

# Environmental charging – review of impact of noise and NOx landing charges: update 2017

**CAP 1576**



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# Summary

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This review provides an update to our report *Environmental charging – Review of impact of noise and NOx landing charges* (CAP 1119) published in 2013, to highlight to what extent airports have followed CAP 1119 recommendations and used landing charges to incentivise airlines to use quieter aircraft types to improve their noise performance in order to share the benefit of new aircraft technology with local residents.

This report presents noise and emissions related charges in the intervening period since publication of CAP 1119, from 2014/15 to 2017/18.

Information is presented on how differential environmental charges have been applied at the three airports designated for noise management by the Secretary of State (Gatwick, Heathrow and Stansted) by considering their fleet mix with respect to aircraft noise category.

Recommendations are made regarding:

- Disaggregation of noise charging categories
- Earlier signalling of future charging levels
- Night time charging period
- Separation of noise charges for arrivals and departures
- Night period charging levels

## Chapter 1

# Introduction

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- 1.1 In 2013, we reviewed noise-related and NOx emissions-related landing charging schemes for airports designated by the Secretary of State, namely Heathrow, Gatwick and Stansted airports as well as three non-designated airports (Manchester, East Midlands and Birmingham airports) for comparison. Our report *Environmental charging – Review of impact of noise and NOx landing charges* (referred henceforth as CAP 1119<sup>1</sup>) was published in October 2013.
- 1.2 The main finding of CAP 1119 was that differential environmental landing charges were unlikely to be the main financial driver for using quieter and less polluting aircraft although they do offer some incentives to operate quieter aircraft. We suggested that more appropriate charge differentials and earlier introduction of the higher charges for categories of aircraft that exhibit poor noise and NOx performance relative to emerging standards, could reasonably increase the incentive to shift to best-in-class aircraft. As such, we made seven recommendations to airports which we believe may improve the effectiveness of landing charging schemes.
- 1.3 This review provides an update to CAP 1119, to highlight where and where not airports have followed our recommendations:
- a) Noise charging categories should be based on ICAO certification data, namely the margin to Chapter 3, to incentivise best-in-class.
  - b) Noise charging categories should be of equal width, typically 5 EPNdB, or narrower, to ensure adequate differentiation of noise performance.

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<sup>1</sup> Environmental charging – Review of impact of noise and NOx landing charges. CAP 1119.UK Civil Aviation Authority (2013)

- c) The noise charging categories used at a given airport should cover the full range of aircraft in operation at the airport. This range should be reviewed periodically and modified as appropriate.
- d) Noise charges for operations occurring at night should be greater than those that occur during the day.
- e) Where noise-related charge differentials occur depending on the time of day of an operation, the scheduled time of the operation should be used as oppose to the actual time. Penalties may be used to disincentivise operations scheduled to occur on the cusp of the night period that regularly fall into the night period.
- f) There should be a clear distinction between noise-related landing charges and any non-noise-related charges, e.g. demand-related charges.
- g) Charging schemes should ideally be harmonised across airports within the UK. Aircraft should be treated similarly from one airport to another, even if the charges at each airport are different.

1.4 As a first report on landing charges, CAP 1119 presented an historical background to landing charging, and to noise and emissions related charges in particular, in the context of general airport charges, the impact that it had on both airports and operators, the rationale for the charges and the benefits that were expected from noise and emissions related charges. It presented data from 2001 up to and including 2014, with a particular focus on the latest year (2013/14) and the proposed changes that the main airports were consulting at the time.

1.5 This report will present, in Chapter 2, background information on the main aspects of environmental landing charges that we address in this report, including a description of noise categories, and relevant legislation and guidance documents. In Chapter 3, a landing charges review and an analysis of the fleet by noise category at each designated airport with some derived conclusions is presented, in addition to a brief description on how the non-designated airports have addressed landing charges by

comparison. Chapter 4 addresses emission charges, and Chapter 5 presents a review of the current and proposed charging schemes against the recommendations we made in CAP 1119. Finally, Chapter 6 concludes with a summary of the main issues addressed and a set of final recommendations.

- 1.6 As an update report to CAP 1119, this revision is pursuant to the same environmental objectives in relation to DfT's Aviation Policy Framework at the designated airports as well as the environmental objectives of CAA's Five Year Strategic Plan<sup>2</sup>.

