to 25,000 additional ATMs a year to respond to the urgent need for additional airport capacity. Early ATM growth forms part of the first phase of our expansion proposals, which would take effect soon after the grant of consent for our Development Consent Order (DCO) application.

Heathrow’s operations are currently capped at 480,000 annual ATMs by a condition imposed on the grant of planning permission for Terminal 5 in 2001. Heathrow has been operating at around 98% of that approved capacity since 2005 and there is substantial pent up demand. With the grant of our DCO application, that restriction would be lifted and more flights would be permitted.

Early ATM growth will bring substantial economic and consumer benefits in the national and local interest as well as enhanced connectivity for Heathrow and the UK. The Airports National Policy Statement (Airports NPS) confirms that:

“*The needs case has shown the importance of developing capacity more quickly.*”

We have been testing how more flights could be introduced without unacceptable effects on the environment and communities and without undermining the efficiency and resilience of the airport and airline operations.

In this document we outline our work to date and our emerging thinking; namely that early ATM growth of up to 25,000 ATMs can be introduced consistently with the policies of the Airports NPS and Heathrow’s parameters for quality service and resilience. Our latest analysis indicates that it will be beneficial to implement early ATM growth in phases, with the first stage commencing around 12 months after the grant of our DCO consent and with different levels of growth during peak and off-peak times of days, months and seasons.

In recent years, new technology has allowed us to deliver and plan improvements to the efficient use of our runways, such as Independent Parallel Approaches (IPA), and enhanced Time Based Separation (eTBS). Further enhancements involve changes to physical airfield facilities such as stands, hold and terminal areas which increase Heathrow’s capacity and give us confidence that early ATM growth can be achieved whilst maintaining airport efficiency for our airlines and passengers.

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1 Airports NPS paragraph 3.74
Assessment also shows that early ATM growth can be introduced whilst complying with the environmental policy requirements set out in the Airports NPS. Accordingly, we intend to include proposals for early ATM growth in our DCO application, so that we can realise some of the benefits of expansion before the third runway opens.

We have carefully developed and assessed a suite of measures that we propose to introduce with the development of a three runway airport to manage effects on the environment, on our communities and on the efficiency of the operation of the airport. These include our preferred proposal for a ban on scheduled flights from 23:00 to 05:30.

As part of our work on early ATM growth we have examined which of those measures might be brought forward earlier. Our emerging thinking in this context is:

1. that our preferred proposal is to bring forward a ban on early morning arrivals being scheduled to arrive before 05:30 (which means no scheduled arrivals on the runway before 05:15) (this would replace the current voluntary ban of scheduled arrivals before 04:30 on the runway); ²
2. that our enhanced Noise Insulation Scheme, which has been announced as part of our expansion proposals will be in place before early ATM growth is implemented; and
3. similarly, that we will bring forward our commitment to a framework of Environmentally Managed Growth, which will be independently scrutinised to ensure that the expansion of Heathrow is always monitored and controlled so that its effects fall inside the levels of acceptability identified in the Airports NPS.

In addition, we would continue to comply with current defined criteria in relation to airport operational resilience and service quality to ensure that early ATM growth is achieved without undermining the effective operation of the airport for our airlines, passengers and communities.

We propose that our DCO consent would be granted subject to these environmental and operational parameters so that airlines could open new routes or increase the frequency of services to existing destinations, so long as the parameters are observed.

Early ATM growth will also provide passenger and consumer benefits by helping us with our challenge to keep aeronautical charges close to current levels throughout the expansion of the airport.

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² We are examining how best we achieve the transition between this measure and the full range of measures for the six and a half hour ban on scheduled flights, which would be introduced with the opening of the third runway.
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1. **INTRODUCTION**

1.1.1 The purpose of this document is to explain Heathrow’s proposals to make increased use of the existing runways before the opening of the third runway – in other words, to bring forward the benefits of a growth in air traffic movement (ATMs) capacity at Heathrow.

1.1.2 In September 2016, we announced our intention to bring forward proposals to increase the use of our existing runways by an additional 25,000 ATMs. This growth is part of a package which we called “Brexit boost”; a proposal to respond to the urgent need for additional airport capacity from the grant of DCO consent, four years before the opening of the new runway. We explained that early ATM growth would bring forward the benefits of expansion but also bring forward the necessary mitigation; including the proposed introduction of a later start for scheduled early morning flights as well as our expansion proposals for noise insulation.

1.1.3 Our intention to promote early ATM growth was explained in our January 2018 public consultation and again in January 2019 within our Airspace and Future Operations Consultation documents. We did not consult on specific proposals in either consultation because proposals for early ATM growth depend in part on other operational and airspace issues which were the subject of the January 2019 consultation. With the feedback from the Airspace and Future Operations Consultation we can now present our emerging proposals for early ATM growth and seek your views before we finalise our approach for the DCO application.

1.1.4 Heathrow’s operations are currently capped at 480,000 annual ATMs per year by a condition imposed on the grant of planning permission for Terminal 5 in 2001. Heathrow has been operating at around 98% of that approved capacity since 2005 to the detriment of consumer and economic interests. We are seeking to lift this restriction so that we can make better use of our existing runways prior to the opening of the new third runway.

1.1.5 Additional use of the runways is being sought on the basis that infrastructure and operational improvements will enable us to grow without unacceptable impacts to our communities, the environment and our current and future airlines and passengers.

1.1.6 In this document we explain the work underway to define the proposals for early ATM growth that we intend to include in our DCO application.

1.1.7 The remainder of this document is structured as follows:

Chapter 2: The need for early growth
Chapter 3: Current operations and capacity
Chapter 4: Testing capacity improvements
Chapter 5: Our emerging proposals and mitigation.
2. THE NEED FOR EARLY ATM GROWTH

2.1.1 The need for increased airport capacity is established in the Airports National Policy Statement (Airports NPS).

2.1.2 The Airports NPS identifies the critical contribution of aviation to the UK economy; in 2014 the UK aviation sector generated around £20 billion of economic output and directly employed around 230,000 workers, supporting many more jobs indirectly. However, the work of the Airports Commission also highlighted that there were severe constraints on the UK’s existing airport capacity and that those constraints are generating a series of adverse effects as well as limiting the UK’s potential for growth. The Airports NPS identifies that these constraints are restricting our ability to travel conveniently, preventing competition between airlines and causing increased fares at the same time as reducing domestic connectivity and eroding the UK’s hub status. In all these respects, the national interest is not being served and the public interest is suffering. As a consequence, the Airports NPS recognises:

“The UK’s hub status is already being challenged by restricted connectivity. Hub airports at Paris, Frankfurt and Amsterdam have spare capacity and are able to attract new flights to growth markets in China and South America. These competitors have benefitted from the capacity constraints at Heathrow Airport and have seen faster growth over the past few years.”

2.1.3 This analysis is consistent with that reached by the Airports Commission, who advised that, whilst Heathrow has a strong position amongst European hubs on routes to North America and other established aviation markets, it has not been able to build on this and establish a similar position of strength in routes to emerging economies. The Commission also identified that the number of domestic routes to Heathrow airport is declining, restricting access from other UK regions to Heathrow’s network of international services.

2.1.4 The Airports NPS is clear that the consequences of not increasing airport capacity in the south-east would be detrimental to the UK economy and to the UK’s hub status. International connectivity would be restricted, fares are likely to rise further, whilst the lack of available slots makes it more difficult for new airlines to enter the market. Without expansion, capacity constraints would impose increasing costs on the rest of the economy over time, lowering economic output.

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3 Airports NPS paragraph 2.5
4 Airports Commission Interim Report executive summary paragraph 23
by making aviation more expensive and less convenient to use, with knock on effects in lost trade, tourism and foreign direct investment. 5.

