

Aircraft movements, fleet mix and noise quota usage at Gatwick, Heathrow and Stansted

CAP 3013

Published by the Civil Aviation Authority 2024

Civil Aviation Authority
Aviation House
Beehive Ring Road
Crawley
West Sussex
RH6 0YR

You can copy and use this text but please ensure you always use the most up to date version, credit the CAA and use it in context so as not to be misleading,

First published July 2024

Enquiries regarding the content of this publication should be addressed to: noise@caa.co.uk

The latest version of this document is available in electronic format at: www.caa.co.uk/CAP3013

Contents

Contents	3
Chapter 1	5
Introduction	5
Chapter 2	6
Methodology	6
Chapter 3	7
Gatwick Airport	7
Aircraft movements and noise quota	7
Fleet mix	9
Distance flown	11
Chapter 4	13
Heathrow Airport	13
Aircraft movements and noise quota	13
Fleet mix	15
Distance flown	18
Chapter 5	20
Stansted Airport	20
Aircraft movements and noise quota	20
Fleet mix	22
Distance flown	24
Chapter 6	26
Summary	26
The Quota Count (QC) system	27
Aircraft type categories (not exhaustive)	30
Wide-body	30
New Generation Wide-body	30
Narrow-body	30
New Generation Narrow-body	31

Other (including Business and Regional Jets)	31
Glossary	32

Chapter 1

Introduction

- 1.1 This report provides a summary of the numbers of aircraft movements, the aircraft fleet mix and noise quota usage at Gatwick, Heathrow and Stansted airports between 2019 and 2023. The study was commissioned by the Department for Transport to understand and monitor trends in the aviation sector at the three London airports.
- 1.2 This report follows on from CAP 2128, which was published by the CAA to understand the impact of the Covid-19 pandemic on aircraft operations and the possible knock-on effect on noise around the airports¹. Whereas CAP 2128 reported daily numbers of aircraft movements and related data for the period 2019 to 2022, this report provides summary results by calendar year and includes new data for 2023, with less focus on the immediate impacts of the pandemic.
- 1.3 Chapter 2 of this report describes the methodology used to determine and classify aircraft movements for this study. Chapters 3, 4 and 5 provide a summary of the results for Gatwick, Heathrow and Stansted, respectively, which can be read standalone for the airport of interest. An overall summary is provided in Chapter 6.
- 1.4 For a wider review of the environmental performance of the UK aviation industry, readers are directed to the UK Aviation Environmental Review 2023 which provides an objective account of the state of environmental protection relating to civil aviation in the UK².

¹ [CAP 2128](#), *Aircraft movements, fleet mix and noise quota usage at Gatwick, Heathrow and Stansted*, CAA, October 2023

² [CAP 2620](#), *UK Aviation Environmental Review 2023*, CAA, December 2023

Chapter 2

Methodology

- 2.1 Aircraft movement information for this study was extracted from the Gatwick, Heathrow and Stansted Noise and Track-Keeping (NTK) systems. The airport NTK systems provide information such as aircraft type, registration (tail number) and airport of origin or destination for each movement. Quota Count (QC) classifications for aircraft operating during the night quota period (23:30–06:00) are also recorded by each airport. Appendix A provides further details of the QC scheme.
- 2.2 In this report, noise quota is defined as the sum of the QC classifications of all aircraft movements over a specified period. Although originally designed to regulate aircraft noise at night, the noise quota scheme is considered a useful proxy for the amount of noise made around an airport over any period of time since it takes account of both the numbers of movements and the noise levels of the operations. Calculating the average QC per movement can also demonstrate the extent to which aircraft fleets have become quieter over time.
- 2.3 For Heathrow, QC classifications for the overwhelming majority of aircraft operating outside of the night quota period are also recorded. However, QC classifications for a proportion of daytime operations at Gatwick and Stansted are not routinely determined. For such cases in this study it was necessary to estimate the QC classifications, either by using best judgement based on knowledge of the specific aircraft type or by calculating average QC values for similar aircraft types in the known fleet.
- 2.4 The distance flown for each movement was estimated from the great-circle distance to the origin or destination airport³. Aircraft that are flying further will generally be heavier because they are carrying more fuel and will therefore be lower, on average, over the ground after take-off (all other things being equal)⁴.
- 2.5 The term 'New Generation' is used in this report to identify particular types of aircraft within an individual manufacturer's product range that incorporate the latest engine and/or airframe technologies designed to make aircraft quieter and typically more fuel efficient. Appendix B provides details of these aircraft.

³ The great-circle distance (or direct route length) will be slightly shorter than the actual distance flown.

⁴ For a long-range aircraft in particular, a substantial proportion of the mass is fuel, not passengers or cargo.

Chapter 3

Gatwick Airport

Aircraft movements and noise quota

- 3.1 Figures 1, 2 and 3 present the annual numbers of aircraft movements at Gatwick between 2019 and 2023 for the following periods, respectively:
- 16 hour day, 07:00–23:00
 - 8 hour night, 23:00–07:00
 - 6.5 hour night, 23:30–06:00
- 3.2 Also shown in each figure are the corresponding annual noise quotas and average QCs per movement calculated for each year. The results show a significant reduction in the numbers of movements and associated quota usage at Gatwick in 2020 and 2021 as a result of the Covid-19 pandemic.
- 3.3 In 2023, aircraft movements during the daytime period at Gatwick recovered to 89 percent of the level in 2019. By comparison, the associated noise quota for 2023 reached 79 percent of the pre-pandemic level, indicating that the average movement at Gatwick during the daytime was slightly quieter in 2023 compared to 2019⁵. This is evident in Figure 1 by the slightly lower average QC per movement of 0.47 in 2023 compared to 0.52 in 2019.
- 3.4 Conversely, night-time movements at Gatwick recovered to a greater extent compared to daytime by 2023. During the 8 hour night period (Figure 2), aircraft movements in 2023 reached 98 percent of the pre-pandemic level. Moreover, during the 6.5 hour night period (Figure 3), aircraft movements in 2023 exceeded those in 2019 by more than 10 percent. Despite this exceedence, the total noise quota during the 6.5 hour night in 2023 remained more than 10 percent below the pre-pandemic level due to quieter aircraft.
- 3.5 The results in Figures 2 and 3 show an overall reduction in the average QC per movement at night between 2019 and 2023. Between 2019 and 2023 the average QC per movement during the night was also consistently lower than during the day.

⁵ All other things being equal, a 20 percent reduction in total noise quota is approximately equivalent to a 1 dB reduction in average noise exposure.

Figure 1 Annual movements at Gatwick, 16 hour day

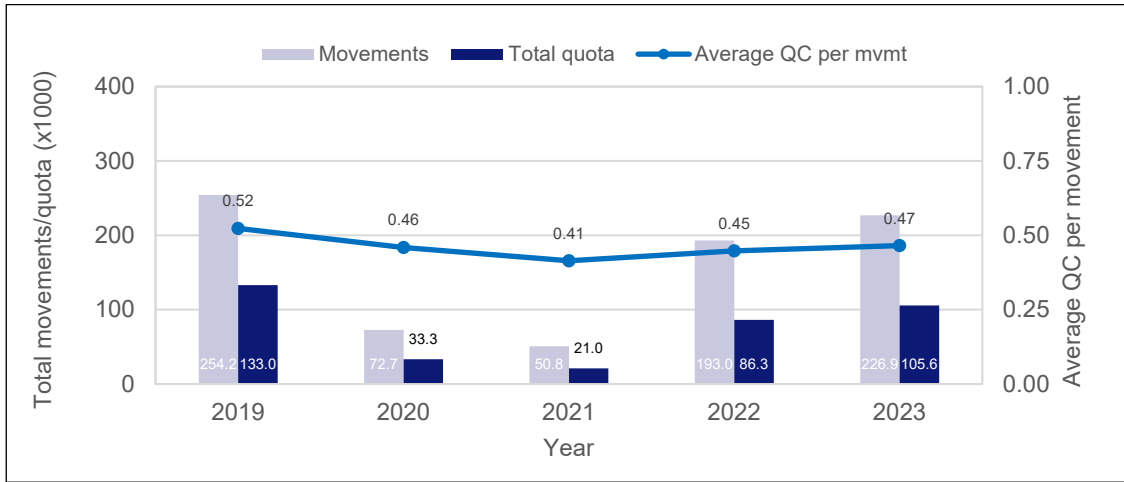


Figure 2 Annual movements at Gatwick, 8 hour night

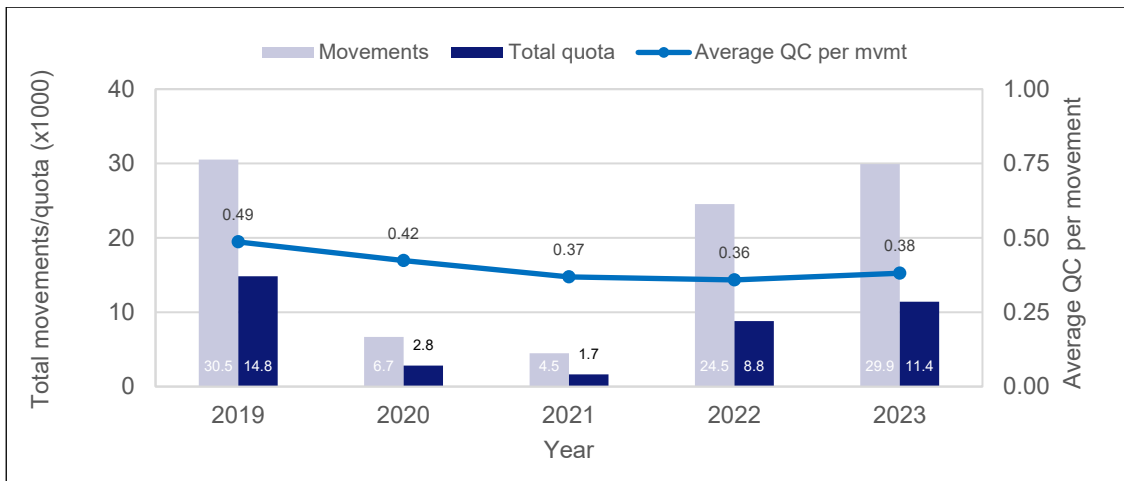
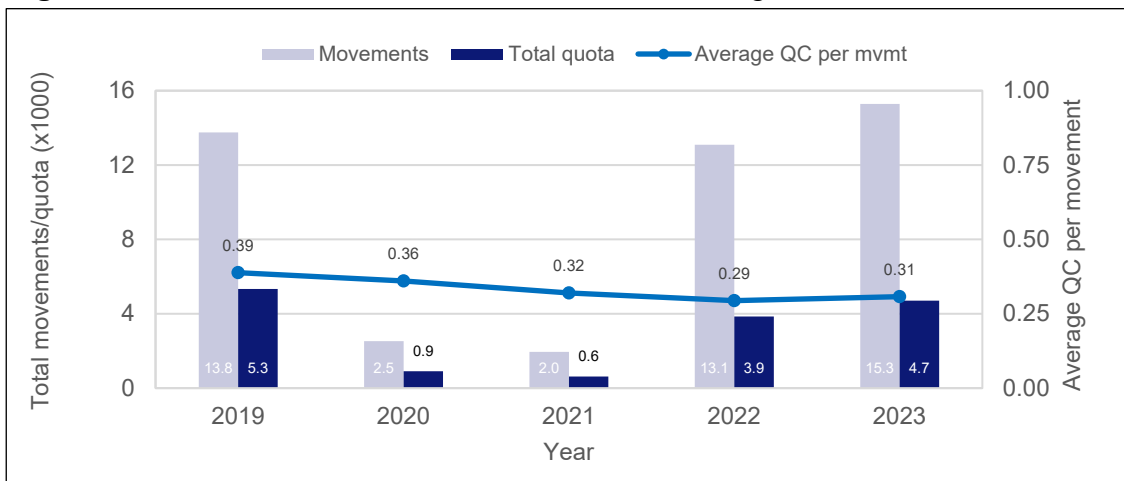