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<sup>2</sup> Our CAA Five Year Strategic Plan sets out how we propose to contribute to the development of the UK aviation sector over the five years from 2016–2021, what we want to achieve and how we plan to do it. It is available to view at <https://www.caa.co.uk/Our-work/Corporate-reports/Strategic-Plan/Our-five-year-strategic-plan/>

## Chapter 2

# Legislative drivers and guidance documents: update

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- 2.1 CAP 1119 presented the legislative and guidance background relevant to landing charges. In this chapter, only a brief reminder is given, highlighting where changes have occurred in respect to legislative drivers, guidance documents, noise category definitions and NOx standards.

## Legislative drivers

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- 2.2 The legislative drivers regulating airport charges are, as stated previously in CAP 1119, as follows:

- i. Civil Aviation Act 2006
- ii. Airport Charges Directive (2009/12/EC)
- iii. Airport Charges Regulations 2011
- iv. Balanced Approach Directive (2002/30/EC)
- v. UK Aerodrome Regulations

- 2.3 The only change since the publication of CAP 1119 is that the European Union (EU) Balanced Approach Regulations 2014<sup>3</sup> entered into force on 16 April 2016 repealing the Balanced Approach Directive (2002/30/EC). The Balanced Approach Regulations 2014 aim to facilitate the achievement of specific noise abatement objectives, and to enable the use of operating restrictions to achieve sustainable development of an airport.

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<sup>3</sup> Regulation (EU) 598/2014 of the European Parliament and the Council of 16 April 2014 on the establishment of rules and procedures with regards to the introduction of noise-related operating restrictions at Union airports within a Balanced Approach. European Parliament (2014)

## Guidance documents

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- 2.4 Guidance on noise-related charges, as presented in CAP 1119, was provided by the International Civil Aviation Organization (ICAO), namely:
- i. Policies on charges for airports and air navigation services (ICAO, Doc 9082)
  - ii. Airports Economic Manual (ICAO, Doc 9562)
  - iii. Guidance on the Balanced Approach to Aircraft Noise Management (ICAO, Doc 9829)
- 2.5 No changes occurred since the publication of CAP 1119.

## Previous and current sets of noise categories

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- 2.6 Noise standards for aircraft certification are set by ICAO to ensure that the latest technological advances in the mitigation of aviation noise are transposed into the design and manufacturing of new aircraft. The ICAO noise standards are set out in ICAO Annex 16 to the Convention on Civil Aviation, Environmental Protection, Volume 1: Aircraft Noise.
- 2.7 Noise certification involves the measurement of noise levels during the take-off and landing phases of operation in a specific and controlled manner. Three measurements are taken: flyover and sideline (lateral) during take-off, and approach during landing. For each measurement point, the measured level is then compared with the maximum allowed level (limit) as specified in ICAO Annex 16. The difference between each measurement and the maximum allowed level constitutes the noise margin for a given airframe/engine configuration at the certificated take-off and landing masses<sup>4</sup>. The sum of the noise margin at each of the measurement points is the cumulative margin.

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<sup>4</sup> The term mass is used here as the ICAO Annex 16 regulations are related to the aeroplane mass measured in kilograms. Although commonly referred to as the aeroplane weight (including in some airports' Conditions of Use documentation), technically speaking, weight is the force on an object due to gravity.

- 2.8 The Chapter 2 standard was the first noise standard for subsonic jet aircraft in 1972. The Chapter 3 standard became applicable in 1977 and introduced new noise limits at each of the three measurement points such that the Chapter 3 limit has a cumulative margin of at least 16 dB lower than Chapter 2. The Chapter 4 standard, introduced in 2006, retained the Chapter 3 limits at each measurement point, but requires that a) the limit at any single point is not exceeded, b) the minimum margin at any two points is at least 2 EPNdB, and c) that the cumulative margin is at least 10 EPNdB (effective perceived noise level in decibels) relative to Chapter 3. The latest standard, Chapter 14, agreed in 2013, retains the Chapter 3 limits, but requires at least 1 EPNdB margin at each measurement point and a cumulative margin of at least 17 EPNdB below than the Chapter 3 limit.
- 2.9 For charging purposes, further subdivisions are made by certain airports based on the ranges of ICAO Annex 16 noise standards to achieve a greater level of refinement in the noise categorisation of aircraft types, such as those set by the Airports Council International (ACI) allocating an Aircraft Noise Rating Index to each aircraft depending on its cumulative margin. For example, the ACI indices are stepped in 5 EPNdB bands. However, rather than use the ACI rating, airports have traditionally assigned each category a name that relates to the cumulative noise margin or to the noise standard to which it is certified<sup>5</sup>, i.e. Chapter 3 Base, Chapter 4 High and so on.
- 2.10 The previous and current sets of noise categories used by airports in the UK are illustrated in Figure 1, where it can be seen that Chapter 3 is subdivided into two subcategories, Chapter 3 High (between 0 and -5 EPNdB cumulative margin relative to Chapter 3 limit) and Chapter 3 Base (between -5 and -10 EPNdB cumulative margin). Currently,