2.1.5 It was against this background that the Government endorsed the need for a third runway. However, the proposed new runway will not be open until c.2026, 11 years after the Airports Commission’s final report. Accordingly, the Airports Commission recommended that, before new capacity becomes operational, better use should be made of existing airport infrastructure at other airports, particularly through enhancing the capacity of existing runways through increased efficiency in the use of airspace for landings and departures. 6

2.1.6 We explored this opportunity at Heathrow to test the feasibility of increasing capacity without undermining the efficient operation of the airport. In September 2016 we announced proposals to include increased use of the two existing runways as part of our DCO application and we revealed that there were 30 airlines waiting to start new routes at Heathrow or increase flights to long-haul destinations.

2.1.7 In principle, the Airports NPS is clear that “the needs case has shown the importance of developing capacity more quickly”. 7

2.2 **Economic Benefits**

2.2.1 Estimates can be made of the economic benefits of early ATM growth by extrapolating from the Government’s own forecasts of economic benefits for expansion as a whole. The value of the direct benefits arising from an additional 25,000 movements is estimated at an additional £0.6 billion per annum. In addition, indirect benefits would be achieved from the enhanced connectivity, foreign direct investment and the tourism that additional movements would generate. Based on Government estimates, we have calculated a further annual benefit of £0.9 billion.

2.2.2 Other important benefits that would be brought forward include:

- by 2025 it is expected that early ATM growth would result in between 7,100 and 12,000 additional jobs, of which approximately 5,200 would be directly employed at the airport; 8
- enhanced connectivity for passengers, freight operators and for the UK;

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5 Airports NPS paragraphs 2.14-2.16
6 Airports Commission interim report executive summary paragraph 36
7 Airports NPS paragraph 3.74
8 Preliminary Environmental Information Report (PEIR) Chapter 18, Table 18.45
improved competition, greater consumer choice, more routes, greater connectivity and lower fares for passengers; and

direct business benefits in bringing forward early ATM growth during the period before the runway opens.

In particular, the period from the grant of DCO in 2021 through to the opening of the runway in c.2026 involves the heaviest capital investment in expansion with no incremental air traffic movements above the current 480,000, unless early ATM growth can commence in 2022 to help mitigate the associated increase in the aeronautical charge. In the absence of early ATM growth, consumers would be likely to bear the cost of higher aeronautical charges passed on by airlines. Conversely, the phased implementation of early ATM growth from 2022 would generate additional passengers, and this benefit would translate directly into helping to deliver Heathrow’s challenge to deliver expansion at close to current charges. Early ATM growth is an important component in delivering our obligation to ensure that expansion is cost efficient and sustainable, minimising costs to airlines, passengers and freight owners.  

2.2.4 Early ATM growth would be the first phase of Heathrow’s expansion programme, which will only take place if it meets the environmental policy requirements set out in the Airports NPS. As paragraph 4.13 of the Airports NPS explains:

“The effects of any changes in operations, including the number of air traffic movements during the construction and operational phases must be properly assessed and appropriate mitigation secured for any significant effects.”

2.2.5 In order to understand the potential environmental effects of early ATM growth and how these might be mitigated, as well as to understand the operational impacts of the phased introduction of additional air traffic movements at the airport, a number of scenarios have been developed and evaluated – these are explained in Chapter 4.

2.2.6 Chapter 3 explains the nature of the existing airport operation and the way in which capacity for additional movements can be achieved through airspace and other operational efficiencies.

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9 As required by paragraph 4.39 of the Airports NPS.
3. AIRPORT OPERATIONS AND CAPACITY

3.1.1 We have published a document as part of this consultation entitled Future Runway Operations, which provides a more comprehensive explanation of Heathrow’s current operational practices and the way in which those might change for a three runway operation following the grant of our DCO application. Accordingly, only a brief introductory summary of current airport operations is set out below. For more information please see the Future Runway Operations document.

3.1.2 Heathrow is the UK’s only hub airport. Hub airports combine direct passengers, transfer passengers and freight to enable long-haul aircraft to fly to destinations all over the world that cannot be served by “point to point” airports, which rely on local demand alone. Today Heathrow serves over 200 destinations in more than 80 countries.

3.1.3 Heathrow is the busiest airport in the UK with approximately 650 arrivals and 650 departures every day. In 2018 the airport handled approximately 80 million passengers and, in the year starting 1 April 2018, 476,000 ATMs.

3.1.4 Heathrow Airport is currently limited to no more than 480,000 ATMs per year as a condition of the 2001 Terminal 5 planning permission. Heathrow has effectively been operating at 98% of its permitted runway throughput since 2005. Efficiency improvements have enabled us to operate the airport increasingly close to this permitted maximum number of flights and Heathrow expects to reach the cap this year, i.e. operating 480,000 air traffic movements. However, the cap is a major constraint on Heathrow’s operation and on the wider economic benefits that Heathrow can provide, as well as constraining consumer choice.

3.1.5 The airport operates 24 hours a day, although there are restrictions on night time (23:00 to 07:00) operations which limit the type of aircraft that can operate at night across the summer and winter seasons. There is a more restrictive period (23:30 to 06:00) known as the Night Quota period, limited by the Department for Transport’s seasonal Night Quota limit.10 In addition, Heathrow operates a voluntary arrangement in which it does not schedule flights between 23:05 and 04:45. In consequence, aircraft that are scheduled to arrive from 04:45 are not allowed to land before 04:30. There are no restrictions on the number of aircraft

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10 Night Quota is a combination of both the Movement Limit (maximum permitted number of night movements in a season) and Noise Quota (maximum permitted sum of Quota Count of all night movements in a season) where Quota Count is the QC points assigned to an individual night movement.
permitted to operate between 23:00 and 23:30 or between 06:00 and 07:00, although noisier aircraft types are not allowed to operate.\textsuperscript{11}

3.1.6 The runways are generally operated in segregated mode, where one runway is used for arriving aircraft and the other is used for departing aircraft. During the day, when there is a build-up of arriving aircraft held in stacks waiting to land, both runways are permitted to be used for landings to minimise delays. The hour between 06:00 and 07:00 is the busiest time for arrivals and Heathrow is permitted to land aircraft on both runways during this period. After 07:00 a maximum of 6 aircraft an hour is permitted to land on the departure runway when required.

3.1.7 Heathrow has long been at the forefront of international efforts to tackle noise from aircraft. We are proud of the fact that, despite the number of aircraft movements at the airport increasing over the years, the noise footprint from Heathrow aircraft has shrunk considerably (see Graphic 3.1 below).

\textbf{Graphic 3.1 Heathrow’s changing noise footprint}

3.2 \textbf{Capacity, delay and service standards}

\textit{The current regime}

3.2.1 Heathrow is a regulated airport and as such Heathrow’s operations are obliged to comply with licenced conditions set by the Civil Aviation Authority (CAA).

\textsuperscript{11} Any aircraft shall, after take-off, be operated in such a way that it will not cause more than 89 dBA Lmax by night (from 2300 to 0700 hours local time) and that it will not cause more than 87 dBA Lmax during the night quota period (from 2330 to 0600 hours local time). Please refer to : “https://www.aurora.nats.co.uk/htmlAIP/Publications/2019-04-25-AIRAC/html/index-en-GB.html”
3.2.2 Heathrow will not permit any early realisation of growth through additional ATMs that will have unacceptable impacts on resilience, service quality, or delay at the airport. In this chapter we set out how these aspects are currently governed and what Heathrow proposes in relation to them.

3.2.3 There is a comprehensive regime of control in place to ensure the continued efficient operation of the airport. Heathrow is obliged, for instance, to ensure **Operational Resilience**, which is defined in our operating licence as:

> “Availability in continuity of airport operation services at the Airport, particularly in times of disruption, to further the interests of users of air transport services in accordance with best practice and in a timely, efficient and economical manner”.