Figure 3 Annual movements at Gatwick, 6.5 hour night



Fleet mix

- 3.6 Figures 4, 5 and 6 show the percentages of different aircraft types operating at Gatwick between 2019 and 2023 during the 16 hour day, 8 hour night and 6.5 hour night periods, respectively. In each figure, aircraft movements have been grouped into the following broad categories of aircraft based on size and, where applicable, the level of aircraft noise reduction technology:
- Wide-body
 - ‘New Generation’ Wide-body
 - Narrow-body
 - ‘New Generation’ Narrow-body
 - Other
- 3.7 A summary of aircraft types covered by each category is provided in Appendix B. When reviewing the results in Figures 4 to 6, readers should also note the significant reductions in the numbers of movements that occurred during 2020 and 2021 (Figures 1 to 3).
- 3.8 It is evident from the results that narrow-body aircraft in general dominate the fleet at Gatwick, typically accounting for around 90 percent of all aircraft movements. The results also show that since 2020, New Generation narrow-body aircraft (such as the A320neo) have accounted for a greater proportion of the overall narrow-body fleet, particularly during the night period. This proportion is expected to increase further over the coming years as airlines continue to replace older aircraft in their fleets with newer, quieter designs.
- 3.9 For example, easyJet is the dominant operator at Gatwick, with a fleet of Airbus A320 and A320neo family aircraft that account for approximately half of all operations at the airport. By the end of 2023, newer A320neo family aircraft made up approximately 27 percent of easyJet’s UK-registered fleet⁶. In December 2023 easyJet confirmed a new order for 157 additional A320neo family aircraft as part of its ongoing fleet replacement programme, comprising of 56 A320neo and 101 A321neo aircraft to be delivered between FY29 and FY34. In addition, 35 A320neo aircraft ordered previously would now be converted into larger A321neos⁷.

⁶ <https://www.caa.co.uk/aircraft-register/g-info/>

⁷ <https://mediacentre.easyjet.com/story/16519/easyjet-confirms-order-for-157-airbus-aircraft>

Figure 4 Aircraft type categories at Gatwick, 16 hour day

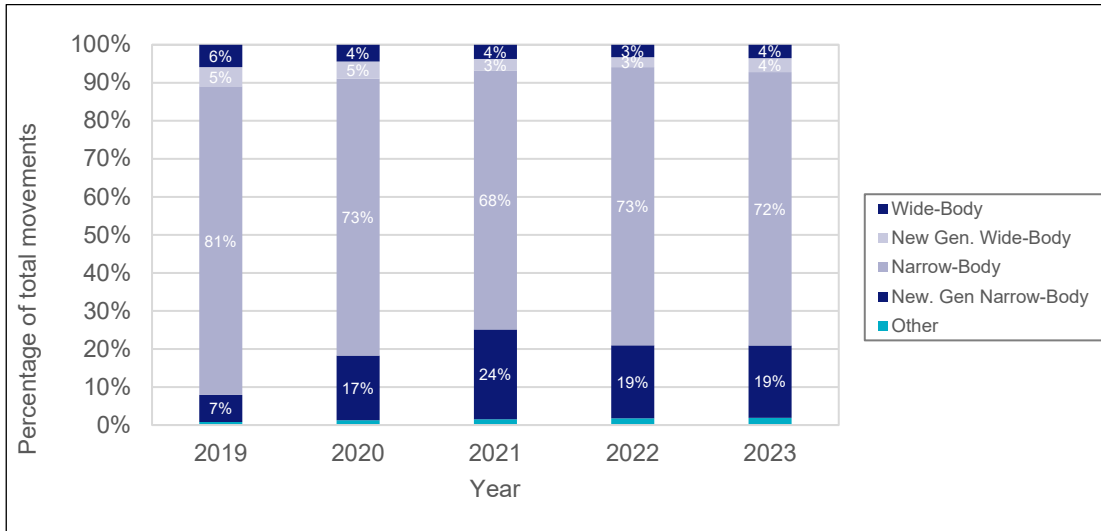


Figure 5 Aircraft type categories at Gatwick, 8 hour night

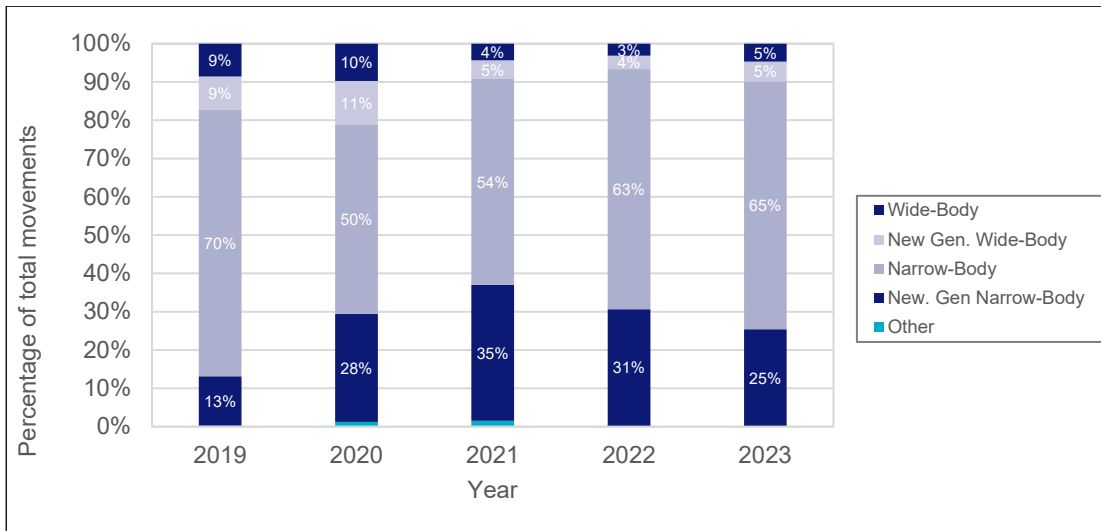
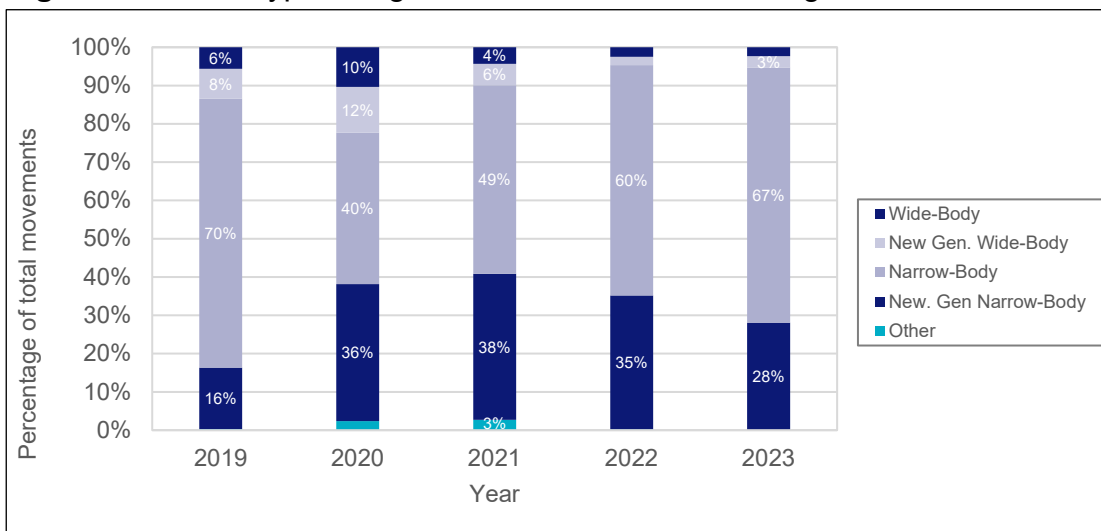


Figure 6 Aircraft type categories at Gatwick, 6.5 hour night



Note: Values less than 3% are not labelled.

Distance flown

- 3.11 To provide insight on the distances flown by aircraft operating from Gatwick, Figures 7, 8 and 9 show the percentages of different route categories flown between 2019 and 2023 during the 16 hour day, 8 hour night and 6.5 hour night, respectively. In each figure, aircraft movements have been grouped as follows:
- Short-haul flights under 1,500 km (<810 NM)
 - Medium-haul flights between 1,500 and 3,500 km (810–1,890 NM)
 - Long-haul flights over 3,500 km (>1,890 NM)
- 3.12 While the results vary somewhat between the day and night periods, the overall trend within each period has been relatively consistent since 2019.
- 3.13 During the 16 hour day, the majority of aircraft at Gatwick operated on short-haul routes, followed by a smaller proportion of aircraft flying medium-haul routes (with a minority flying long-haul). However, during the night the majority of aircraft at Gatwick (largely comprised of narrow-body types) tended to operate on medium-haul routes, with a smaller proportion flying short-haul.