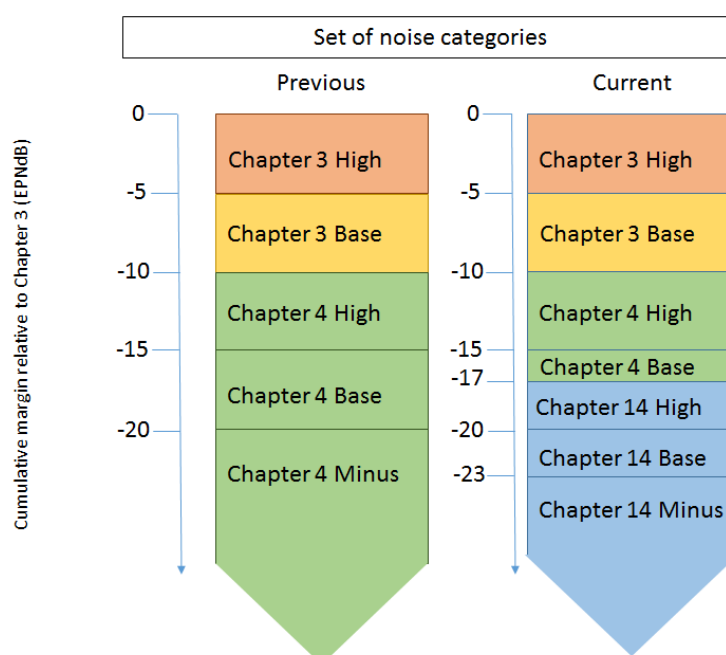
<sup>5</sup> At some airports, aircraft do not need to be officially certified to the relevant ICAO Chapter to be eligible for the corresponding noise charge. Instead airlines at some airports are only required to demonstrate the potential to comply with the noise category claimed. For example, an aircraft certified to the Chapter 4 noise standard that has a cumulative noise margin in excess of 17 EPNdB would qualify for the Chapter 14 noise charge.

Chapter 4 is subdivided into Chapter 4 High (-10 to -15 EPNdB), Chapter 4 Base (-15 to -20 EPNdB) and Chapter 4 Minus (< -20 EPNdB).

2.11 With the introduction of Chapter 14, some airports have proposed revised noise categories, where the previous lowest category (Chapter 4 Minus) is replaced by a suite of Chapter 14 subcategories, namely Chapter 14 High (-17 to -20 EPNdB), Chapter 14 Base (-20 to -23 EPNdB) and Chapter 14 Minus (< -23 EPNdB). The previous range of Chapter 4 Base, between -15 and -20 EPNdB, is narrowed to between -15 and -17 EPNdB in the current set of noise categories. Departing from the allocation of noise categories based on steps of 5 EPNdB, the new subdivisions of the new Chapter 14 standard are differentiated in steps of 3 EPNdB, leaving the Chapter 4 Base category with a width of 2 EPNdB.

2.12 The Chapter 14 standard will come into effect in 2018 (from 31st December 2017 for aircraft with a MTOW of more than 55 tonnes, and 31st December 2020 for aircraft with a MTOW of less than 55 tonnes), and is therefore not applicable at present. However, the current set of noise categories, used by the UK designated airports, is used in this report to illustrate the incentives that are being built into the charging schemes by the airports for airlines to operate quieter fleets.