3.2.4 Heathrow’s performance in this respect is reported under our licence as part of our **Service Quality conditions**. The Service Quality Rebate Scheme was introduced by the CAA to identify the service standards that airlines and passengers could expect from Heathrow in return for the regulatory charges they paid. Heathrow is incentivised to maintain high levels of service. Where performance falls below a certain level, Heathrow must repay a proportion of charges levied back to the airlines. The service quality rebate scheme is a condition of Heathrow’s operating licence. Going forward, the CAA has plans to replace the Scheme with an outcomes based performance framework, although the overall principle will be similar.

3.2.5 Heathrow also sets standards in relation to **punctuality**. Punctuality is a measure of predictability, and the industry standard approach is to measure it as a percentage of flights that depart on time. For these purposes, “on time” is measured as a departure from gate within 15 minutes of the scheduled departure time (the scheduled departure time usually corresponds with the time that appears on a passenger’s ticket). Heathrow currently operates a Key Performance Indicator (KPI) to achieve 80% of departures on time. The KPI target is set each year based upon the overall network constraints and operational improvements anticipated; it is always set to be challenging to achieve.

3.2.6 Below, Graphic 3.2 shows departure punctuality of the top five London airports over the last five years. It shows that Heathrow’s punctuality performance has remained robust. This is due to Heathrow’s significant ongoing investment in resilience enablers such as new instrument landing systems, a new airport operations centre and improvements in baggage and security systems.
Another key indicator of operational performance is delay. Delay can be caused by a number of factors outside of Heathrow’s direct control including, for example, airspace restrictions along the aircraft’s route, some weather conditions impacting air traffic control procedures or aircraft technical faults. Whilst many factors are outside Heathrow’s control, one underlying factor that can influence delay is the number of aircraft using the runways and terminals over a day relative to the capacity of the airport. For this reason, the number of slots available for airlines to request is based on the defined runway and terminal capacity; which is declared by Heathrow twice a year for the summer and winter seasons.

These matters are and will continue to be closely regulated, not least through the process for slot allocation. Slots must be allocated in accordance with Regulation (EC) No. 793/2004 of the European Parliament and of the Council amending Council Regulation (EEC) No. 95/93 on common rules for the allocation of slots at Community airports. The responsibility for implementing legislation is on the member state (the UK Government).

In compliance with these regulations, Heathrow must appoint a coordinator to allocate slots to airlines using or planning to use the airport. Airport Co-ordination Limited (ACL) carries out this role for Heathrow and is required to act in a neutral, transparent and non-discriminatory way, applying relevant parameters in the allocation of slots. Airlines make requests either to move slot times or to acquire new slots directly to the co-ordinator to eliminate any bias from the airport.

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12 London City Airports 2018 annual punctuality analysis was not available and therefore excluded from the CAA 2018 reports. Please refer to the CAA website for details of the source data; https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Flight-reliability/Datasets/UK-flight-punctuality-data/
3.2.10 It is this robust process that would be used to allocate additional capacity in the flight schedules if early ATM growth is consented through the DCO. The process is in place to protect the integrity of the airport and to ensure fairness in the distribution of slots to airlines.

3.2.11 Heathrow's seasonal capacity is, therefore, agreed in advance of each season using a process involving the airlines, air traffic control, ACL and the airport. Decisions are made collaboratively based on the foreseen impact to delay. Delay criteria used in making decisions include keeping predicted average daily delay for arrivals and departures below 10 minutes and keeping peaks in delay as low as possible.

3.2.12 At the time of the grant of planning permission for Terminal 5 in 2001, Heathrow gave the following assurance:

“10 minute delay criterion: BAA (now Heathrow) will not propose or support any increase in the 10 minute average delay criterion used for the purpose of declaring runway capacity at Heathrow Airport”

3.2.13 This process and Heathrow’s commitment has worked well to drive operational resilience and reduce delays, while maximising available capacity within the current movement limit.

3.2.14 If consented, in declaring additional runway capacity for early ATM growth, Heathrow proposes to re-confirm its commitment to the runway scheduling process and delay criteria described above. This is to ensure that the resilience of the airfield continues to be protected.

3.2.15 Heathrow also proposes to phase the introduction of new capacity, and where required, to balance the introduction of new capacity between peak and off-peak periods to further protect operational resilience.

3.2.16 In addition, Heathrow also re-confirms its commitment to its Service Quality Regime and any emergent Service Quality Regime that may be introduced.

3.2.17 In order to do this, additional growth during peak periods must be accompanied by initiatives to increase operating efficiency. The following paragraphs explain how we propose this is achieved.

### 3.3 Enhancing Operational Efficiency

3.3.1 As part of our drive to continually improve Heathrow’s service quality and resilience, we have developed a range of initiatives to improve the operation of our current two runway airfield. The initiatives both improve the efficiency of the airport and enhance the connecting journey for transferring passengers. Collectively, these measures can also be used to create the capacity for early ATM growth.
3.3.2 The principal measures proposed for enhancing arrival capacity and resilience are called Independent Parallel Approaches (IPA) and enhanced Time Based Separation (eTBS) Phase 2 Pairwise Separations.

3.3.3 **Independent Parallel Approaches (IPA)** enables aircraft to arrive in parallel at busy times by the use of a modern aircraft satellite-based navigation system, called Performance Based Navigation (PBN), which allows aircraft to follow a set route with more precision and consistency. At busy times, aircraft are permitted to land on both runways at Heathrow. Currently, when this happens, an aircraft landing on the departure runway must be diagonally spaced by a specified distance from aircraft landing on the arrival runway (Graphic 3.4). To achieve this, the spacing between aircraft landing on the arrival runway has to be increased compared to when only one runway is used for landing. The introduction of IPA enables parallel arrivals (Graphic 3.5) and will increase the landing rate of the runways when aircraft are permitted to land on both runways. This will reduce delays by enabling waiting planes in stacks to be assigned more quickly to the runways.

**Graphic 3.3  Current operations – standard approach**

**Graphic 3.4  Current operations – dependent approaches**
3.3.4 IPA was described in detail in our Airspace and Future Operations Consultation (January 2019) and the feedback received has been taken into consideration in the development of early ATM growth scenarios.

3.3.5 **Enhanced Time Based Separation (eTBS) Phase 2 Pairwise** allows greater arrival runway throughput by reducing the time intervals required between compatible aircraft types on approach to Heathrow.

3.3.6 Further enhanced capacity is planned to be achieved through the combination of other measures, including the following:

3.3.7 **Arrival Management (AMAN) and Departure Management (DMAN) enhancements**: these are systems that predict and optimise the sequence in which aircraft arrive and depart Heathrow to ensure that the runways are used efficiently.

3.3.8 Optimising use of **RECAT Departures** was implemented at Heathrow in 2017 and reduced the time intervals between compatible aircraft when departing Heathrow. This enabled a higher departure rate when those aircraft are in the queue. With early ATM growth, further work is underway to embed and fully realise the existing benefits from this separation reduction.

3.3.9 Each of these measures are in active preparation or have already been implemented. Only IPA requires an airspace change process, which is currently underway.

3.3.10 The other important area of enhanced efficiency relates to **physical infrastructure improvements at the airfield**. In particular, Heathrow are already planning enhanced stand and infrastructure capacity at Terminal 5 and a

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13 RECAT stands for Wake Vortex Re-categorisation
14 The Statement of Need for IPA airspace change as accepted by the CAA is available at "http://publicapps.caa.co.uk/docs/33/20180914_HAL%20SoN_Independent%20Parallel%20Approaches.pdf"
reconfiguration of stand capacity at Terminal 3 to create more capacity for larger aircraft.

