

# Annex C: The current situation at the designated airports

## Preamble

The information and data set out in this Annex was compiled before the COVID-19 pandemic began. We consider that this information represents the most appropriate base case scenario for a future regime to be benchmarked against.

## Our performance against our 2017 - 2022 noise objective to date

Our noise objective for the 2017 – 2022 regime and the considerations we stated we would measure progress against, is set out in Annex B.

Progress against the objective of reducing the area and number of people in the 48dB LAeq 6.5-hour night contour at Heathrow, Gatwick and Stansted Airport has been mixed. Significant progress has been observed with respect to Gatwick and Heathrow where both area and population within the 48dB LAeq 6.5-hour night contour have decreased to the order of almost ten percent over the period from October 2015 to October 2019. On the contrary, increases have been observed in the area and population in the 48dB LAeq 6.5-hour night contour at Stansted Airport. The causes behind the increase in noise at Stansted are varied, but the government believes there is the opportunity to address this before the end of the current regime.

Despite the fact that these results indicate significant progress at two of three airports of interest, it is equally important to acknowledge that there are still two years remaining of the current night flight regime and further evaluation of the regime will take place and be set out as part of the second stage consultation on the night flights regime in 2022.

Progress against our objective to reduce the incidence of noise disturbance associated with night flights at Heathrow, Gatwick and Stansted has been equally mixed. The total number of people highly sleep disturbed<sup>1</sup> during the 6.5-hour night (above 48dB LAeq) across the three airports between 2015-16 and 2018-19 is estimated to have significantly fallen<sup>2</sup>, however the vast majority of this reduction is attributed to large reductions in sleep disturbance at Heathrow. Conversely, incidence of sleep disturbance at Gatwick Airport remains broadly unchanged, while relatively significant increases were observed at Stansted Airport (albeit smaller in magnitude, relative to Heathrow). These sleep disturbance results are likely to be intrinsically related to the changes in area and

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<sup>1</sup> The meaning of 'highly sleep disturbed' is sourced from World Health Organization Burden of Disease from Environmental Noise (2011), and is a self-reported indication of disturbance based on epidemiological studies using survey questionnaires.

<sup>2</sup> In this instance, WebTAG has not been used to formally appraise and monetize sleep disturbance impacts due to a lack of population and area data granularity. Estimating and monetising the marginal sleep disturbance impact at each interest airport requires population data for incremental noise contours from 48dB LAeq upwards, which we have not been able to access. Further detail on the methodology used to estimate sleep disturbance can be found later in this section.

population in the 48dB LAeq 6.5-hour night contour described above. For example, a percentage increase in the population residing within a noise contour is likely to result in a proportionate increase in the number of people reporting sleep disturbance.

Additional night flight statistics for the designated airports, including average QC figures, are contained within the tables presented in Annex D.

## Heathrow

Heathrow is the busiest airport in the UK, serving 80.1 million passengers per year and 189 weekly destinations worldwide<sup>3</sup>. It also carried 1.7 million tonnes of freight in 2018. The airport has two runways, four operational passenger terminals and two cargo terminals. The airport is located approximately 13 miles (21km) west of the centre of London. It is surrounded by: suburban housing, business premises and mixed use open land to the north and south; suburban housing and business premises to the east; and three large reservoirs, mixed use open land, housing and business premises to the west. Under Terminal 5 planning conditions, the number of air transport movements at the airport shall be limited to 480,000 each year.

### Existing night flight operations

Restrictions on night flights have been in place at Heathrow since 1962. Heathrow is currently limited to 5,800 night flights a year - 3,250 in the summer season and 2,550 in the winter season. This equates to approximately 16 flights per night on average.

In addition to the movement limits imposed by the government, Heathrow also has a voluntary agreement in place that sees no flights scheduled between 23:30 and 04:30. It also prevents flights scheduled between 04:30 and 06:00 from landing before 04:30. Alongside this, Heathrow's voluntary Quiet Night Charter aims to reduce by 50% the number of flights that operate after 23:30 on non-disrupted days by 2022.<sup>4</sup>

All scheduled night movements are therefore early morning arrivals between 04:30 and 06:00, mostly from destinations in the Far East. These scheduled early morning arrivals made up about 86% of all the night flights that took place in 2018, with unscheduled late running flights after 23:30 constituting the remainder.