**Figure 1: Previous and current sets of noise categories**



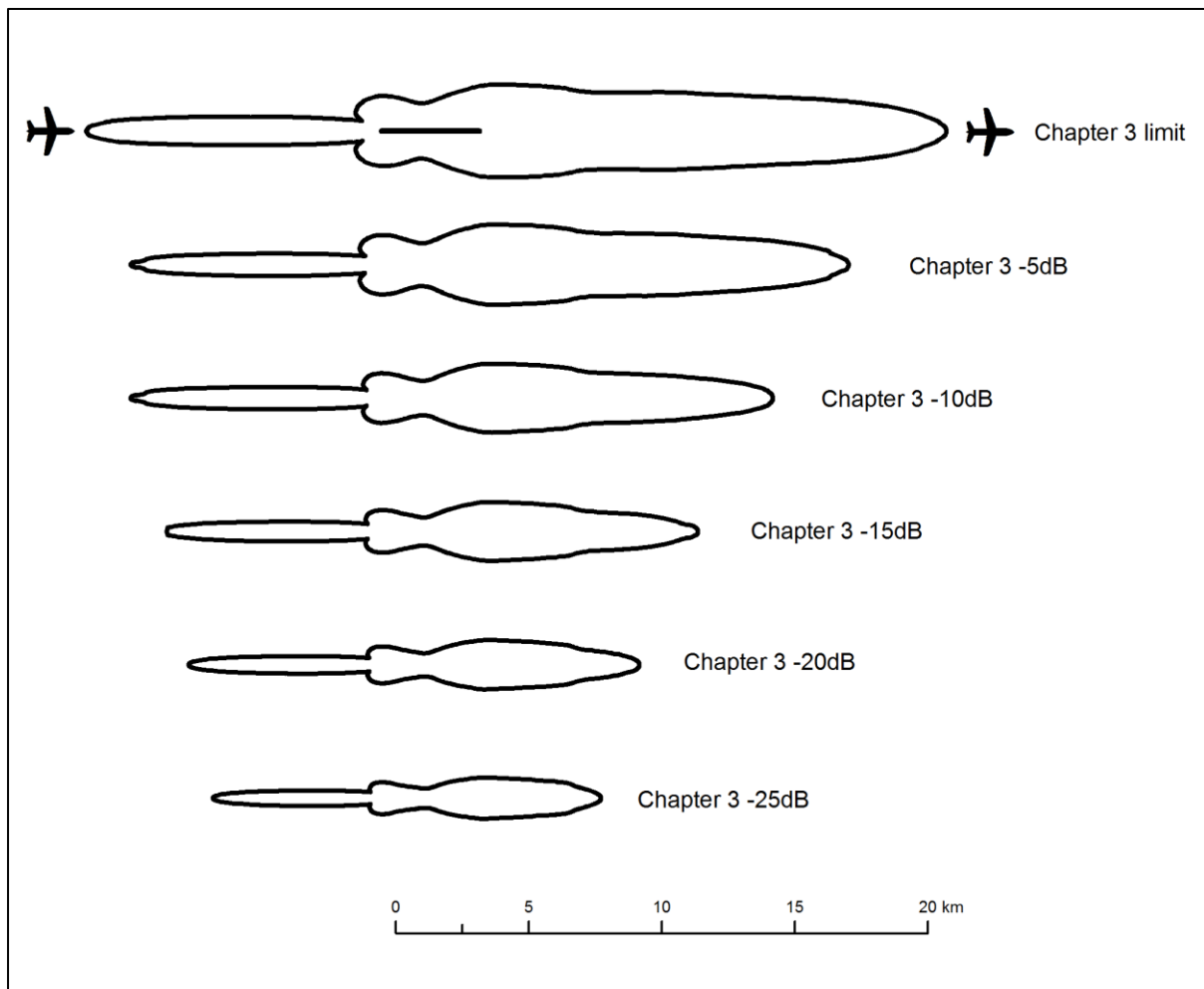
- 2.13 Aligning the categories with the Chapter 14 limit results in categories that are narrower than 5 EPNdB and no longer of equal width across the range of categories. In responding to local community concern, airports have established noise categories, such that they incentivise the adoption of progressively quieter aircraft. This can be achieved by relating the noise categories to cumulative margin alone. Secondly, having adopted noise categories directly linked to noise performance at certification, progress may be monitored and tracked over time.

## Footprints by noise category

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- 2.14 In order to appreciate the noise benefits associated with quieter noise categories, Figure 2 illustrates the differences in combined arrival and departure noise footprint area given by the 80 dB SEL footprint of a 150-179 passenger twin engine aircraft (A320/B737-800 equivalent) with different cumulative margins (given in steps of 5 dB). For illustration purposes, an A320 built in 2000 with CFM56-5B4/2 engines has a cumulative margin of -12.6 dB relative to Chapter 3 limits which put it in the Chapter 4 High category. The footprint of this aircraft would correspond to somewhere between the third and the fourth footprint from the top. In contrast, an A320 built in 2014 with V2527-A5 engines, with cumulative margin of -20.7 dB, is Chapter 14 Base and its footprint is similar to the second footprint from the bottom in Figure 2.

**Figure 2: SEL 80 dB arrival and departure footprint by noise margin of a 75 tonne twin engine aircraft**



- 2.15 The footprints of 4-engine aircraft are larger than 2-engine aircraft, due to their poorer climb performance on departure. However, the proportional differences between the footprints of a 4-engine aircraft are equivalent to the proportional difference of the footprints of the 2-engine aircraft.