3.3.11 Collectively, these improvements will significantly increase the operational and physical capacity of the airport and create the opportunity for additional air traffic movements without undermining the efficient operation of the airport. We explain in the next chapters how we have tested this capacity and our emerging thinking in relation to the best way of implementing early ATM growth.
4. TESTING CAPACITY IMPROVEMENTS

4.1.1 In order to develop proposals for early ATM growth, it is apparent that there are a wide range of matters to take into account. These include consumer interests, stakeholder views, environmental considerations, operational effects, the number of additional movements, whether they should be introduced in phases, the type of aircraft that may be used, and the different destinations that may be served. In particular, we have tried to answer the question: *If we are to add additional movements at Heathrow, with acceptable effects on the environment, communities, airlines and passengers; what additional improvements are necessary to mitigate and enable that early ATM growth?*

4.1.2 To address all these matters in a logical way, Heathrow appointed an expert, multi-disciplinary team to develop and evaluate a range of potential early ATM growth scenarios with the aim of understanding the various effects of different growth levels.

4.1.3 The learning from those stages of work, reported below, is helping us develop preferred proposals for our DCO application which will be developed with the benefit of further detailed assessment and, particularly, subject to engagement with stakeholders and feedback from this consultation.

4.1.4 Early ATM growth was referenced in our Airspace and Future Operations Consultation (January 2019). Although no specific proposals were put forward and no consultation questions asked there was some feedback relevant to this assessment that we have considered. Generally airlines wanted to understand more about the effect of early ATM growth on the current operation of the airport and expressed concerns, for instance, at the practicality of delaying early morning arrivals and at the implications of moving existing early morning slots to later. Local residents and others were concerned about the additional environmental effects of increased movements. These factors have been taken directly into account as we have been developing our proposals.

4.2 Scenario Development

4.2.1 Heathrow’s previous preliminary analysis concluded that, as a consequence of the implementation of the improvements listed out earlier in this document, we could bring forward approximately 25,000 additional movements but we wanted to test that belief against the capacity, delay and service standards described in the previous chapter, as well as environmental requirements.

4.2.2 There are different ways in which an increase in air traffic movements can be achieved; for example, either increasing movements evenly throughout the year
(and therefore also in peak periods) or balancing growth differently between peak and off-peak periods.

4.2.3 To investigate these possibilities and their associated effects, we tested different scenarios for early ATM growth, each with different operational characteristics. It was considered sensible to assess different increments of growth at peak times from 10,000 movements in steps of additional 5,000 movements up to 30,000 movements per year.

4.2.4 The learning from this approach has helped us understand how many additional movements could be achieved acceptably and under which circumstances. It has also helped us to explore the effects of introducing early ATM growth in stages and as a combination of peak and off-peak increments.

4.2.5 In order to assess resilience and performance, it was necessary to test different peak operating scenarios and to generate example schedules identifying where the additional movements would be accommodated during the day making assumptions around their destination and origin. To narrow the analysis, we made a number of assumptions, as follows:

- no additional movements would be added to the schedule prior to 06:00 (i.e. arriving or departing at the stand or terminal before 06:00 local time)
- aircraft types for new slots were consistent with those assumed to be operating in Heathrow’s 2022 baseline forecast;
- for the purposes of evaluation, it was assumed that each scenario would not be phased but would be introduced from the outset – the effect of phasing could be judged by comparing the results between a 10,000 movement scenario and a 20,000 or 25,000 movement scenario;
- a short-haul carrier was assumed to be introduced to Terminal 2 with 4 base aircraft operating minimum turnaround times;
- on a precautionary basis in terms of capacity, it was assumed that the first scheduled arrival would be 05:30 meaning runway landing at 05:15 compared with runway landing at 04:30 currently;
- in one option it was assumed the scheduled start time of operations remained as today with the runway opening at 04:30 to test the difference; and
- Terminal 4 and Terminal 3 were assumed to remain international only terminals but some terminal occupancy reconfiguration was assumed by notionally moving some airlines between terminals.
4.2.6 Scenarios with higher growth levels during the peaks were discontinued after preliminary analysis and prior to scenario evaluation due to the impact on operational performance.

4.2.7 Using an iterative process, 11 example schedules were selected across each different growth level (i.e. 5k, 10k etc) (sometimes there was more than one scenario for each growth level) and these were then submitted to a multi-disciplinary team for evaluation. Appendix A provides a description of each of the tested scenarios.

4.2.8 Whilst we generated realistic example schedules to test, the principal effect of the DCO application would be to create the opportunity for airlines to bring forward additional flights on new routes and/or to intensify the use of existing routes. Those proposals would be regulated through the slot allocation process described in section 3.2 above and by any requirements specified in the DCO consent.

4.2.9 Appendix B provides information on the aircraft noise and air quality characteristics of each scenario, and this information formed an important part of the evaluation.

4.3 **Evaluation**

4.3.1 In general accordance with Heathrow’s scheme development process, each of the scenarios was evaluated based on 6 key topics, as follows:\textsuperscript{15}

- Community;
- Sustainability;
- Delivery;
- Operations and service;
- Business case; and
- Planning.

4.3.2 A summary of results from the evaluation is contained in Appendix C, whilst the following paragraphs identify the principal lessons learned through the evaluation process.

4.3.3 As a very broad observation, the economic and business benefits of early ATM growth increase with the higher peak growth scenarios but so do the potential impacts. Although this observation is not at all surprising, the evaluation has been

\textsuperscript{15} For these purposes Property was not engaged in the evaluation – a departure from our general approach to evaluation. Property was not considered a significant issue in relation to early ATM growth evaluation.
more useful for the detailed observations which it generated, including the following:

a. the nature of both the benefits and the impacts of different scenarios is dependent as much on the profile of the flight schedules as it is on the total number of additional movements. For example, there are some 15k, 20k and 25k example schedules that have similar noise impacts to 10k example schedules;

b. The noise impact of early growth is more sensitive to additional movements during the night (i.e. 23:00 to 07:00). As part of the early growth proposals, and as with expansion, no additional movements will be scheduled before 06:00;

c. the distribution of growth, within the flight schedules and across the year, also affects resilience, punctuality and delay. For example, the scenario which has more additional flights in the winter off peak season than in the busy summer season scored strongly in a number of the evaluations.

4.3.4 The community, sustainability and planning assessments did not support the scenario with a 04:30 runway start time (04:45 scheduled time) compared with the benefits of a 05:15 runway start (05:30 scheduled time). In this respect they were influenced by the strength of community feedback, and the inconsistency with the Airports NPS expectation that expansion would be accompanied by a scheduled night time ban of 6.5 hours. By contrast, the business and operations evaluations as well as industry feedback strongly favoured maintaining the current 04:30 runway start time to support resilience, efficiency, and mitigate delays.

4.3.5 In relation to the principal environmental effects of early ATM growth, it is important to recognise the following outcomes from evaluation:

- **Noise:** whilst noise levels increase (compared with no early ATM growth) with additional movements, for all scenarios our early stage evaluation suggests that total noise impact from the airport operating with early ATM growth is relatively small and consistent with the policy requirements of the Airports NPS, for example, for aircraft noise effects to be better than the 2013 baseline. The change in noise exposure as a result of an additional 25,000 movements is expected to be a negligible change i.e. less than 0.2 decibels and therefore not significant;\(^\text{16}\)

- **Air Quality:** the provisional analysis shows that the impact of up to 25,000 additional ATMs is relatively limited in terms of its impact on annual mean NO2 concentrations at receptors. The maximum increase at any location is expected to be 0.5 µG/m3; a level of change which is consistent with the Airports NPS

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\(^{16}\) See Appendix B. Further detail can be found in the PEIR
policy and which would be regarded as “slight adverse” and classified as “not significant” in an Environmental Statement.\footnote{See Appendix B. Further detail can be found in the PEIR.}

- **Surface Access**: early modelling outputs indicate that the increased passenger numbers associated with early ATM growth from 2022 can be accommodated by the available capacity on the transport network around Heathrow, prior to the delivery of Heathrow’s passenger public transport mode share and colleague car trip targets in the Airports NPS. The higher levels of early ATM growth may require Heathrow to implement elements of its expansion *Surface Access Proposals*.