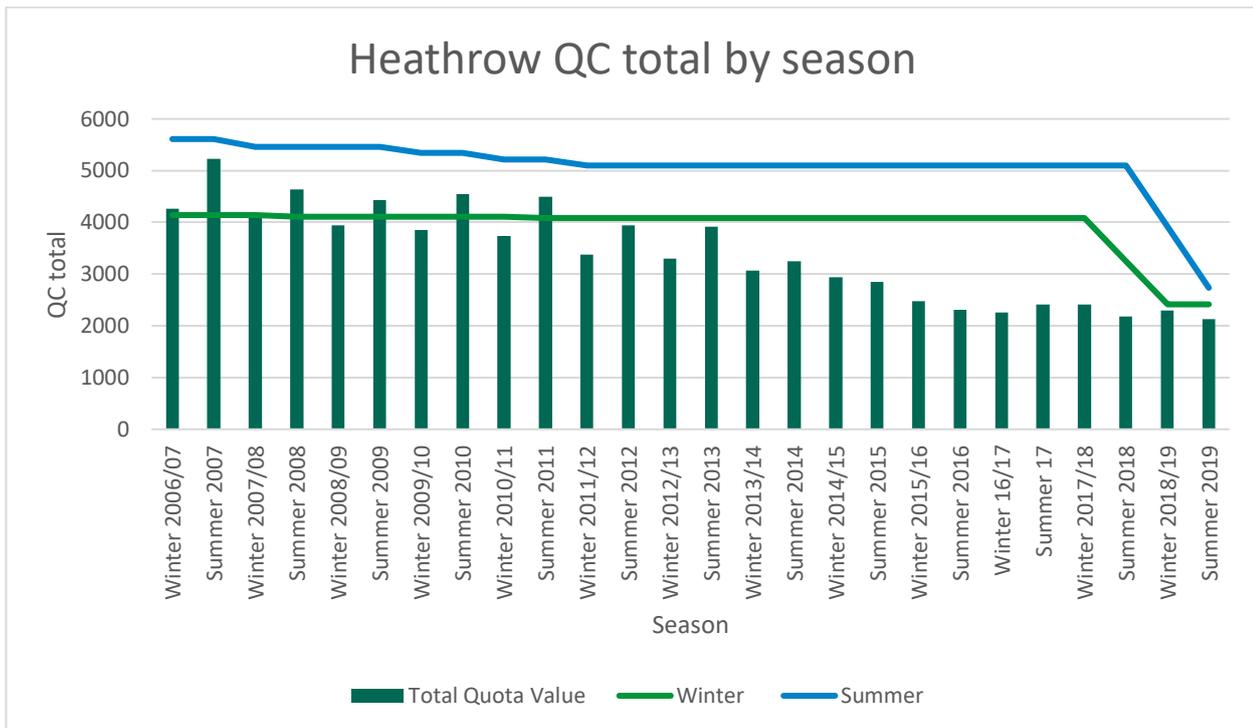
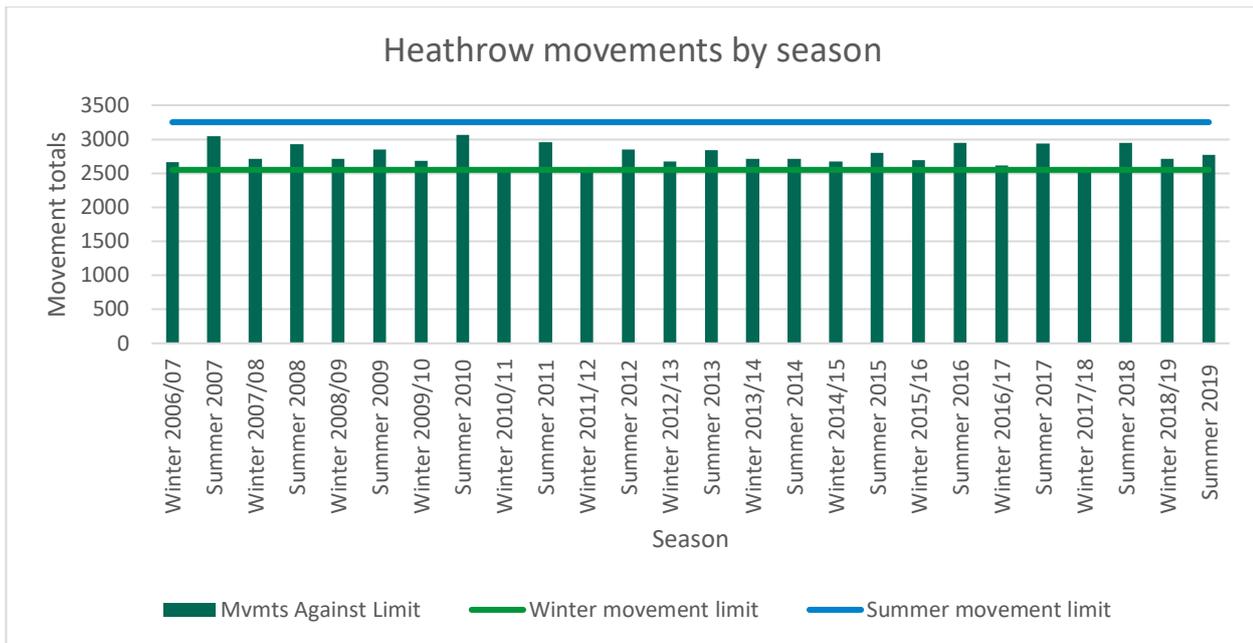
Movements at Heathrow have remained stable for many years. Between winter 2008/09 to summer 2019, Heathrow has used on average 89% of its summer movement limit and 104% of its winter allowance. In summers, the airport carried over the unused quota, as permitted under the current regime.