Figure 7 Route categories flown at Gatwick, 16 hour day

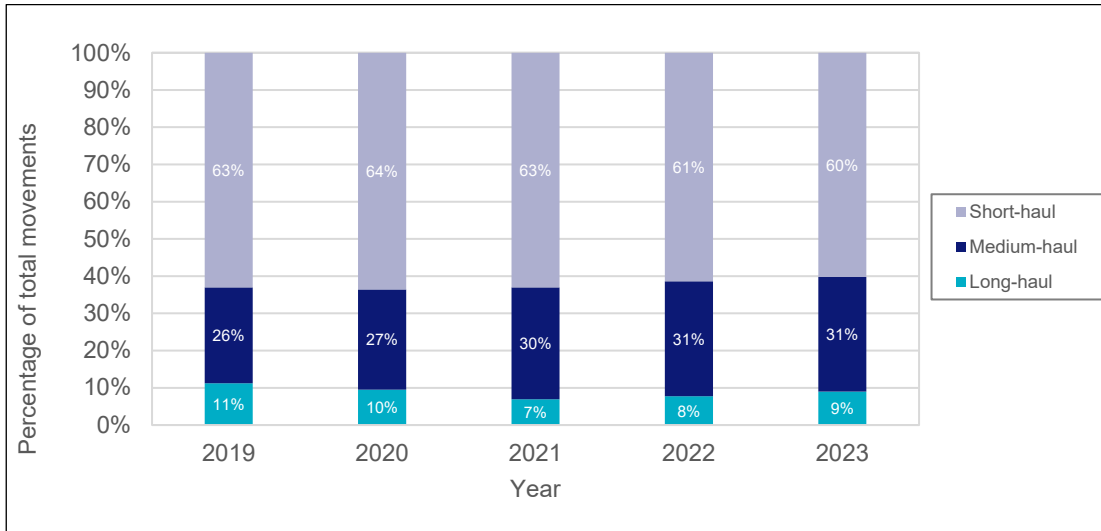


Figure 8 Route categories flown at Gatwick, 8 hour night

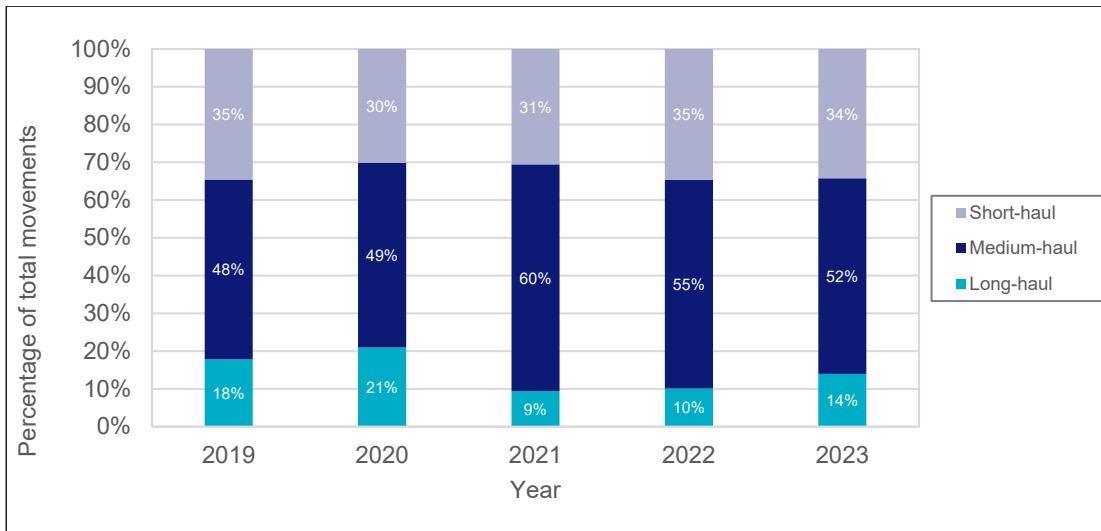
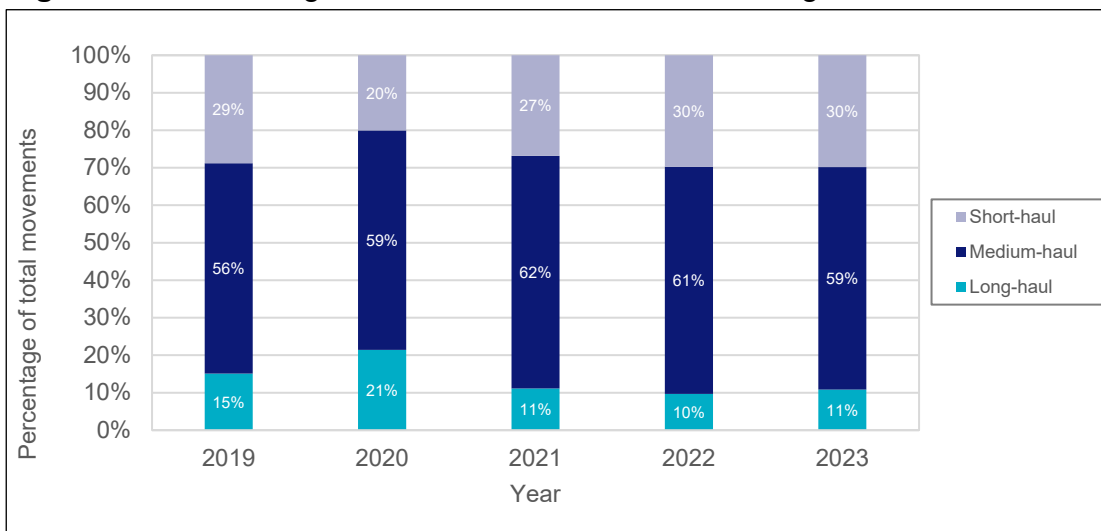


Figure 9 Route categories flown at Gatwick, 6.5 hour night



Chapter 4

Heathrow Airport

Aircraft movements and noise quota

- 4.1 Figures 10, 11 and 12 present the annual numbers of aircraft movements at Heathrow between 2019 and 2023 for the following periods, respectively:
- 16 hour day, 07:00–23:00
 - 8 hour night, 23:00–07:00
 - 6.5 hour night, 23:30–06:00
- 4.2 Also shown in each figure are the corresponding annual noise quotas and average QCs per movement calculated for each year. The results show a significant reduction in the numbers of movements and associated quota usage at Heathrow in 2020 and 2021 as a result of the Covid-19 pandemic.
- 4.3 In 2023, aircraft movements during the daytime period at Heathrow recovered to 95 percent of the level in 2019. By comparison, the associated noise quota for 2023 reached 80 percent of the pre-pandemic level, indicating that the average movement at Heathrow during the daytime was slightly quieter in 2023 compared to 2019⁸. This is evident from the overall reduction in average QC per movement between 2019 (0.68) and 2023 (0.57) shown in Figure 10.
- 4.4 Aircraft movements during the 8 hour night period at Heathrow in 2023 recovered to 98 percent of the pre-pandemic level (Figure 11). However, the associated noise quota during only reached 72 percent of the pre-pandemic level. During the 6.5 hour night period (Figure 12), aircraft movements in 2023 recovered to approximately 92 percent of the level in 2019, whereas the associated noise quota only reached 68 percent of the pre-pandemic level.
- 4.5 In terms of average QC per movement, the night-time results in Figures 11 and 12 show a similar trend to the daytime results, with overall reductions in average QC per movement between 2019 and 2023.

⁸ All other things being equal, a 20 percent reduction in total noise quota is approximately equivalent to a 1 dB reduction in average noise exposure.