## Noise quota system

- 2.16 It is widely acknowledged that noise from night-time aircraft operations can cause a greater adverse effect in humans than noise from daytime operations. As such, some noise charging schemes aim at disincentivising night operations. In addition to noise charging schemes, which can vary between day and night, airports may also apply restrictions on the overall numbers (or types) of movements during the night period. Night flying

restrictions at the designated London airports are set by the Department for Transport, using the Quota Count (QC) system.

- 2.17 The QC is a numeric classification assigned to a specific aircraft (airframe/engine) configuration, calculated from its ICAO noise certification data. It applies to arrival and departure movements separately i.e. a specific aircraft may have a different Quota Count for take-off and for landing.
- 2.18 The noise levels in the Quota system are classified into bands of 3 EPNdB corresponding to a doubling of noise energy, i.e. an aircraft classified QC0.25 emits half the noise energy than an aircraft classified QC0.5, and so on. The current noise level classifications and corresponding Quota Counts are presented in Table 1.

**Table 1: Quota count classifications**

| Noise classification (EPNdB) <sup>6</sup> | Quota count |
|-------------------------------------------|-------------|
| More than 101.9                           | 16          |
| 99 – 101.9                                | 8           |
| 96 – 98.9                                 | 4           |
| 93 – 95.9                                 | 2           |
| 90 – 92.9                                 | 1           |
| 87 – 89.9                                 | 0.5         |
| 84 – 86.9                                 | 0.25        |
| Less than 84                              | 0 (Exempt)  |

- 2.19 The QC system is widely used at airports in the UK for banning, restricting or disincentivising movements of aircraft in certain periods of the day.
- 2.20 The QC system is of particular importance at the three designated airports during most of the night period. The night period covers from 23.00 to 07.00, while the night quota period covers from 23.30 to 06.00. During the night period QC8 and QC16 aircraft are banned from operating. During the night quota period, QC4 aircraft operations cannot be scheduled.

<sup>6</sup> Effective Perceived Noise Decibels, a specialised noise unit used for aircraft noise certification tests. Figures based on average of flyover and sideline for departures, and after 9 EPNdB subtraction from approach value.

- 2.21 Further limits are placed on the night quota period at the designated airports. Since 1993 the Government has imposed restrictions on the number of movements and the amount of noise energy emitted (expressed as the sum of the quota counts of all aircraft operating during any one season) during the night quota period at Heathrow, Gatwick and Stansted. The limits of movements and quota are placed for summer and winter seasons separately. The restriction applies to whichever criterion is reached first. In other words, the movement limit cannot be surpassed even if the quota has not been exhausted, and vice versa. The movement and quota limits are revised periodically by the Government.
- 2.22 Airports are also given flexibility to carry-over unused movements or quota from one season to another, or may over-run the movement or quota limit in one season leading to a deduction in the next. Full details of the scheme are set out in a statutory Notice which is published for each summer and winter season in a Supplement to the UK Aeronautical Information Publication (UK AIP)<sup>7</sup>.

## CAEP NOx standards

- 2.23 As stated in CAP 1119, ICAO standards exist 'to ensure, in the most part, comprehensive uptake of the new technology by certain dates'. The adoption and entry years as well as the NOx limit of each standard are presented in Table 2.

**Table 2: CAEP NOx standards**

| NOx standard | Adoption year | Entry year | Limit (grNOx/kn) |
|--------------|---------------|------------|------------------|
| CAEP/1       | 1981          | 1986       | 100              |
| CAEP/2       | 1993          | 2000       | 80               |
| CAEP/4       | 1999          | 2004       | 67               |
| CAEP/6       | 2004          | 2008       | 59               |
| CAEP/8       | 2010          | 2014       | 50               |

<sup>7</sup> <http://www.nats-uk.ead-it.com/>

- 2.24 The limit is given in grams of NO<sub>x</sub> per kilo Newton<sup>8</sup> of thrust per engine and is based on the NO<sub>x</sub> emitted during a standardised landing and take-off (LTO) cycle with defined thrust settings and times in mode for landing, taxi-in, taxi-out, take-off and climb respectively.
- 2.25 Unlike for airport noise charges, airport NO<sub>x</sub> charges are not directly related to NO<sub>x</sub> standards, however they are based on the standardised ICAO LTO cycle used to calculate NO<sub>x</sub> emissions, and are applied proportionately using a charge per kilogramme of NO<sub>x</sub> emitted during the ICAO LTO cycle. No changes have occurred in relation to NO<sub>x</sub> standards since the publication of CAP 1119.