4.3.6 More information is contained in *Appendix C* and a detailed assessment of the effects of early ATM growth is contained within the *Preliminary Environmental Information Report (PEIR)* published as part of this consultation.

4.3.7 Overall, the results from the evaluation indicate that 25,000 additional movements per year can be introduced consistently with the environmental policies of the Airports NPS. It is important to ensure that any impacts are mitigated and controlled and these matters are addressed in the next chapter of this document.

4.3.8 A similar conclusion can be drawn in relation to the impact of early ATM growth on airport resilience and service. Our work has generated confidence that additional growth can be achieved within performance levels in compliance with the current resilience and service processes described in section 3.2 once the necessary capacity enablers (described in Chapter 3) are successfully implemented.
5. OUR EMERGING PROPOSALS AND MITIGATION

5.1.1 The results from the evaluation of the early ATM growth scenarios indicate that benefits of early ATM growth assuming a 25,000 additional movements per year scenario, can be realised consistently with the environmental policies of the Airports NPS. Our work undertaken so far shows, in particular, that early ATM growth at this scale can be accommodated with relatively limited incremental noise and air quality effects. In addition, conclusions from this assessment suggest that capacity enablers can minimise impacts on the airport’s operations so that we can maintain our commitments to service quality and resilience to passengers and airlines.

5.1.2 This chapter explains our current proposals and how we will finalise them for our DCO application.

5.2 Service commitments

5.2.1 We propose to re-affirm as part of our DCO application Heathrow’s commitment to the current runway scheduling process, including the current delay criteria, and to our Service Quality Regime – as explained in section 3.2 above.

5.2.2 This approach will incentivise Heathrow to continue to identify, develop and invest in enhanced operational and physical proposals at the airport to ensure that early ATM growth can be accommodated without impacting on the efficiency of the airport’s operation.

5.2.3 In order to achieve this, it may be necessary to phase the implementation of early ATM growth so that additional air traffic movements are only introduced when required capacity enhancements are in place.

5.2.4 Rather than a pre-set proposal for a given level of growth in each year, Heathrow’s proposal and commitment would be to implement early ATM growth only in so far as it is consistent with our commitments to service quality and resilience, which includes our committed assurance in relation to underlying delay caused by the number of allocated movements. These commitments would act as rules or as parameters within which early ATM growth would be consented.

5.2.5 Our emerging thinking is that these commitments would allow a first phase of an additional 15,000 movements from late 2022, approximately 12 months after the grant of DCO consent and then a further 10,000 movements so that we would have achieved 25,000 movements by 2025. This would allow time for the implementation of operational mitigation measures to enable the full capacity of early ATM growth to be released.
5.2.6 The evaluations to date suggest that it would be beneficial to invest in additional airfield infrastructure to remove pinch points that could otherwise impact on operational performance. These additional operational measures relate to relatively small scale airfield infrastructure enhancements which will be proposed if necessary within the DCO application.

5.2.7 Detailed work to assess and define these physical improvements will form part of the next phases of our study but they may include:

- building improved hold points for aircraft accessing and leaving the runways;
- dual Code C taxiways for Terminal 5;
- additional stand infrastructure for Terminal 3; and
- improved linkages between Terminals 2 and 3.

5.2.8 We will also test the need and benefits of investing in enhancements to baggage and passenger processing infrastructure within terminals and enhanced services.

5.3 Environment and community

5.3.1 In addition, we will put in place all necessary measures to ensure that the impacts of early ATM growth on the environment and communities are acceptable and consistent with the policies of the Airports NPS.

5.3.2 We have set out in Future Runway Operations document our preferred proposals for the night time regime for Expansion and the rigorous assessment of those proposals. They include a formal ban on scheduled night flights from 23:00 to 05:30 (scheduled times). We are still developing and assessing whether any transitional measures are required to facilitate movement to that night time regime before the new runway is operational, particularly as regards the implementation of the ban in the evening and any quota system. However, given that early ATM growth may lead to additional flights in the 06:00 to 07:00 period (classified as within the night period), we confirm that our preferred proposal for consultation and further assessment is that the early morning ban (05:30 scheduled time) should apply from the outset of early ATM growth. This approach is supported by our community and environmental assessments.

5.3.3 The enhanced Noise Insulation Scheme, which has been announced as part of our expansion proposals would be in place prior to early ATM growth.

5.3.4 We are also developing a detailed Surface Access Proposal to ensure that a three runway Heathrow meets the transport requirements of the Airports NPS. The Strategy will apply once expansion is consented and will therefore also include the early ATM growth phase. The elements of the Strategy will be implemented.
proportionately to mitigate impacts as they arise. For example, our proposals for emissions charging for vehicles to access the airport may be implemented before the first date of operation of early ATM growth.

5.3.5 Further, we propose that our strategy for Environmentally Managed Growth of the airport into the long term also commences from the onset of early ATM growth. That strategy is explained in our separate document *Future Runway Operations and Environmentally Managed Growth*. That document sets out a comprehensive basis for managing the growth of the airport to ensure that its effects always remain within the boundaries of those considered acceptable by the Airports NPS. That strategy involves binding commitments from Heathrow to monitor, measure and report our environmental performance to an Independent Scrutiny Panel who would hold Heathrow to account against its environmental commitments and ensure continued compliance with the policies of the Airports NPS. As explained in those documents, this would include a Noise Envelope, as well as commitments for air quality, carbon and surface access. Specific limits would be defined which early ATM growth would need to observe.

5.3.6 In combination with our commitment to service quality and resilience, we would establish a framework within which early ATM growth can only proceed where its effects are demonstrably acceptable on our communities.

5.4 **Next Steps**

5.4.1 In the previous chapters we have explained how we aim to develop the detail of our proposals for early ATM growth to include them in our DCO application next year. That process will involve further modelling, an in-depth environmental assessment, the development of any airfield infrastructure improvements that may be necessary and more detailed definition around our commitments to operational and environmental controls.

5.4.2 All of those matters will be worked up through engagement with stakeholders but we would also like to receive your views on these emerging proposals so we can consider them in the next phase of this study.

5.4.3 This consultation is an important opportunity for you to have your say on the future of Heathrow and a series of questions are set out in our *Airport Expansion Consultation Feedback Form*. 
APPENDIX A: EARLY ATM GROWTH SCENARIO FACTSHEET

This appendix provides a high-level overview of key characteristics reflecting each scenario developed for the purposes of the evaluation in order to test and assure the amounts of early ATM growth feasible ahead of third runway opening.

The scenarios represent a range of possibilities of how Heathrow may grow once the cap is lifted. These will be developed further once we have received feedback on and agreed our preferred approach to early ATM growth.

The following table (Figure A 1) shows the number of new flights added in each hour for each scenario (arrivals/departures). All times shown are scheduled local times. The intensity of colours (lighter to darker) is just a visual aid to reflect the increasing number of additional flights.

Figure A 1  New flights assumed in each example schedule per hour

<table>
<thead>
<tr>
<th>Movements:</th>
<th>Start Time: 05:30</th>
<th>05:30</th>
<th>05:30</th>
<th>05:30</th>
<th>04:45</th>
<th>05:30</th>
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<td>50</td>
</tr>
<tr>
<td>4-hour Evening</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>11</td>
<td>10</td>
<td>17</td>
<td>14</td>
<td>10</td>
<td>17</td>
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</tbody>
</table>

These flights are assumed to be geographically distributed as shown in the following figure.
Figure A 2  Geographical assumptions for new flights
APPENDIX B: A SUMMARY OF THE AIRCRAFT NOISE AND AIR QUALITY EFFECTS OF EARLY ATM GROWTH

Early ATM Growth – air noise

Introduction
As described in the main body of the text, the period of early ATM growth coincides with a number of airspace changes which Heathrow is currently planning for:

1. Independent Parallel Approaches (IPA)
3. Easterly alternation
4. 3.2 degree slightly steeper approaches (SSA)

These airspace changes will be addressed through a series of Airspace Change Proposals and associated consents. These consents are separate to the consents for early ATM growth which will be through the Development Consent Order (DCO).