The difference between summer and winter movements over this timeframe has continued to be small, with an average of 2,879 movements in the summer season and 2,655 movements in the winter season. While Heathrow is using close to its full allowance of movements, recent years have seen a significant reduction in the amount of noise quota usage as a result of the introduction of quieter aircraft. From October 2018, the government lowered Heathrow's QC limit, and the airport has consistently remained within this new limit. In Summer 2019, Heathrow used 85% of its movement limit, and 78% of its QC limit.

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<sup>3</sup> The definition of a weekly destination is a destination with at least 51 departing flights from a UK airport.

<sup>4</sup> 50% from 2016.



#### Impacts of aircraft noise at night

As of October 2019, the current night flights regime has seen a reduction in both the area and population residing within the 48dB LAeq 6.5-hour night contour around London Heathrow, relative to the previous regime (as measured in 2015-16).

Over the three-year period to October 2019, a 9% reduction has been observed in both area and population within the 48dB LAeq 6.5-hour night contour. This is equivalent to a reduction of 3.0 square kilometres and approximately 9,800 people residing within the contour respectively.

The rate of change observed in area and population within the 48dB LAeq 6.5-hour night contour around London Heathrow between 2015-16 and 2018-19 represents a relative slowdown relative to the previous four-year period where area and population within the contour fell by 20%.<sup>5</sup> Also included below are LAeq 8hr night contour results for 2018-19 to compare with previous years at Heathrow.

Between 2015-16 and 2018-19, it is estimated that the number of people ‘highly sleep disturbed’ during the 6.5-hour night (above 48dB LAeq) around London Heathrow fell by 800 (approximately 9 percent), to 8,000 people<sup>6</sup>. This result is proportionate to the rate of decline in both the area and population in the 48dB LAeq 6.5-hour night contour, thereby suggesting these metrics are highly related as one would expect.

Noise contour maps for Heathrow, Gatwick, and Stansted in 2018-19 can be found in Annex G.

#### Heathrow LAeq 6.5hr night contours (actual usage)

Contour (dBA)	Area (sq km)			Population (1000s)			Households (1000s)		
	2011-12	2015-16	2018-19	2011-12	2015-16	2018-19	2011-12	2015-16	2018-19
48	41.1	33.0	30.0	132.4	105.5	95.7	49.8	40.3	33.3
51	20.8	16.7	15.2	64.9	49.9	47.8	22.3	18.8	15.6
54	11.2	8.5	7.6	33.2	21.2	18.5	11.0	7.9	5.8
57	6.2	4.3	3.8	11.7	4.1	2.8	3.6	1.5	0.8
60	3.4	2.3	2.0	3.2	1.3	1.0	1.0	0.5	0.3
63	1.9	1.4	1.1	1.1	<0.1	<0.1	0.3	<0.1	<0.1