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<sup>8</sup> A Newton is the force required to accelerate one kilogram of mass at a rate of 1m/s<sup>2</sup>. A kilo-Newton (kN) is 1,000 Newtons.

## Chapter 3

## Noise-related charges

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- 3.1 As mentioned in CAP 1119, environmental charges are unlikely to be the decisive factor upon which airport users (airlines) base their fleet replacement decisions. Under the current charging schemes that we have reviewed, it is difficult to ascertain the true measure of the influence that differential landing charges have in incentivising airlines to shift to quieter aircraft. CAP 1119 exemplified that environmental landing charges make up a small percentage of the total charges met by airlines (typically less than 5%).
- 3.2 We stated in CAP 1119 that, in order to increase the influence of environmental landing charges in encouraging a shift to quieter aircraft, differentials between noise categories should be increased. However, there is a concern that high environmental landing charges could become an operating restriction if operators are not given enough time to adapt to a new scheme. There are two ways in which an airline can react to a new set of differential charges, namely:
- Purchasing newer and quieter aircraft;
  - Bringing quieter aircraft from other routes/airports where noise charges are not so stringent.
- 3.3 Whilst landing charges are unlikely to trigger the purchase of an aircraft, it is expected that operators will have a fleet renewal strategy. Landing charges are more likely to influence decisions to assign the quietest aircraft of an operator's fleet into the airport with the most stringent noise policy. Because airlines will have different levels of scope to assign quieter aircraft to a given airport, environmental charges may have different impacts on individual airlines – some may be able to offset or absorb higher charges on a noisier aircraft type against those of a quieter one, whereas those operating a single fleet type will clearly have limited scope to adapt their operations.

- 3.4 With these notions in mind, this chapter presents an overview of noise and emissions landing charges in the intervening period since publication of CAP 1119 for each study airport. The main changes in the structure of charges, if any, and the current relativity of charges are also addressed. In addition, the aircraft fleet at each designated airport has been analysed for each of the noise categories set out in Chapter 2, in order to determine the progress made in incentivising the use of quieter aircraft.
- 3.5 Heathrow Airport Limited (HAL) and Gatwick Airport Limited (GAL) carried out consultations on their schemes of charges (implemented in 2017), which are also addressed in this report.
- 3.6 We give recommendations at the end of each airport section (if applicable) where changes are checked in relation to CAP 1119 recommendations. In addition, Chapter 5 presents a review of the previous and current schemes against CAP 1119 recommendations.

## Details of charging schemes

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- 3.7 Details of the charging schemes in use at the study airports are presented in this section. In addition, a summary of the main aspects of the charging schemes is given below (Table 3). The changes, relative to the charges given in CAP 1119, are shaded. The charging schemes of the non-designated airports chosen for comparison have not changed significantly, and therefore the main focus has shifted to the designated airports in this update report.