The assessment presented within the Preliminary Environmental Information Report (PEIR) adopts an assessment year of 2025 for early ATM growth. The PEIR assessment is based on the ‘do something’ scenario detailed below. The Environmental Statement to be prepared and submitted as part of the DCO application will be based on the scenario developed following further technical study and consultation feedback. This has been selected as it considers a scenario whereby all of these changes have occurred with the maximum level of early ATM growth in place. We set out below the scenarios we have considered.

These have been selected in order that the effect of early ATM growth can be isolated from the effects of the airspace changes listed above. The scenarios are:

- a ‘base case’ in 2021 i.e. before the release of the early ATM growth with the airport operating at 480,000 ATMs per annum and prior to the planned airspace and operational changes
- a ‘do minimum’ in 2025 i.e. without the early ATM growth (so the airport is still operating at 480,000 ATMs per annum) and with the planned airspace and operational changes; and
- a ‘do-something’ in 2025 i.e. with 25,000 ATMs. For the purposes of the assessment, a single 25K scenario has been utilised, each of the ‘do-something’ options, early ATM growth schedules have been provided and used as the basis of the analysis described in this Appendix.
Early ATM growth could occur at different levels from 2022 and at points where there could be airspace and operation changes. However, given that the airspace changes are outside of the DCO Project, the ‘point when the airport’s noise impact is forecast to be highest’ (the assessment required by the Airports NPS (paragraph 5.52) will fall when early ATM growth has reached its highest level (i.e. 2025).

The noise impact has been addressed qualitatively within this analysis based on the findings of noise exposure modelling undertaken for the scenarios described. This modelling has been undertaken in a consistent manner to the aircraft noise assessments presented within Chapter 17: Noise of the PEIR, with Annexes B and G of the PEIR Appendix 17.1 providing the assumptions and methodology which has been relied on for the modelling. The modelling has been based on schedules including and excluding the early ATM growth effectively presenting scheduled operations for a 480,000 movement i.e. without growth and 505,000 movement operation i.e. with growth. With early ATM growth, the schedule assumes that scheduled operations commence at 05:30 and finish at 23:00.

Considering a scenario with an increase of 25,000 ATMs with all of the planned airspace changes in place gives a representative, high level assessment of the potential noise impact. This form of assessment is reflected in the assessment of early ATM growth provided within the PEIR.

**Assessment**

Considering a scenario with an increase of 25,000 ATMs with all of the planned airspace changes in place gives a representative, high level assessment of the potential noise impact. This form of assessment is reflected in the assessment of early ATM growth provided within the PEIR.

A review of the schedules for the early ATM growth has been undertaken in order to identify how operations at different times of the day could change. For the purposes of the PEIR, a scenario was used with three additional departures in the early morning period i.e. pre-07:00 and with an additional 69 aircraft movements split relatively evenly between arrivals and departures over the period 07:00 to 23:00. How the early ATM growth is scheduled is an important consideration because any additional noise occurring during the night i.e. 23:00 to 07:00 is more sensitive with respect to health and quality of life.

The noise modelling has concentrated on daytime and night-time noise exposure using the LAeq,16hr and LAeq,8hr (night time) metrics as specified in UK noise and aviation policy and guidance. The results of the modelling for each of the scenarios described above are set out in Table 1 below. This analysis presents populations exposed to levels above the Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL) for both day and night-time periods. In addition to the scenarios considered above, a comparison against 2013 is also presented. This is relevant as the Airports National Policy Statement (Airports NPS) requires that “noise mitigation measures should ensure the impact of aircraft noise is limited and, where possible, reduced compared to the
2013 baseline assessed by the Airports Commission.” (Paragraph 5.58). This is presented within the Airports NPS with reference to the 2013 baseline for the 54 dB $\text{L}_{\text{Aeq},16\text{h}}$ noise contour.

**Figure B 1  Noise Exposure Results**

<table>
<thead>
<tr>
<th>Daytime</th>
<th>2013</th>
<th>2021</th>
<th>2025</th>
<th>2025</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Base Case</td>
<td>Without Early ATM growth</td>
<td>With Early ATM growth</td>
<td></td>
</tr>
<tr>
<td>&gt; LOAEL 51 dB $\text{L}_{\text{Aeq},16\text{hr}}$</td>
<td>1,206,300</td>
<td>1,051,150</td>
<td>1,051,100</td>
<td>1,091,400</td>
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<tr>
<td>&gt; 54 dB $\text{L}_{\text{Aeq},16\text{hr}}$</td>
<td>616,100</td>
<td>495,350</td>
<td>478,550</td>
<td>510,250</td>
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<tr>
<td>&gt; SOAEL 63 dB $\text{L}_{\text{Aeq},16\text{hr}}$</td>
<td>67,100</td>
<td>43,826</td>
<td>51,150$^{18}$</td>
<td>54,450$^{18}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Night time</th>
<th>2013</th>
<th>2021</th>
<th>2025</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base Case</td>
<td>Without Early ATM growth</td>
<td>With Early ATM growth</td>
<td></td>
</tr>
<tr>
<td>&gt; LOAEL 45 dB $\text{L}_{\text{Aeq},8\text{hr}}$</td>
<td>998,300</td>
<td>732,700</td>
<td>664,900</td>
<td>666,900</td>
</tr>
<tr>
<td>&gt; SOAEL 55 dB $\text{L}_{\text{Aeq},8\text{hr}}$</td>
<td>103,500</td>
<td>53,400</td>
<td>54,000$^{18}$</td>
<td>54,300$^{18}$</td>
</tr>
</tbody>
</table>

Whilst this analysis is subject to a range of assumptions in relation to Heathrow’s future airspace arrangements, as described within Appendix 17.1 Annexes B and G of the PEIR, the analysis shows that without early ATM growth, the planned airspace and operational changes will on their own result in changes to the distribution and levels of noise exposure around Heathrow. Figure B 1 shows that in all future years i.e. 2021 and 2025, noise exposure is forecast to be lower than in 2013, inclusive of early ATM growth demonstrating that early ATM growth can be delivered whilst meeting the requirements of the Airports NPS.

As presented within the PEIR, the assessment of early ATM growth concludes that there would be negligible change (up to 0.2 dB increase) at all locations as a result of early ATM growth in air traffic movements. As such, no likely significant noise effects are identified due to the early ATM growth of air traffic movements. This conclusion is supported by 18 Mitigation and compensation (noise insulation) measures will avoid adverse effects on health and quality of life. Noise compensation measures for the DCO Project are set out in the draft DCO Project Noise Insulation Policy. Noise compensation measures associated with airspace change (that is not related to the DCO Project) will be offered in line with Government expectations as set out in Airspace Policy (Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace: Oct 2017)
Figure B2, which reproduces the noise exposure contours relied on for the PEIR for scenarios in 2025 with and without the early ATM growth in place.

Figure B 2 2025 Noise contours

Figure B1 shows that with early ATM growth (0.2 dB increase in noise), approximately 40,000 more people would be exposed to noise above the daytime LOAEL (in the context of 1,050,000 people exposed above LOAEL without early ATM growth) and around 3,300 people exposed to levels above the daytime SOAEL (in the context of 479,000 people exposed above SOAEL without early ATM growth). Where the new exposure above SOAEL occurs, mitigation and compensation (noise insulation) measures will avoid significant adverse effects on health and quality of life. Noise compensation measures for the DCO Project are set out in the draft DCO Project Noise Insulation Policy.