#### Heathrow LAeq 8hr night contours (actual usage)<sup>7</sup>

Contour (dBA)	Area (sq km)			Population (1000s)			Households (1000s)		
	2011	2016	2018-19	2011	2016	2018-19	2011	2016	2018-19
48	106.7	104.7	97.6	388.8	368.5	365.5	158.3	149.6	144.5
51	62.2	62.2	58.5	170.1	183.8	182.2	63.9	70.4	67.5
54	34.3	33.5	29.1	81.2	82.2	79.8	27.9	29.1	27.0
57	17.5	16.8	14.9	39.3	37.1	38.9	13.1	12.6	12.6
60	9.3	8.6	7.6	14.4	10.9	11.8	4.5	3.4	3.5
63	5.0	4.6	4.0	3.4	2.5	2.4	1.0	0.7	0.7

<sup>5</sup> Summer 2015 and winter 2015-16.

<sup>6</sup> Estimates of sleep disturbance are based on the exposure-response relationship provided in the World Health Organization Europe Burden of Disease report for estimating the number of people said to be Highly Sleep Disturbed (HSD). When considering these results, it should be noted that the exposure-response relationship is based on the \*-hour Lnight period from 23:00 to 07:00, but in this instance has been applied to data for the 6.5-hour night quota period from 23:30 to 06:00. Figures have been rounded to the nearest 100.

<sup>7</sup> LAeq 8hr night contour results for 2011 and 2016 are based on an average 8hr night period over the respective calendar years, whereas results for 2018-19 represent an average 8hr period over the combined winter 2018-19 and summer 2019 seasons. Differences between the two long-term averaging periods are considered negligible.

## Gatwick Airport

Gatwick has one main runway, along with a standby runway that can currently only be used when the main one is not in operation, and two terminals. Gatwick handled 46.1 million passengers in 2018 and served 199 weekly destinations. It is situated in mostly lightly-populated countryside, although the airport does lie between the towns of Crawley and Horley. The airport is approximately 28 miles (45km) to the south of London and about 2 miles (3km) north of Crawley. It is operating at over 85% of capacity and is completely full at peak times.

### Existing night flight operations

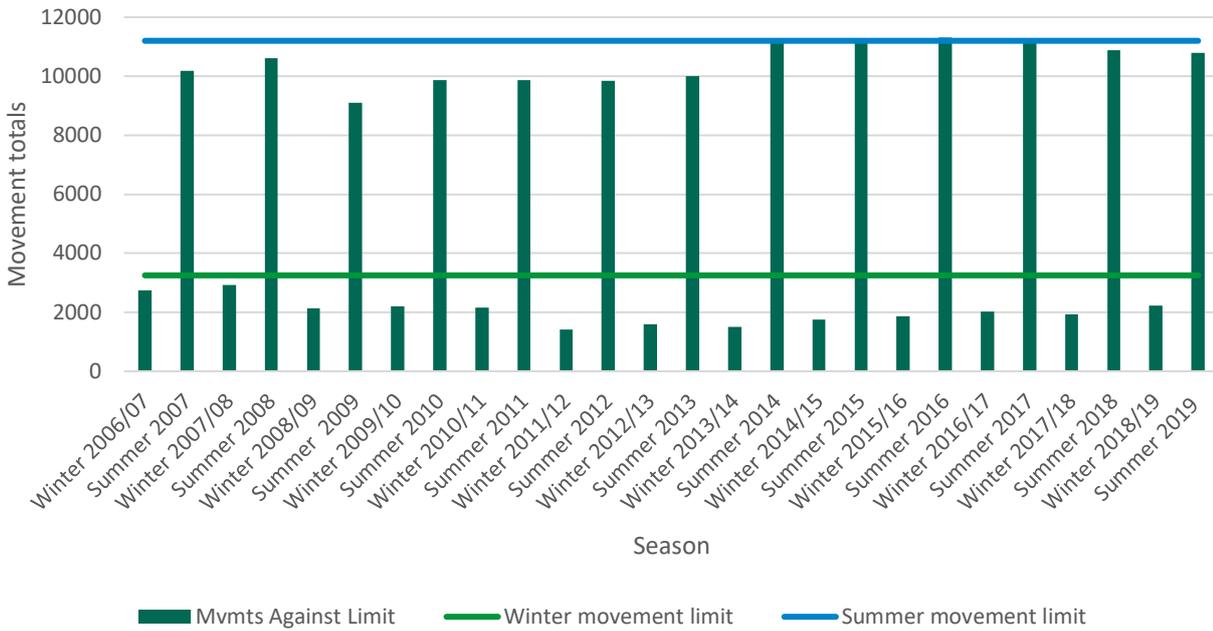
Gatwick's night flights are subject to much greater seasonal variability than Heathrow due to the different business models of the two airports, with a summer movement limit of 11,200 and a winter movement limit of 3,250.