Figure 10 Annual movements at Heathrow, 16 hour day

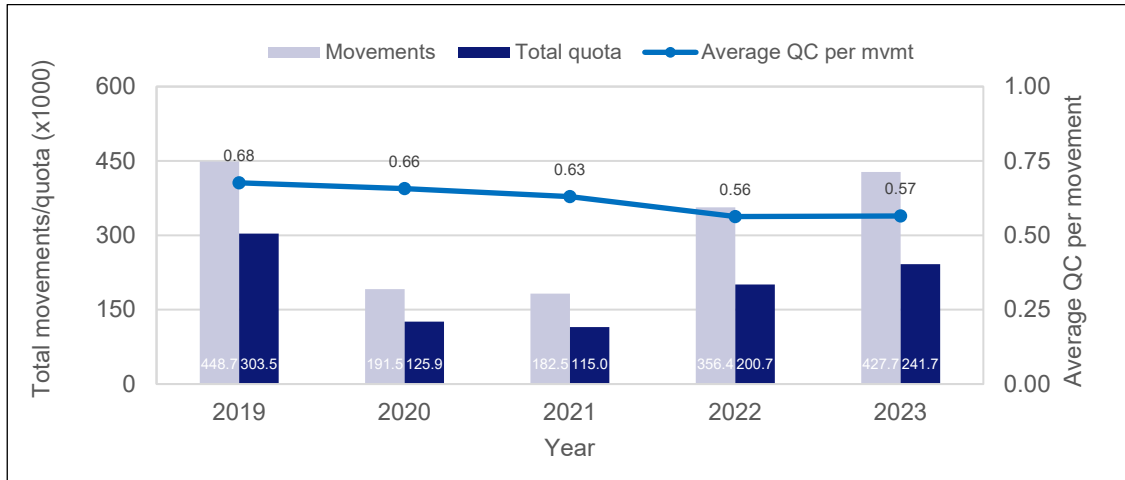


Figure 11 Annual movements at Heathrow, 8 hour night

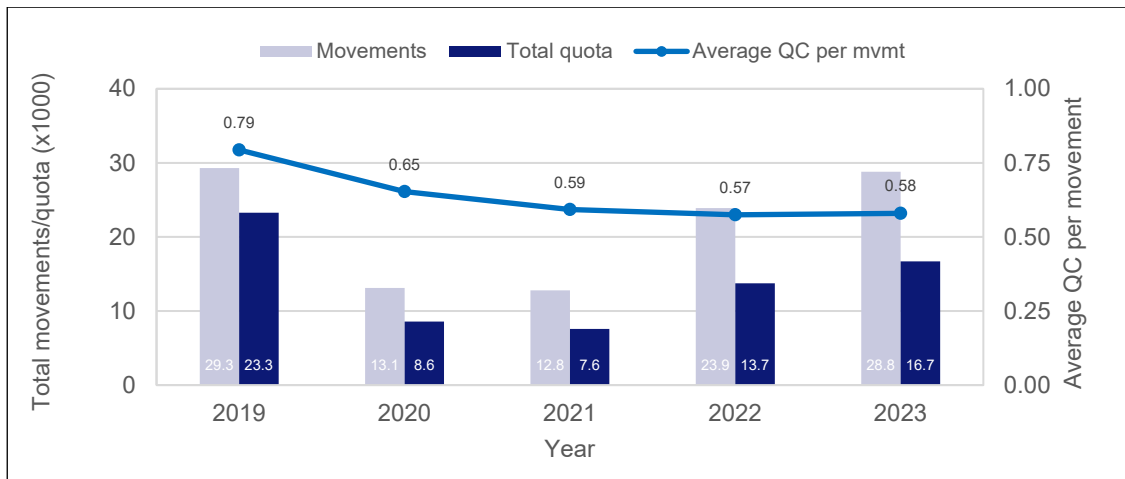
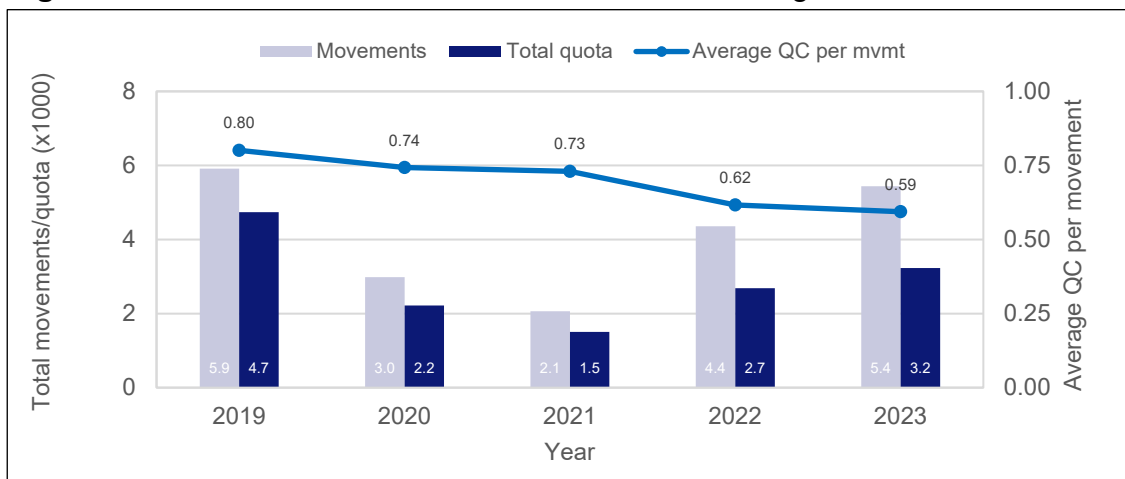


Figure 12 Annual movements at Heathrow, 6.5 hour night



Fleet mix

- 4.6 Figures 13, 14 and 15 show the percentages of different aircraft types operating at Heathrow between 2019 and 2023 during the 16 hour day, 8 hour night and 6.5 hour night periods, respectively. In each figure, aircraft movements have been grouped into the following broad categories of aircraft based on size and, where applicable, the level of aircraft noise reduction technology:
- Wide-body
 - ‘New Generation’ Wide-body
 - Narrow-body
 - ‘New Generation’ Narrow-body
 - Other
- 4.7 A summary of aircraft types covered by each category is provided in Appendix B. When reviewing the results in Figures 13 to 15, readers should also note the significant reductions in the numbers of movements that occurred during 2020 and 2021 (Figures 10 to 12).
- 4.8 The results show that while narrow-body aircraft at Heathrow tend to dominate the fleet during the 16 hour day (accounting for around 60 percent of movements), the fleet is dominated by wide-body aircraft during the night. The results also show that in 2023, New Generation aircraft accounted for a greater proportion of fleets in the 16 hour day and 8 hour night compared to 2019. This trend is expected to continue over the coming years at Heathrow, as airlines continue to replace older aircraft in their fleets with newer, quieter designs.
- 4.9 For example, British Airways (Heathrow’s largest operator) has taken delivery of 18 new A350-1000s since 2019⁹ and over the same period Virgin Atlantic has taken delivery of 12 new A350-1000s. Virgin Atlantic currently operates five A330neos with a further three to be delivered during 2024, four more by the end of 2026 and seven more by Q1 2028¹⁰.
- 4.10 In addition, British Airways currently has 12 B787-8s, 18 B787-9s and eight B787-10s in its fleet (with four more B787-10s to be delivered by the end of 2024). In July 2023, IAG (the parent company of British Airways) announced that it had converted six Boeing B787-10 options held by British Airways into firm

⁹ <https://www.caa.co.uk/aircraft-register/g-info/>

¹⁰ <https://corporate.virginatlantic.com/gb/en/media/press-releases/virgin-atlantic-completes-fleet-transformation.html>

orders, to be delivered in 2025 and 2026 and taking the airline's overall B787-10 fleet to 18¹¹.

- 4.11 The most notable new-generation aircraft type expected to enter service in the next few years is the wide-body Boeing 777X (B777-8 and B777-9 models). Several airlines at Heathrow currently have orders for the new aircraft, including British Airways, Emirates, Singapore and Qatar Airlines. While originally anticipated to enter worldwide airline service in 2020, delays to the B777X certification test program have now pushed its expected entry into worldwide commercial service to 2025¹². In February 2023 IAG reported that British Airways will now receive its 18 B777-9 deliveries from 2026 to 2028¹³.
- 4.12 Finally, it is also noted that since 2022, there has been a slightly greater percentage of narrow-body aircraft in the fleet during the 6.5 hour night period compared to previous years (Figure 15). This was due largely to an increase in late running daytime flights arriving or departing after 23:30. However, some of the increase in the percentage of New Generation narrow-body aircraft was due to the introduction in 2022 of a new scheduled A321neo service by JetBlue¹⁴.

¹¹ <https://www.iairgroup.com/media/a1qckjow/iag-h1-2023-financial-results.pdf>

¹² <https://investors.boeing.com/investors/news/press-release-details/2022/Boeing-Reports-First-Quarter-Results/default.aspx>

¹³ <https://www.iairgroup.com/media/0tipxgai/annual-report-and-accounts-2022.pdf>

¹⁴ In August 2022, JetBlue introduced a daily A321neo service between Heathrow and Boston. During the winter period, its arrival into Heathrow is scheduled during the night quota period (before 06:00 local time).