Conclusion
The analysis shows that early ATM growth will result in a negligible 0.2 dB increase in noise exposure compared to a scenario where it does not occur. No adverse likely significant effects are therefore forecast. Analysis shows that this early ATM growth would therefore result in around 3,300 people being newly exposed to levels above the daytime SOAEL (in the context of 479,000 people exposed above SOAEL without early ATM growth). The resulting significant adverse effects on health and quality of life will be avoided through mitigation and compensation (noise insulation) measures as set out in the draft DCO Project Noise Insulation Policy.

These conclusions are based on the assumptions and the schedules adopted for this assessment that will be verified for the purposes of the DCO application.
Early ATM Growth – air quality

Introduction
This note summarises the approach and the preliminary results of the assessment of the likely significant effects of early ATM growth in Air Transport Movements (ATMs) with respect to local air quality.

Consideration has been given to all airport-related emissions associated with delivering additional capacity, including those from airside support equipment, emissions from aircraft in the landing and take-off cycle (LTO) and emissions from all airport-related road traffic, including freight, service vehicles, colleagues and passengers.

The legislative framework for air quality consists of legally enforceable EU limit values set in the European directive on ambient air quality and cleaner air for Europe. In the Heathrow area, and the UK in general, concentrations of nitrogen dioxide (NO2) are an important focus, as there are locations where they exceed the EU limit values and UK Air Quality Objectives (AQOs). Concentrations of particulate matter (PM10 and PM2.5) have been considered in full in the PEIR, but this assessment of early ATM growth has focused on NO2 concentrations and the potential for exceedances of limit values and AQOs.

Dispersion modelling has been used to predict the change in airport-related emissions of nitrogen oxides (NOX) and the subsequent changes in concentrations of NO2 associated with the proposed increase in up to 25,000 ATMs in 2025.

Assessment
Air quality in the Heathrow area has been routinely assessed for the last two decades, through both ambient air quality monitoring and modelling studies. The Heathrow Air Quality Working Group (a partnership between Heathrow, London Borough of Hillingdon, London Borough of Hounslow, Slough Borough Council, Spelthorne Borough Council, the GLA, TfL and the Environment Agency) works collaboratively to monitor, share and publish data from 22 continuous air quality monitoring stations within approximately 20 kilometres (km) of Heathrow. The data collected can be found on the Heathrow Airwatch (2019) website and show that concentrations of particulate matter (PM10 and PM2.5) do not exceed the annual AQOs. Annual mean NO2 concentrations exceed the annual mean AQO (40µg/m3) at two roadside monitoring sites (London Hillingdon and Hillingdon Hayes), but the concentration is below 40µg/m3 at other roadside sites, and background locations.

The results of the analysis show that, in isolation, the impact of up to 25,000 additional ATMs by 2025 is fairly limited in terms of its impact on annual mean NO2 concentrations at receptors around the airport. The maximum increase in annual mean NO2 concentrations at receptors near the airport from an additional 25,000 ATMs is expected to be a maximum...
of around 0.5 µg/m³; the annual mean AQO and EU limit value is 40 µg/m³. The most affected receptors are those nearest to and downwind of the airport boundary that are affected by emissions from both aircraft and airport-related road traffic. In isolation, this level of change in annual mean NO₂ concentrations will most likely be not significant and is unlikely to affect compliance with legal air quality obligations. The impact of less than 25,000 ATMs assumed in 2022, 2023 and 2024 will be proportionately less than 0.5 µg/m³ (i.e. the contribution from 5,000 ATMs would be expected to be less than 0.1 µg/m³, which would be defined as negligible in air quality terms).

However, impacts of early ATM growth need to be fully considered in the context of all DCO Project-related construction activities. It will be important to have regard to the cumulative effects of emissions from construction vehicle movements and any other sources. These matters are addressed in the PEIR.

Air quality is generally expected to improve with time, due, for example, to more stringent emissions standards for motor vehicles. The risk of exceedance of AQOs and EU limits will be dependent on a number of external and inter-related parameters, including the rate at which baseline concentrations of NO₂ reduce as wider UK and London policy measures are introduced.

Emissions from aircraft are a relatively small contributor to local air quality around Heathrow, and in particular, concentrations of NO₂ and particulate matter. Although the number of ATMs will increase, emissions per passenger (and fuel consumption) are expected to reduce over time as a result of technology improvement rates linked to commercial and regulatory requirements.

If emissions from other sources reduce in line with government forecasts, then this should create the headroom for early ATM growth from 2022. However, if air quality around Heathrow does not improve as rapidly as forecast, then additional mitigation proposals may be required to be brought forward by Heathrow in order that early ATM growth to 25,000 ATMs can be accommodated within air quality limits. Mitigation would most likely include surface access interventions to reduce construction and operational road traffic on the local road network.
APPENDIX C: EVALUATION RESULTS AND KEY FINDINGS BY DISCIPLINE

This appendix summarises conclusions reached by all the disciplines that participated in the assessment of the scenarios that were generated for evaluation purposes in this phase of the development of proposals for the implementation of early ATM growth as described previously in this document.

For reference these scenarios and flight schedules are listed out below:

- Scenario 1: 10K ATM growth peak schedules with 05:30 start
  - Schedule A
- Scenario 2: 15K ATM growth peak schedules with 05:30 start
  - Schedule B
  - Schedule C
- Scenario 3: 20K ATM growth peak schedules with 04:45 start
  - Schedule D
- Scenario 4: 20K ATM growth peak schedules with 05:30 start
  - Schedule E
  - Schedule F
- Scenario 5: 25K ATM growth peak schedules with 05:30 start
  - Schedule G
  - Schedule H
  - Schedule I
  - Schedule J
- Scenario 6: 20K ATM growth scenario with additional off-season growth

Note: The times shown above are local, scheduled times; as opposed to landing/take-off times. For the purposes of this study it was assumed that the arrivals would operate on the runway no sooner than 05:15 or 04:30 (Scenario 3 only) depending on the scenario above.
Operations and service

Airfield and Airspace
The results indicated that it will be possible to facilitate early ATM growth whilst retaining acceptable levels of performance, although the full scale of early ATM growth will depend on the extent of additional capacity that can be enabled. It was noted that there appeared to be different performance impacts from the same volume of ATM growth, indicating that schedule performance is heavily dependent on the way growth is introduced through the base schedule.

Overall, Scenarios 1 and 2 performed relatively well against the criteria and some of the peak schedules in Scenarios 3 and 4 seemed achievable within acceptable performance levels, although additional mitigations would be required to implement the scale of peak growth presented by Scenario 5.

Scenario 6 (proposal with additional off-season growth) scored well and could be developed further to test its feasibility given its relatively improved performance compared with other scenarios with the same level of growth.

Baggage
Scenario 6 was assessed as the better performing proposal, as it would deliver a higher number of ATMs than Scenario 2 putting the same level of pressure on the baggage system at peak times. This level of pressure would be manageable within the required levels of system reliability.

It was recommended that early ATM growth flight schedules are optimised in the next phase of this work to test whether additional ATMs can be introduced at more optimal times throughout the day to better balance the demand on the baggage systems.

Passenger Experience
Based on the process of evaluation there were two scenarios which offered a better growth option from a passenger experience perspective: Scenario 1 (example schedule “A”) and Scenario 6 (proposal with additional off-season growth). In both growth scenarios the likelihood of passenger delay and detrimental service quality caused by congestion is reduced.

Across the poorer scoring scenarios, it was suggested that the likelihood of delay could be improved or mitigated with new technologies (dynamic signage, flexible infrastructure, etc.) as well as with increased staff to help in areas of high passenger demand. Additionally, impact on passenger experience could be reduced if quieter periods of the day within each terminal are used more efficiently.
**Hub Connectivity**

In line with the assessment completed by Passenger Experience, there were two scenarios which offered a more favourable growth option from a Hub Connectivity perspective, Scenario 1 (example schedule “A”) and Scenario 6 (proposal with additional off-season growth). Those two growth scenarios presented, without considering additional mitigations, the lowest level of potential flight arrival delay and congestion within the terminal environment.