Gatwick has used close to its full movement limit in the summer for many years. There has, however, been spare capacity in each winter season. In winter 2018/19, less than 70% of the movements available were utilised. Night flight activity at Gatwick therefore varied from an average of 53 flights per night in the summer 2019 season to 21 per night in the winter 2018/19 season. There is also significant in-season variability, with the busiest week in summer 2019 averaging 67 flights per night and certain weeks in the winter 2018/19 season, averaging less than 10 flights per night.

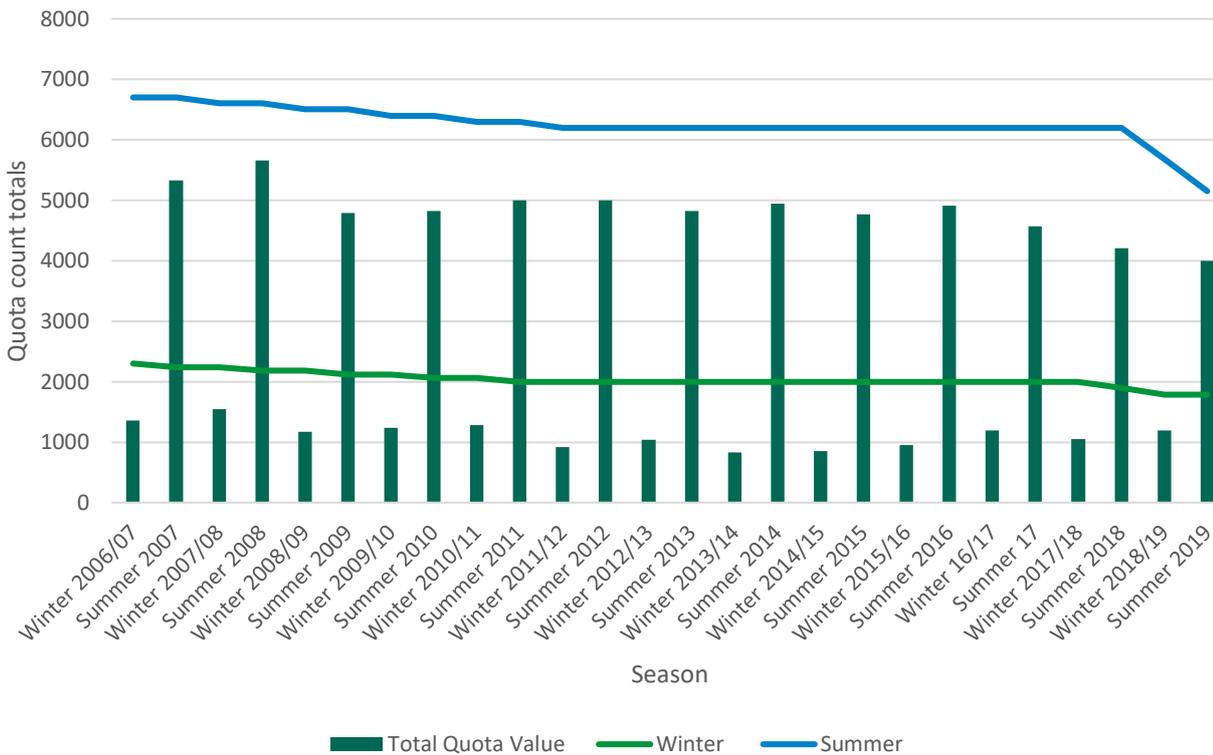
Flights at Gatwick arrive and depart throughout the night, but over two-thirds are pre-2am arrivals. This reflects the business model of the low-cost carriers based at Gatwick who rely on night flights to ensure they achieve the necessary number of rotations during a day in order to make maximum use of their assets. In 2018-19, about 60% of night flights at Gatwick were by low-cost carriers, 20% were full service carriers, and 20% were charter services such as TUI. The most popular services in the night are those between Spain, Greece and Turkey.