Table 3: Summary of charging systems at the study airports

|                                                  |                             | Heathrow                | Gatwick                                  | Stansted                     | Manchester                                                                           | East Midlands                                            | Birmingham                                                                                        |
|--------------------------------------------------|-----------------------------|-------------------------|------------------------------------------|------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Runway charge                                    | Type                        | Landing                 | Landing and Departure                    | Landing                      | Departure                                                                            | Departure (landing and departure separately for freight) | Departure (landing and departure separately for freight aircraft >30T))                           |
|                                                  | Aircraft Weight parameter   | MTOW (stepped)          | MTOW (stepped)                           | MTOW (stepped)               | 'Maximum Take Off Weight Authorised' (semi-continuous, rate changes at 25t and 120t) | MTOW<br>(> 5.8t continuous)                              | MTOW (continuous for passenger aircraft, semi-continuous for cargo aircraft, rate changes at 30t) |
|                                                  | Noise category parameter(s) | ICAO/ACI noise category | ICAO/ACI noise category                  | ICAO/ACI noise category & QC | ICAO/ACI noise category & QC                                                         | QC                                                       | n/a                                                                                               |
|                                                  |                             |                         |                                          |                              |                                                                                      |                                                          |                                                                                                   |
| Relative Charges re. Chapter 3 base              | Ch2                         | n/a                     | n/a                                      | 300%                         | 170%                                                                                 | n/a                                                      | n/a                                                                                               |
|                                                  | Ch3 high                    |                         |                                          | 150%                         | 100%                                                                                 | n/a                                                      | n/a                                                                                               |
|                                                  | Ch3 base                    |                         |                                          | 100%                         | 100%                                                                                 | n/a                                                      | n/a                                                                                               |
|                                                  | Ch3 minus                   |                         |                                          | 90%                          | n/a                                                                                  | n/a                                                      | n/a                                                                                               |
|                                                  | Ch4                         |                         |                                          | 90%                          | 100%                                                                                 | n/a                                                      | n/a                                                                                               |
| Relative Charges re. Chapter 4 base              | Ch3 & below                 | 389%                    | 200%                                     | n/a                          | n/a                                                                                  | n/a                                                      | n/a                                                                                               |
|                                                  | Ch4 high                    | 111%                    | 100%                                     |                              |                                                                                      |                                                          |                                                                                                   |
|                                                  | Ch4 base                    | 100%                    |                                          |                              |                                                                                      |                                                          |                                                                                                   |
|                                                  | Ch14 high                   | 78%                     | 60%                                      |                              |                                                                                      |                                                          |                                                                                                   |
|                                                  | Ch14 base                   | 56%                     | 50%                                      |                              |                                                                                      |                                                          |                                                                                                   |
|                                                  | Ch14 minus                  | 33%                     | 40%                                      |                              |                                                                                      |                                                          |                                                                                                   |
| Night period (where relevant to landing charges) | Night period, local time    | 01:00-04:30             | 23:30-05:59 local time (1 Apr to 31 Oct) | n/a                          | n/a                                                                                  | 23:30-06:00                                              | 23:30-06:00                                                                                       |
|                                                  | Night surcharge             | 2.5 times day charge    | 12.6 times summer day charge*            | 0%                           | 0%                                                                                   | 25% (if $\geq$ QC/4)                                     | 0%                                                                                                |

|          |                                                         | Heathrow | Gatwick                                                                            | Stansted            | Manchester                                                                        | East Midlands                                         | Birmingham |
|----------|---------------------------------------------------------|----------|------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------|------------|
|          | Night surcharge, Freight (if different to passenger)    | n/a      | n/a                                                                                | n/a                 | n/a                                                                               | Shoulder periods (06:00-07:00 & 21:00-23:30): 302%    | 300%       |
|          |                                                         |          |                                                                                    |                     |                                                                                   | Night period (23:30-06:00): 405-474% depending on QC. |            |
| Off-peak | Off-peak criteria, local time                           | n/a      | Winter all day, and Summer 19:00-23:00 for Arrivals and 19:00-22:30 for Departures | Winter all day only | Reduced winter rates. Combinations of QC values and time periods from 05:30-23:00 | n/a                                                   | n/a        |
|          | Off-peak reduction                                      | n/a      | 67% summer, 100% winter                                                            | 74%                 | 19% (MTOW>25t)                                                                    | n/a                                                   | n/a        |
|          | Off-peak reduction, Freight (if different to passenger) | n/a      | n/a                                                                                | n/a                 | 48%                                                                               | n/a                                                   | n/a        |

\* The night charge is the same in winter and summer. However, the summer day charge is referenced here as there is no winter day charge.

## Heathrow Airport

### Determination of noise category of aircraft

- 3.8 The methodology used by Heathrow Airport to determine the noise category of an aircraft is based solely on the cumulative margin, relative to Chapter 3 and adhering to the ranges given in Figure 1. The previous scheme of charges included all noise categories available when using a 5 EPNdB category width i.e. two categories within Chapter 3, and three categories in Chapter 4. In the current scheme, the categories are amended to align with the new Chapter 14 standard in the framework of charges. The new category, as shown in Figure 3, is divided into three new subcategories separated in 3 EPNdB steps. This is clear and transparent and broadly in line with CAP 1119 recommendations; however, the categories are narrower than 5 EPNdB and no longer of equal width across the range of categories.