Proposals with the widest operating window, minimal arrival delays and minimised airfield and terminal congestion score better due to their contributions towards the delivery of a high quality, predictable and reliable hub connectivity product.

**Surface Access**

The existing surface access modelling forecast outputs indicated that Heathrow can accommodate additional ATMs from 2022.

Generally, options which propose lower ATM growth performed better against the Surface Access criteria because of the relief this provides to the transport network; particularly during expansion-related construction. The best rated early ATM growth scenario was therefore Scenario 1 (example schedule “A”) as this proposes the lowest increase in ATM growth compared to all other options whilst also proposing the latest start time (05:30).

It was suggested that the early deployment of some of the interventions proposed within the *Surface Access Proposals* would likely be needed to mitigate any adverse effects.

**Engineering Infrastructure for Operations and Service**

The results suggested that higher ATM growth scenarios would put more relative pressure on the aviation fuel and engineering infrastructure due to the consequential effects on existing terminal buildings and fuel storage facilities, which may require improvements for higher levels of growth.

**Community**

Overall, in terms of relative performance, scenarios with fewer additional movements scored better, and in particular the flight schedules with fewer movements at the most sensitive times of the day. In addition, feedback from communities and their representatives leaned towards scenarios and flight schedules that have lesser effects on the schedule ban for night flights and offer predictability of respite. As a result:

- 10k and 15k peak ATM growth scenarios performed generally better (example schedules “A”, “B” and “C”),
The example schedule “D” scored poorly in terms of effects on predictable respite due to earlier start,

The example schedule “I” scored poorly as a result of relative increase in the number of early flights.

**Sustainability**

**Noise**

The main conclusion reached after the assessment of these scenarios was that the more growth that occurs the greater the increase in noise impacts compared with doing nothing. However, compared with today it was deemed likely that all early ATM growth scenarios will meet our public commitments and the NPS required comparisons with 2013. It was concluded that example flight schedules “A”, “C”, “F” and “I” performed better in comparison with their “peer” group schedules, but without a detailed evaluation of the final mitigation package that position could be subject to change.

From a community perspective, reducing the increase in operations during the most sensitive time periods and/or limiting these to quieter aircraft types would be preferred.

**Air Quality**

The results of the analysis showed that the effects of up to 25,000 additional ATMs by 2025 were fairly limited in terms of their impact on annual mean NO2 concentrations at receptors. The maximum increase observed through all scenarios was expected to be less than 0.5 µg/m3 at all locations, which in isolation would be consistent with the Airports NPS policy and regarded as “slight adverse” and classified as “not significant” in an Environmental Statement.

In general, the evaluation confirmed that options that lead to slower growth and less vehicles on the road network have the lowest impact on air quality, however the cumulative effects of construction traffic and early ATM growth require further detailed consideration during the next phase of this work. Construction-related mitigation is likely to be necessary to address these cumulative effects in areas that will experience a combination of construction related road traffic movements and additional road traffic associated with early ATM growth.

**Carbon Emissions**

The Carbon assessment demonstrated, based upon a comparative and primarily qualitative evaluation, that the scenarios that would introduce the greatest volume of ATMs have the biggest impact in terms of Carbon Emissions (Scenario 5).

On the other hand, results showed that Scenario 1 had minimum impact as it introduces the lowest increase in ATMs and the majority of the additional departure flights are
assumed to serve European destinations. Of the Scenario 2 options, the example schedule “B” was anticipated to perform slightly more favourably than the example schedule “C” because there is a greater proportion of additional movements serving European destinations. As stated previously in section 4.2 of this document, the destinations of the new flights have been assumed for modelling purposes only. Notwithstanding the above observations, the Heathrow Expansion Programme will ultimately be judged based upon the long-term carbon emission in 2050, given that the carbon targets and budgets against which its Greenhouse gases (GHGs) impacts will be considered are set to 2050. Therefore, ATM growth pre-2027 is unlikely to materially influence Heathrow’s ability to meet tests set in the NPS. The scale of early ATM growth prior to 2027 will, however, influence cumulative emissions over the period to 2050. See Appendix B for a more detailed summary of the aircraft noise and air quality effects of early ATM growth.

**Delivery**

All scenarios were assumed to have little or no differentiator from a delivery point of view apart from the potential shortening of the assumed working window (engineering hours) proposed by Scenario 3.

**Business Case**

**Aeronautical revenue**

Scenario 5 (example schedules “G”, “H”, “I” and “J”) was recommended ahead of all other scenarios as it generates the most additional ATMs and consequently has the most favourable impact on aeronautical charges.

This benefit would translate directly into helping to deliver Heathrow’s challenge to deliver expansion at close to current charges. Early ATM growth is an important component in delivering our obligation to ensure that expansion is cost efficient and sustainable, minimising costs to airlines, passengers and freight owners.

**Airline strategy**

With all the scenarios scoring similarly across most of the metrics, Scenario 3 (example flight schedule “D”) stood out comparatively as the best performer due to its earlier operational start-up time (04:30 runway), which would not compromise the ability of airlines to operate early morning arrivals compared to today.

Ensuring minimal impact on early morning arrivals is a priority from the airlines’ perspective due to negative impact on their ability to generate revenue from early morning arriving flights, and to connect passengers from these flights onto the first wave of European departures.
Non-aero commercial and terminals land use
From a qualitative perspective Non-Aero Commercial scored better options which have higher ATM growth due to the increase in passenger throughput, which ultimately results in more revenue.

Scenario 3 was the best rated proposal from a Non-Aero Commercial perspective due to the high ATM increase (20k) compared to other options and the retention of existing operating hours (04:45 vs 05:30). Keeping opening time at 04:45 would limit the impact early ATM growth has on Cargo and would protect morning Cargo peaks from long-haul arrivals.

Terminals and stands capacity
The evaluation of these scenarios led to the conclusion that a 25K ATM growth scenario (example flight schedules “G” and “J”) could be introduced with minimal impact on terminal peak hours, stand capacity and pier service.

The assessment undertaken suggested that there was no clear correlation between increasing the number of ATMs and the impact on the peak hours in the terminals, the stand demand or the pier service and that it was possible to accommodate 25,000 additional ATMs within the capacity declared.

OPEX (Operational Expenditure)
Based on the process of evaluation there is only a very marginal difference from an OPEX perspective between the scenarios due to the relative change in additional ATMs spread across terminals and hours of the day.

Consumer benefit
The proposal that scored comparatively better in the evaluation was Scenario 3, as this maintains the existing 04:30 runway start time while bringing in an additional 20K ATMs, which will increase competition through the potential for new entrants on some routes.

A delay in early morning arrivals would likely result in less choice of desirable flights for consumers and would put additional operational pressures on airlines which could ultimately impact consumers.

Planning
The best overall performing proposals from a planning consent perspective were example flight schedule “I” and “J”. Both provided 25,000 ATMs but performed better than other options for the same level of growth in environmental (noise) terms. They provide a balance between business case benefits and having better than average environmental impacts.
The worst performing scenario was considered to be Scenario 3 (20K ATM growth peak schedules with 04:45 start). Whilst a 04:30 runway start time is the best performing from a consumer benefit perspective, the 04:30 runway start was considered unacceptable from a wider noise or community perspective, taking also into account its impact on the community and the conflict with Heathrow’s preferred approach of a 05:30 start time.

It was recommended that careful consideration of cumulative impacts with expansion-related construction is necessary. Whilst the Air Quality subject identified that there are no significant differentiators, construction operations could have a significant influence on air quality relative to objective limits which, without mitigation, could be exacerbated by early ATM growth.

Careful consideration would also need to be given to the timing of mitigation and controls.
Find all the consultation information on our website aec.heathrowconsultation.com

Email any questions about the consultation to info@heathrowconsultation.com

There are lots of ways you can contact us or find out more

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