Figure 13 Aircraft type categories at Heathrow, 16 hour day

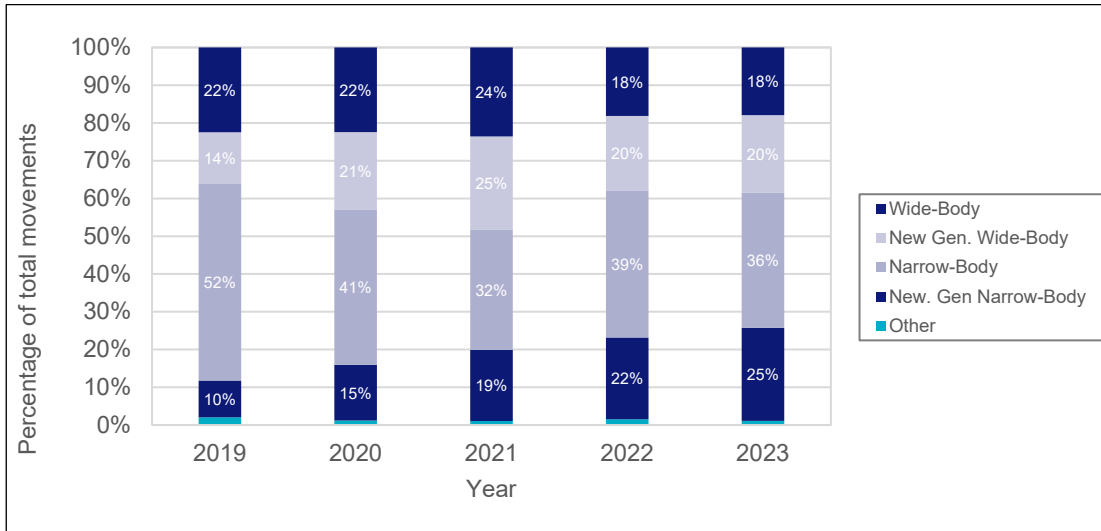


Figure 14 Aircraft type categories at Heathrow, 8 hour night

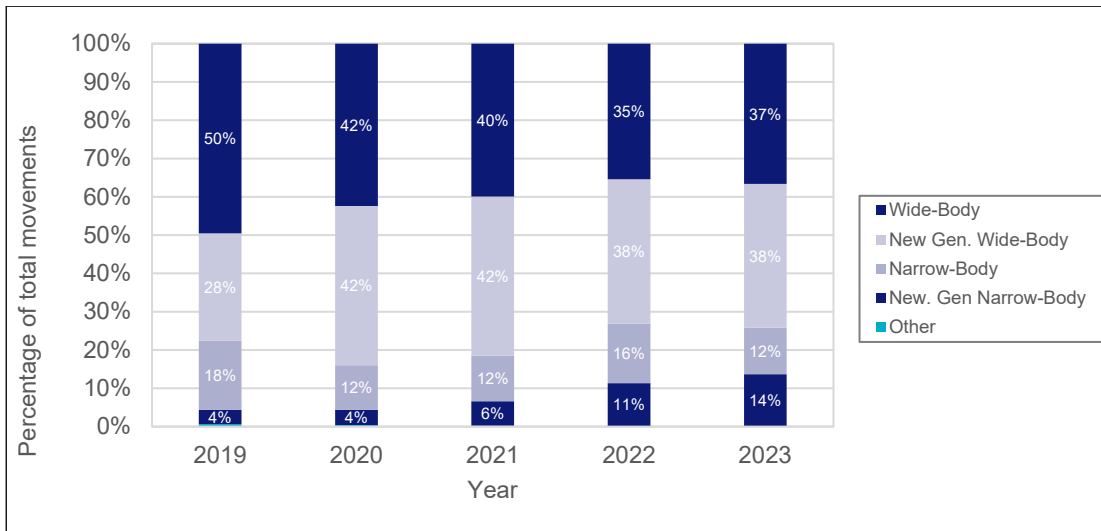
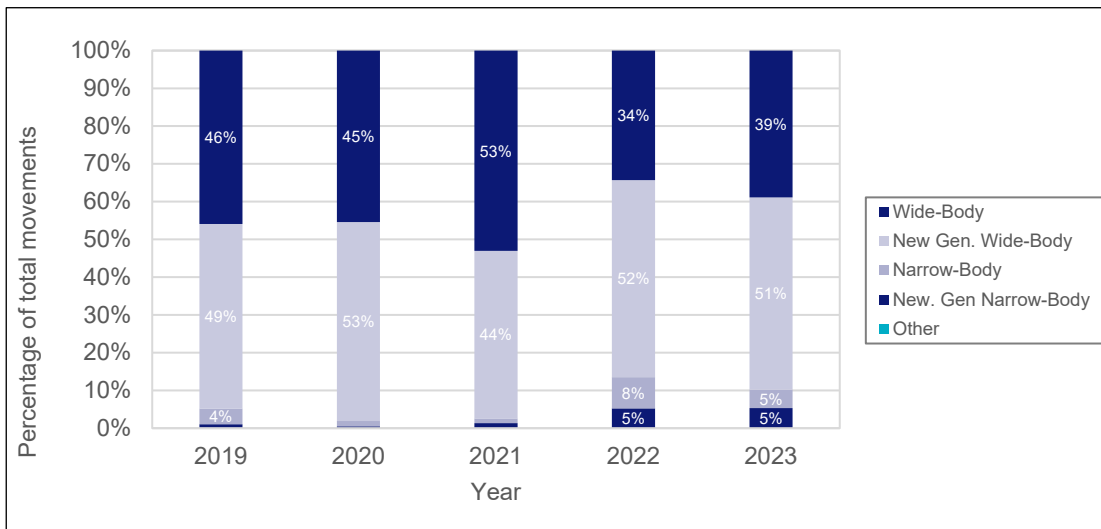


Figure 15 Aircraft type categories at Heathrow, 6.5 hour night



Note: Values less than 3% are not labelled.

Distance flown

- 4.13 To provide insight on the distances flown by aircraft operating from Heathrow, Figures 16, 17 and 18 show the percentages of different route categories flown between 2019 and 2023 during the 16 hour day, 8 hour night and 6.5 hour night, respectively. In each figure, aircraft movements have been grouped as follows:
- Short-haul flights under 1,500 km (<810 NM)
 - Medium-haul flights between 1,500 and 3,500 km (810–1,890 NM)
 - Long-haul flights over 3,500 km (>1,890 NM)
- 4.14 While the results vary somewhat between the day and night periods, the overall trend within each period since 2019 has been relatively consistent.
- 4.15 During the 16 hour day, approximately 50 percent of aircraft at Heathrow operated on short-haul routes, followed by a smaller proportion of aircraft flying long-haul routes (with a minority flying medium-haul). However, during both the 8 hour and 6.5 hour night periods, the significant majority of aircraft at Heathrow operated on long-haul routes (which were largely comprised of wide-body types).

Figure 16 Route categories flown at Heathrow, 16 hour day

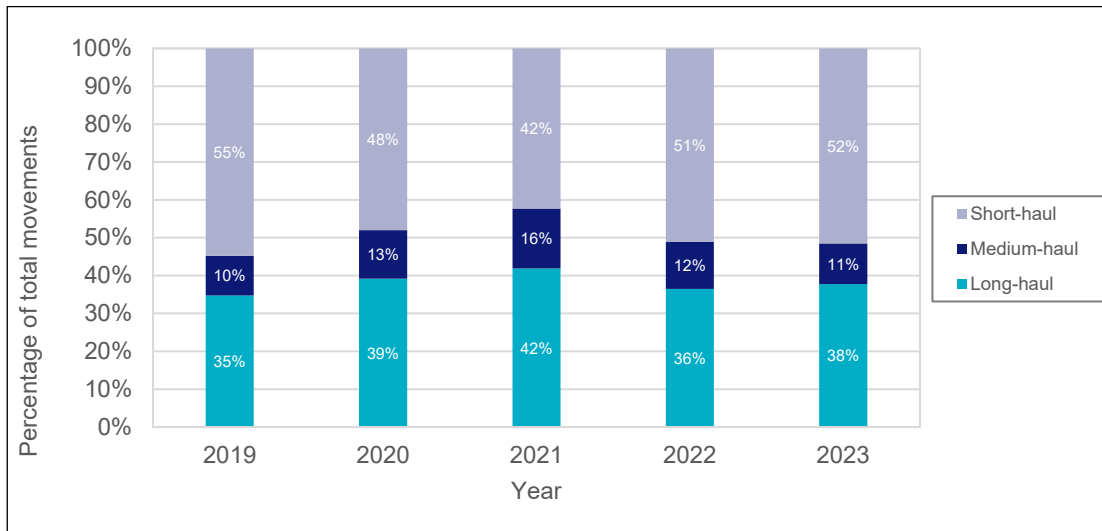


Figure 17 Route categories flown at Heathrow, 8 hour night

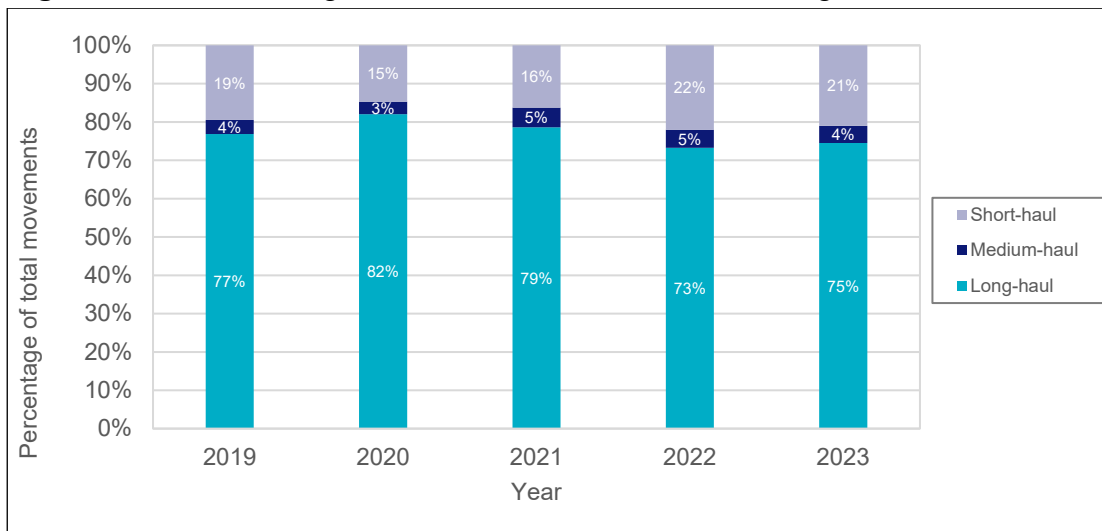
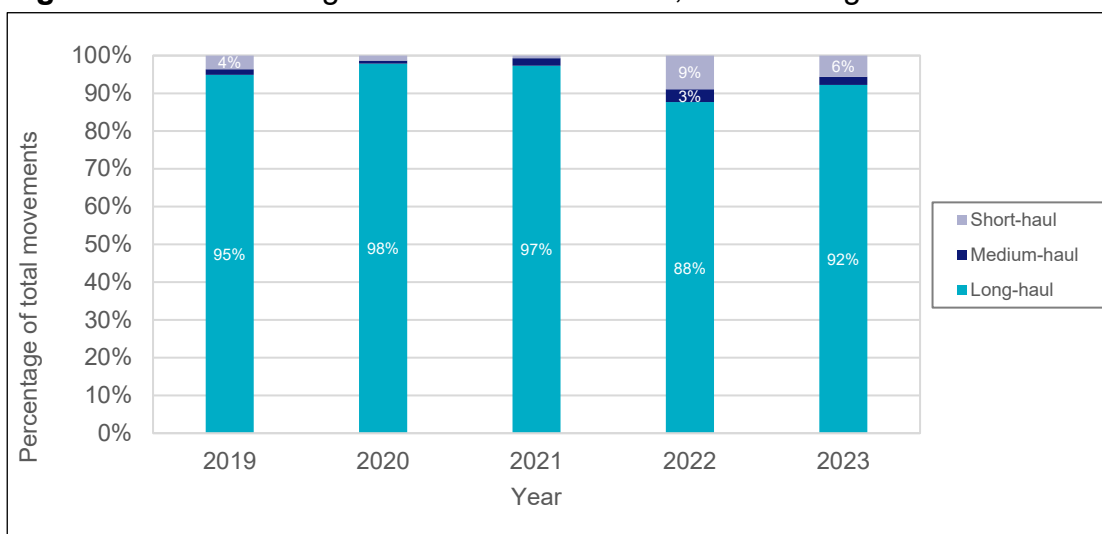


Figure 18 Route categories flown at Heathrow, 6.5 hour night



Note: Values less than 3% are not labelled.