### Landing charges overview 2001 to 2018

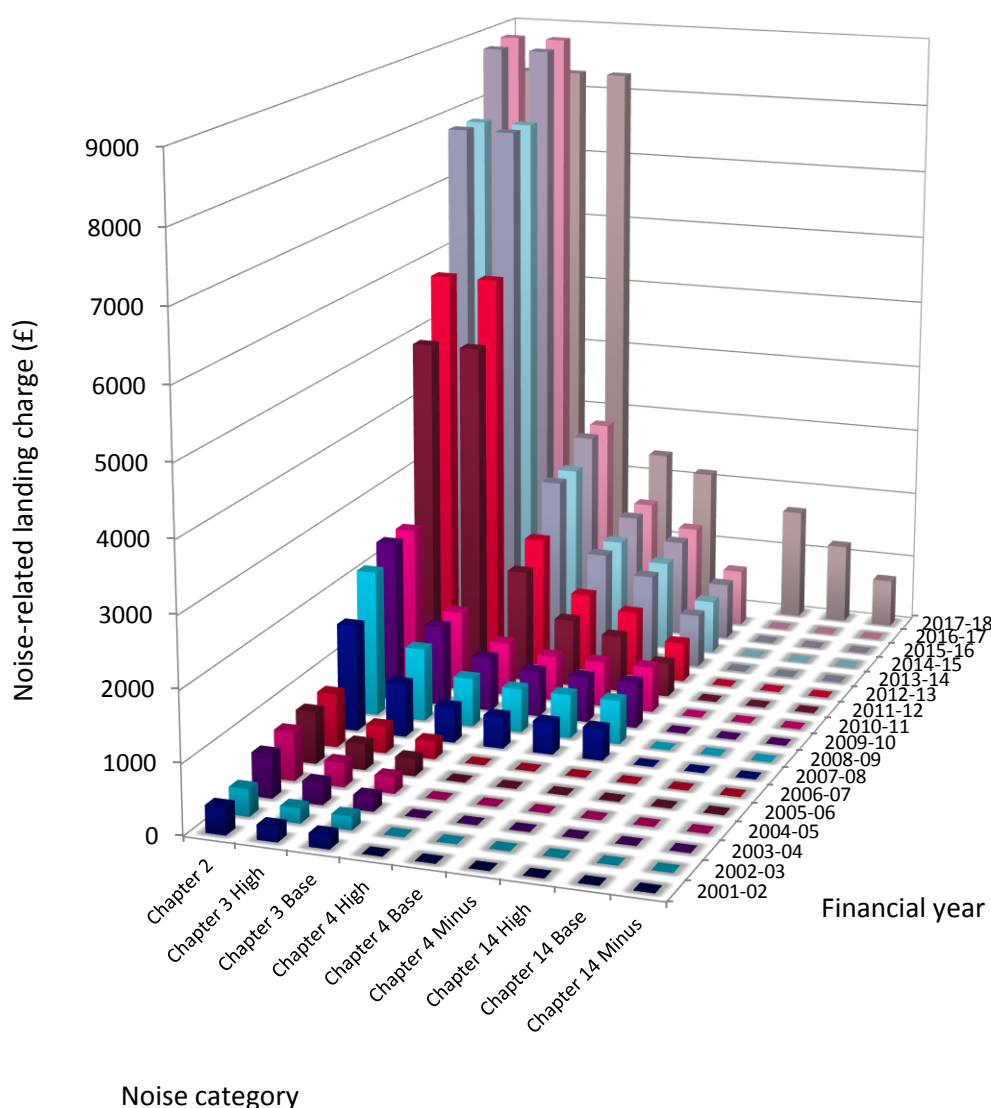
- 3.9 This section looks at the past and present framework of landing charges at Heathrow Airport. A summary of the charging system at Heathrow is presented in Table 3.
- 3.10 The most significant change in the framework of landing charges at Heathrow Airport since the publication of CAP 1119, has been the decision by Heathrow Airport to increase, from 2017, the percentage of revenue from environmental charges which currently stands at 21% of total airport charges, to 28% of total airport charges<sup>9</sup>. Due to the capping of airport charges<sup>10</sup> at the designated airports, the increase in environmental charges is offset by a reduction in per-passenger charges, which fall from 75% to 68% of airport charges.

<sup>9</sup> Heathrow Airport, Airport Charges Structural Review, Decision document, Aug 2015

<sup>10</sup> The CAA has powers under the Civil Aviation Act 2012 for the economic regulation of Gatwick and Heathrow airports.

3.11 CAP 1119 presented an historical overview of noise-related charges applied to Heathrow Airport landing operations starting in the year 2001/02 and ending in 2013/14. Maintaining the historical trend, Figure 3 shows noise related charges from the period 2001-2014 as well as those in the subsequent years up to the present and including changes for the year 2017/18, which includes the new ICAO Chapter 14 standard as the basis for the lowest charge categories.

**Figure 3: Noise-related landing charge (£) per noise category**



3.12 Following the CAP 1119 review, landing charges for the noisiest categories, Chapter 2 and Chapter 3 High, experienced another steep change in the year 2015/16. Landing charges for Chapter 3 Base aircraft