Chapter 5

Stansted Airport

Aircraft movements and noise quota

- 5.1 Figures 19, 20 and 21 present the annual numbers of aircraft movements at Stansted between 2019 and 2023 for the following periods, respectively:
- 16 hour day, 07:00–23:00
 - 8 hour night, 23:00–07:00
 - 6.5 hour night, 23:30–06:00
- 5.2 Also shown in each figure are the corresponding annual noise quotas and average QCs per movement calculated for each year. The results show a significant reduction in the numbers of movements and associated quota usage at Stansted in 2020 and 2021 as a result of the Covid-19 pandemic.
- 5.3 The results also show that in 2020, the average QC per movement during the day and night periods temporarily increased. This was due to the significant reduction in the numbers of quieter narrow-body types at Stansted following the initial UK lockdown in March 2020, resulting in a temporary increase in the proportion of larger (and relatively noisier) wide-body types in the remaining fleet, the majority of which were freighter aircraft.
- 5.4 In 2023, aircraft movements during the daytime at Stansted recovered to approximately 97 percent of the level in 2019. By comparison, the associated noise quota for 2023 reached 90 percent of the pre-pandemic level, indicating that the average movement at Stansted during the daytime was slightly quieter in 2023 compared to 2019¹⁵. This is evident in Figure 19 by the slightly lower average QC per movement of 0.48 in 2023 compared to 0.52 in 2019.
- 5.5 Figures 20 and 21 show that annual night-time movements at Stansted during 2022 and 2023 slightly exceeded movement numbers in 2019. During the 6.5 hour night period in particular (Figure 21), annual aircraft movements in 2022 exceeded those of 2019 by more than 10 percent, with a 6 percent increase in the associated noise quota. The average QCs per movement during the night periods in 2022 and 2023, on the other hand, were both lower than in 2019.

¹⁵ All other things being equal, a 10 percent reduction in total noise quota is approximately equivalent to a 0.5 dB reduction in average noise exposure.

Figure 19 Annual movements at Stansted, 16 hour day

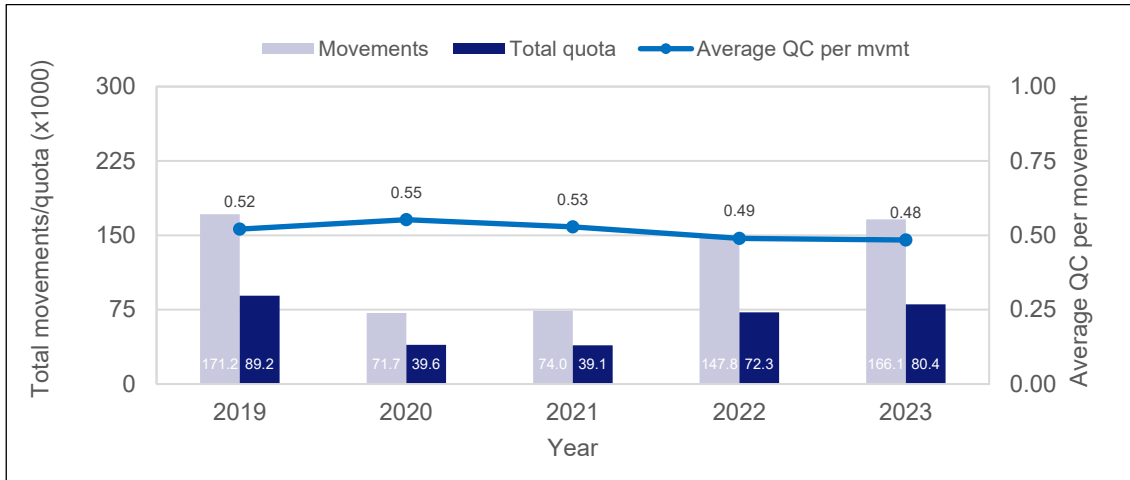


Figure 20 Annual movements at Stansted, 8 hour night

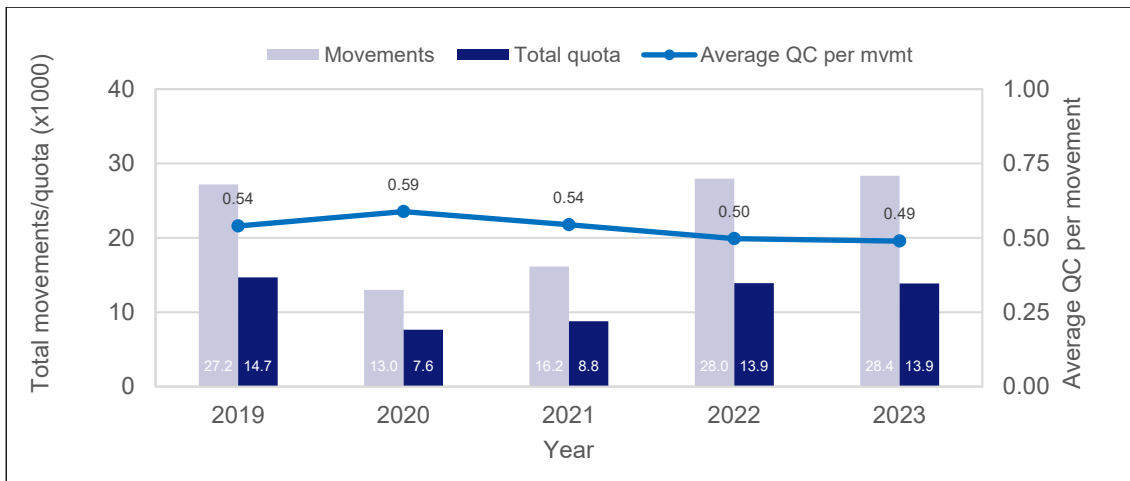
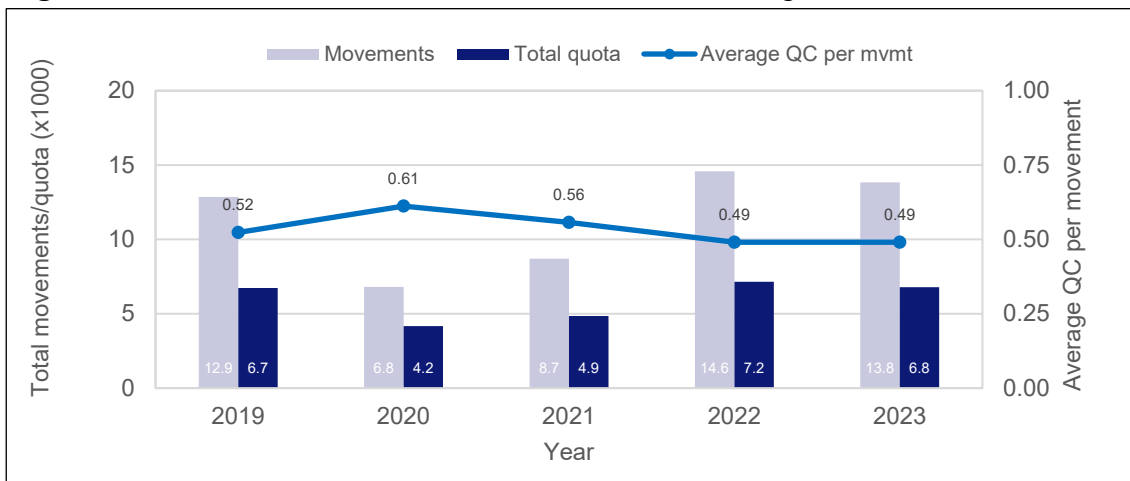


Figure 21 Annual movements at Stansted, 6.5 hour night



Fleet mix

- 5.6 Figures 22, 23 and 24 show the percentages of different aircraft types operating at Stansted between 2019 and 2023 during the 16 hour day, 8 hour night and 6.5 hour night periods, respectively. In each figure, aircraft movements have been grouped into the following broad categories of aircraft based on size and, where applicable, the level of aircraft noise reduction technology:
- Wide-body
 - ‘New Generation’ Wide-body
 - Narrow-body
 - ‘New Generation’ Narrow-body
 - Other
- 5.7 A summary of aircraft types covered by each category is provided in Appendix B. When reviewing the results in Figures 22 to 24, readers should also note the significant reductions in the numbers of movements that occurred during 2020 and 2021 (Figures 19 to 21).
- 5.8 It is evident from the results that narrow-body aircraft in general dominate the fleet at Stansted, typically accounting for around 90 percent of all aircraft movements. Ryanair is the dominant operator at Stansted and operates a fleet of Boeing 737 (narrow-body) aircraft, typically accounting for more than 60 percent of all operations at the airport.
- 5.9 The results show a marked increase in the numbers of New Generation narrow-body aircraft at Stansted since 2021, largely as a result of the entry into service of Ryanair’s new Boeing 737 MAX aircraft¹⁶. This proportion is expected to increase further over the coming years as more older aircraft are replaced with newer, quieter designs.
- 5.10 In total Ryanair has ordered 210 new Boeing 737 MAX 8200 aircraft, 153 of which have been delivered as of May 2024¹⁷. While all 210 aircraft were originally expected to be delivered by December 2024, there is now some uncertainty over the remaining MAX 8200 deliveries¹⁸. In May 2023 Ryanair also placed a firm order for 150 new 737 MAX 10 aircraft (with options for 150 more) for delivery between 2027 and 2033¹⁹.

¹⁶ <https://corporate.ryanair.com/news/ryanair-orders-75-boeing-max-8200-aircraft-210-in-total/>

¹⁷ <https://www.boeing.com/>

¹⁸ <https://corporate.ryanair.com/news/ryanair-boeing-delivery-update/>

¹⁹ <https://corporate.ryanair.com/news/ryanair-orders-300-boeing-737-max-10-aircraft-worth-40bn/>

Figure 22 Aircraft type categories at Stansted, 16 hour day

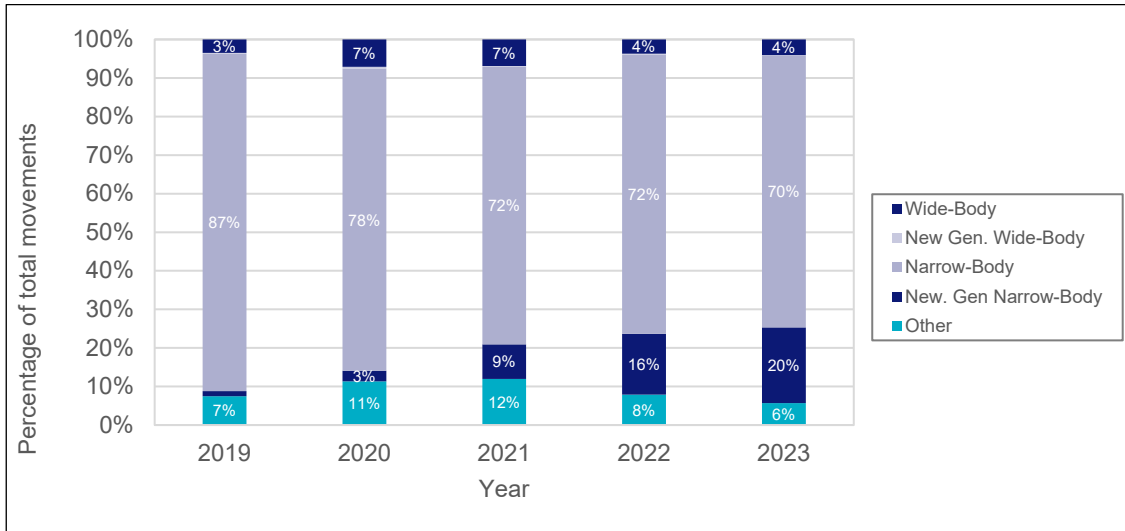


Figure 23 Aircraft type categories at Stansted, 8 hour night

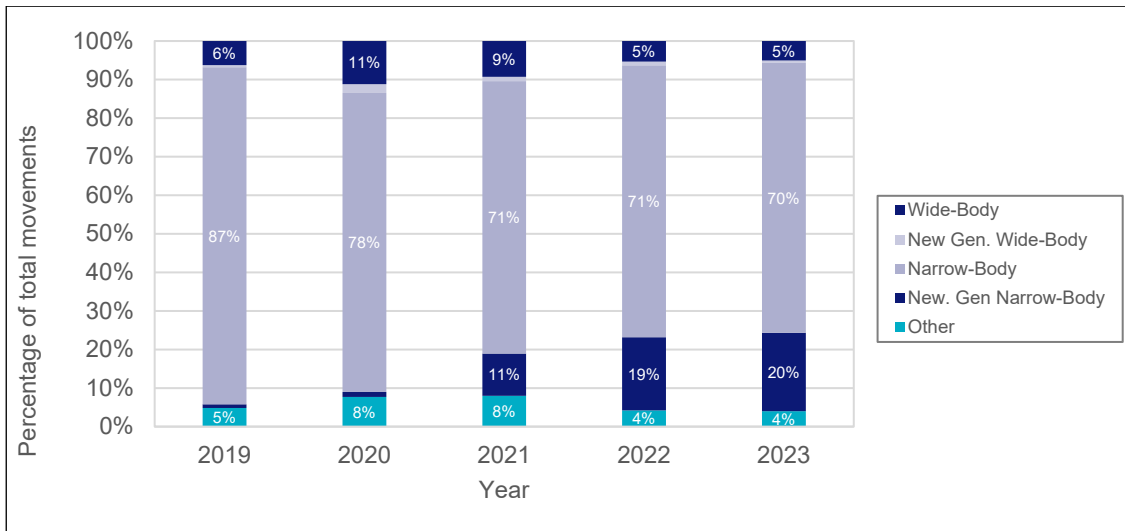
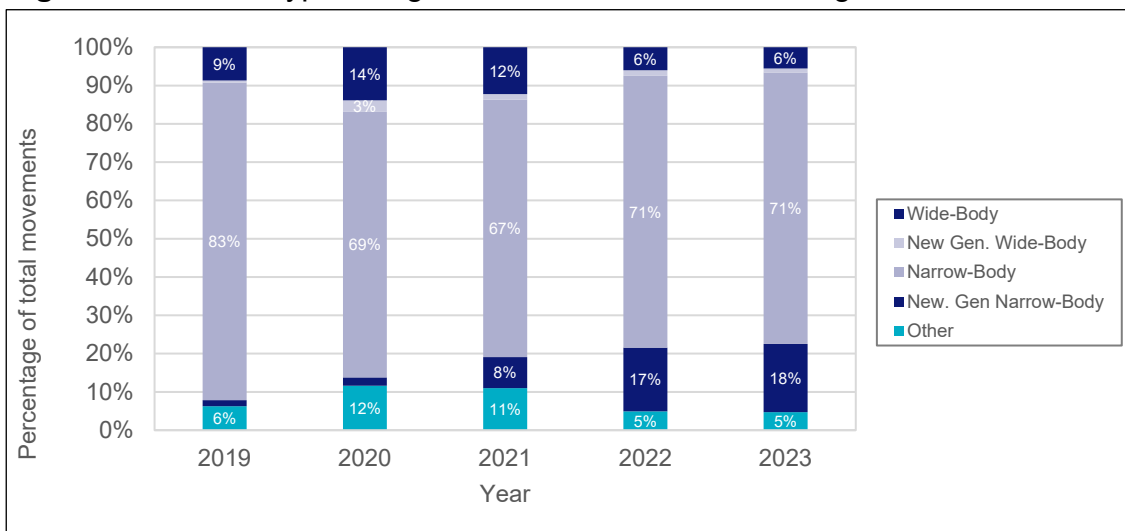


Figure 24 Aircraft type categories at Stansted, 6.5 hour night



Distance flown

- 5.11 To provide insight on the distances flown by aircraft operating from Stansted, Figures 25, 26 and 27 show the percentages of different route categories flown between 2019 and 2023 during the 16 hour day, 8 hour night and 6.5 hour night, respectively. In each figure, aircraft movements have been grouped as follows:
- Short-haul flights under 1,500 km (<810 NM)
 - Medium-haul flights between 1,500 and 3,500 km (810–1,890 NM)
 - Long-haul flights over 3,500 km (>1,890 NM)
- 5.12 The overall trend within each of the time periods at Stansted has been relatively consistent since 2019, with short-haul flights accounting for the majority of movements. However, the results for daytime show that since 2020, there has been a slightly smaller percentage of short-haul flights each year compared to 2019.
- 5.13 The results also show a slightly smaller percentage of short-haul flights (with a slightly greater percentage of medium-haul flights) at night compared to the daytime for each year.

Figure 25 Route categories flown at Stansted, 16 hour day

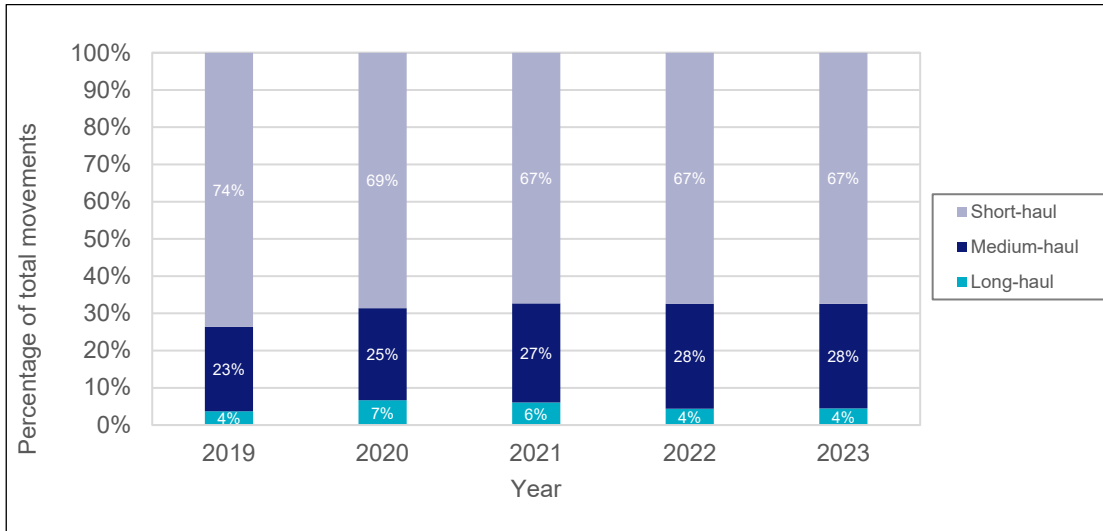


Figure 26 Route categories flown at Stansted, 8 hour night

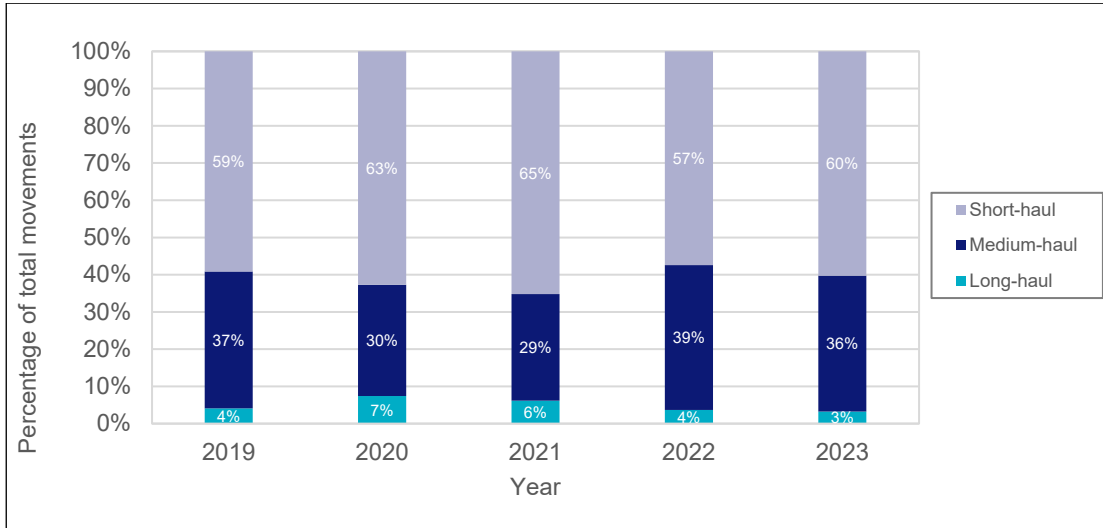
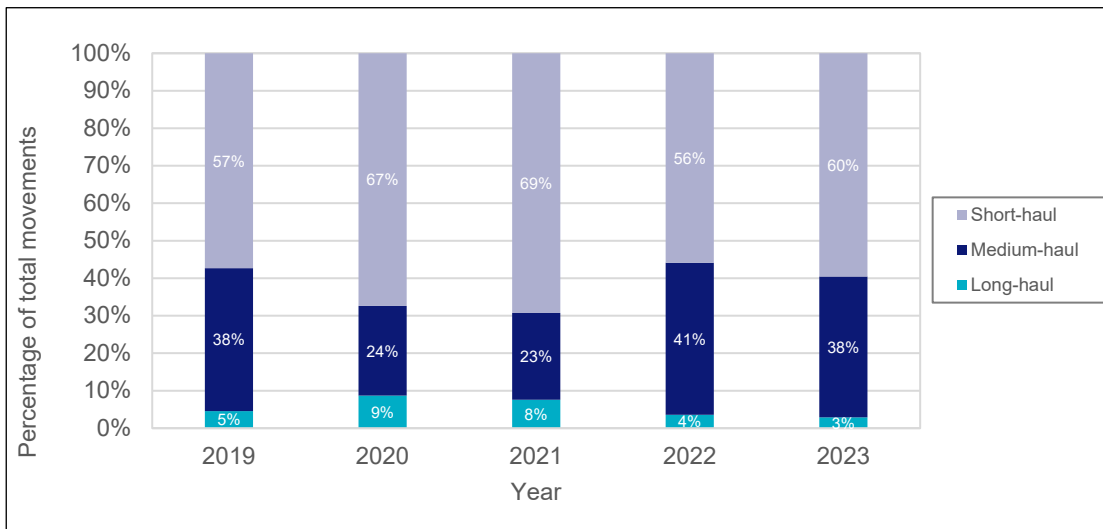


Figure 27 Route categories flown at Stansted, 6.5 hour night



Chapter 6

Summary

- 6.1 This study provides a summary of aircraft movements, fleet mix and noise quota usage at Gatwick, Heathrow and Stansted airports between 2019 and 2023. The results for all three airports show a significant reduction in the numbers of movements and associated quota usage in 2020 and 2021 as a result of the Covid-19 pandemic.
- 6.2 In 2023, daytime movements at Gatwick recovered to 89 percent of pre-pandemic levels. Night-time movements at Gatwick recovered to a greater extent, reaching 98 percent of the pre-pandemic level during the 8 hour night in 2023. During the 6.5 hour night, movements at Gatwick in 2023 exceeded those in 2019 by more that 10 percent.
- 6.3 At Heathrow, daytime movements recovered to approximately 95 percent of pre-pandemic levels in 2023, with movements during the 8 hour night all but returning to pre-pandemic levels. During the 6.5 hour night period, movements at Heathrow in 2023 recovered to approximately 92 percent of the level in 2019.
- 6.4 Daytime movements at Stansted recovered to approximately 97 percent of the level in 2019, with night-time movements slightly exceeding pre-pandemic levels during both 2022 and 2023. During the 6.5 hour night in particular, movements at Stansted in 2022 exceeded those of 2019 by more that 10 percent.
- 6.5 Across all three airports, there was an overall reduction in the average QC per movement between 2019 and 2023, indicating that aircraft fleets are gradually becoming quieter over time.
- 6.6 The results show that with the exception of the night period at Heathrow (which is dominated by wide-body aircraft), narrow-body aircraft in general dominate the fleets at all three airports. The results also show that since 2019, New Generation aircraft have accounted for a greater proportion of the overall fleets. This proportion is expected to increase further over the coming years as airlines continue to replace older aircraft in their fleets with newer designs.

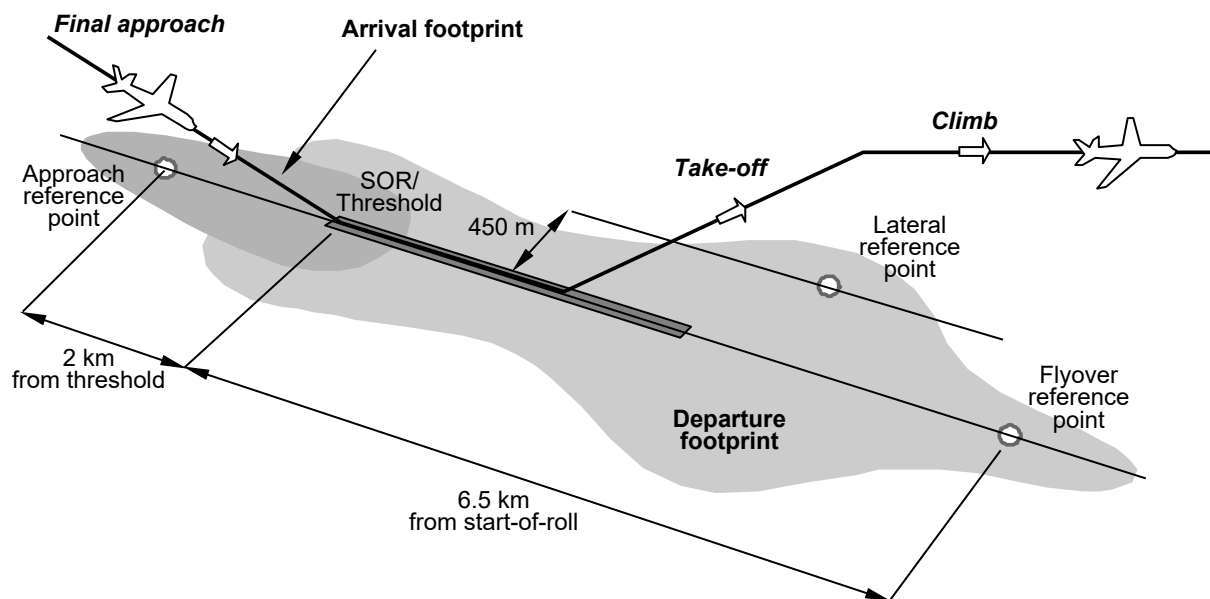
APPENDIX A

The Quota Count (QC) system

- A1. The Night Flying Restrictions at Gatwick, Heathrow and Stansted airports specify a night period (23:00–07:00 hours) during which the noisiest types of aircraft may not be scheduled to land or take off. In addition, between 23:30 and 06:00 hours (the night quota period) aircraft movements are restricted by movement limits and noise quotas that are set by the Department for Transport (DfT) for each summer and winter season.
- A2. The noise quotas are designed to encourage the use of quieter aircraft. Movements at each airport count against the airport's noise quota according to their Quota Count (QC) classifications. The movement limits and noise quotas are set out in a Notice which is published each season in a Supplement to the UK Aeronautical Information Publication²⁰ (AIP), which gives effect to the night restrictions.
- A3. The QC classifications are intended to indicate each aircraft's relative contribution to the total impact of aircraft noise on the airport surroundings. Noisier aircraft types carry a higher QC classification. The classification of aircraft for this purpose is based on their ICAO certificated noise levels and each aircraft type is classified separately for arrival and departure.
- A4. The certification procedure, specified in Chapter 3 of ICAO Annex 16²¹, requires the determination of arrival and departure EPNLs, see Figure A1. Three reference measurement points are specified: *approach*, under a 3-degree descent path 2 km from the runway threshold; *lateral*, 450 m to the side of the initial climb after take-off, at the longitudinal position where noise is greatest; and *flyover*, under the departure climb path, 6.5 km from start-of-roll (SOR).

²⁰ [NATS UK | AIP Supplements \(ead-it.com\)](https://www.ead-it.com)

²¹ Annex 16 – Environmental Protection, Volume I – Aircraft Noise, ICAO, Eighth Edition, July 2017

Figure A1 Aircraft noise reference points (in relation to illustrative noise footprints)

- A5. Classifications for departures are based on the average of the lateral and flyover EPNLs, and for arrivals after subtracting 9 EPNdB from the approach EPNL. Further technical details can be found in ERCD Report 0204²².
- A6. The aircraft QC classifications were, as a matter of policy, based on official certificated noise levels because these are (i) generally considered to be reliable indicators of aircraft noise performance, (ii) available for practically every civil transport aircraft in current operation, (iii) openly published and therefore readily applied by administrators of the scheme, and (iv) correlated with noise footprint areas, which were taken to be appropriate measures of 'noise impact'.
- A7. The central feature of the classification system is that each aircraft is given a QC rating, which increases by a multiple of two in step with the 3-decibel (dB) doubling of noise energy principle (e.g. QC/1, QC/2, QC/4, etc.). The underlying principle of the scheme is to encourage the use of quieter aircraft by making each movement of a noisier type use more of the total available quota set for each airport. All other things being equal, a 50 percent reduction in total noise quota is equivalent to a 3 dB reduction in average noise exposure.

²² [ERCD Report 0204](#), *Review of the Quota Count (QC) System: Re-analysis of the Differences between Arrivals and Departures*, CAA, November 2002

- A8. Under the current scheme, aircraft are assigned Quota Counts based on their certificated noise levels as shown in Table A1.

Table A1 Quota Count classifications

Noise Classification, EPNdB	Quota Count
Below 81	0
81 – 83.9	0.125
84 – 86.9	0.25
87 – 89.9	0.5
90 – 92.9	1
93 – 95.9	2
96 – 98.9	4
99 – 101.9	8
Greater than 101.9	16

APPENDIX B

Aircraft type categories (not exhaustive)

Wide-body

- Airbus A300
- Airbus A310
- Airbus A330
- Airbus A340
- Boeing 747-200/-400
- Boeing 767
- Boeing 777
- MD-11F

New Generation Wide-body

- Airbus A330neo
- Airbus A350
- Airbus A380
- Boeing 747-8
- Boeing 787

Narrow-body

- Airbus A318/A319/A320/A321
- Boeing 737 NG
- Boeing 757
- Embraer ERJ-170/-190

New Generation Narrow-body

- Airbus A220
- Airbus A319neo/A320neo/A321neo
- Boeing 737 MAX
- Embraer E-190 E2/-195 E2

Other (including Business and Regional Jets)

- Business Jets
- BAe 146/Avro RJ
- Embraer ERJ-135/-145
- Small/Large Propeller

APPENDIX C

Glossary

AIP	UK Integrated Aeronautical Information Publication. A manual containing thorough details of regulations, procedures and other information pertinent to flying aircraft in the UK.
Aircraft movement	Any aircraft take-off or landing at an airport. These could be either commercial or non-commercial flights. For airport traffic purposes one arrival and one departure are counted as two movements.
ICAO	International Civil Aviation Organization.
NTK	Noise and Track-Keeping monitoring system. The NTK system associates air traffic control radar data with related data from noise monitors at prescribed positions on the ground.
QC	Quota Count. The basis of the London airports' night flying restrictions regime. Noisier aircraft types carry a higher QC classification. The classifications are based on ICAO certificated noise levels and each aircraft type is classified separately for arrival and departure.