Similar to Heathrow, the Government also lowered the QC limits at Gatwick in October 2018. Gatwick continues to use less of its QC limits proportional to its movement limits. For example, in summer 2019 it used 96% of its movement limit but only 78% of its noise quota limit (excluding carryover allowances).

### Gatwick movements by season



### Gatwick QC total by season



### Impacts of aircraft noise at night

Between 2015-16 and 2018-19, Gatwick Airport also saw a reduction in the area covered by the 48dB LAeq 6.5-hour night contour, as well as the number of people residing within it.

During these three years, a 9% reduction was observed in both the area covered by the contour (equivalent to 3.1 square kilometres) as well as the number of people residing within it (equivalent to approximately 400 people).

Contrary to the slowed rate of progress at London Heathrow, the reductions observed over the three-year period to 2018-19 represent significant progress to the four-year period between 2011-12 and 2015-15, whereby land area and population within the 48dB LAeq 6.5-hour night contour increased by 3% and 2% respectively. Also included below are LAeq 8hr night contour results for 2018-19 to compare with previous years at Gatwick.

Whilst the actual size of Gatwick’s noise contour is broadly comparable to Heathrow’s, there is a significant variation in the number of people affected. This is because the area around Gatwick is more rural and sparsely populated than the metropolis of London.

Between 2015-16 and 2018-19, the number of people highly sleep disturbed during the 6.5-hour night (above 48dB LAeq) is estimated to have remained broadly unchanged, at approximately 300 people<sup>8</sup>. This suggests that despite a reduction in both population and area within the LAeq 6.5-hour night contour at Gatwick Airport over the same period, the number of individuals estimated to be highly sleep disturbed remains consistent with 2015-16 levels.

#### Gatwick LAeq 6.5hr night contours (actual usage)

Contour (dBA)	Area (sq km)			Population (1000s)			Households (1000s)		
	2011-12	2015-16	2018-19	2011-12	2015-16	2018-19	2011-12	2015-16	2018-19
48	34.1	35.2	32.1	4.2	4.3	3.9	1.7	1.6	1.5
51	18.1	18.0	17.0	1.2	1.3	1.1	0.5	0.5	0.4
54	9.5	9.0	9.2	0.4	0.5	0.4	0.2	0.1	0.1
57	5	4.6	4.8	0.2	0.3	0.3	0.1	0.1	0.1
60	2.5	2.3	2.5	<0.1	0.1	0.1	<0.1	<0.1	<0.1
63	13	1.2	1.4	<0.1	0.0	0.0	<0.1	0.0	0.0

<sup>8</sup> Estimates of sleep disturbance are based on the exposure-response relationship provided in the World Health Organization Europe Burden of Disease report for estimating the number of people said to be Highly Sleep Disturbed (HSD). When considering these results, it should be noted that the exposure-response relationship is based on the \*-hour Lnight period from 23:00 to 07:00, but in this instance has been applied to data for the 6.5-hour night quota period from 23:30 to 06:00. Figures have been rounded to the nearest 100.

### Gatwick LAeq 8hr night contours (actual usage)<sup>9</sup>

Contour (dBA)	Area (sq km)			Population (1000s)			Households (1000s)		
	2011	2016	2018-19	2011	2016	2018-19	2011	2016	2018-19
48	60.3	73.2	61.7	7.0	9.2	7.8	2.7	3.7	3.1
51	32.9	36.2	32.3	3.0	3.0	2.3	1.2	1.2	0.9
54	18.4	20.3	18.2	1.0	1.2	1.1	0.4	0.4	0.4
57	9.8	10.5	10.0	0.5	0.5	0.5	0.1	0.1	0.2
60	5.2	5.4	5.3	0.3	0.4	0.2	0.1	0.1	0.1
63	2.7	2.8	2.8	0.2	0.2	0.1	<0.1	<0.1	0.0

## Stansted Airport

Stansted has a single runway and one terminal. It carried around 28 million passengers in 2018 and also has a significant freight operation, handling 226,000 tonnes<sup>10</sup>. It is situated 35 miles (56km) north east of London and is surrounded by countryside and small villages to the north, south and east and the town of Bishop's Stortford to the west. Current planning conditions restrict passengers to 35 million passengers per year, a limit of air transport movements to 264,000 per year and the area within the 57 dB LAeq 16hr noise contour to 33.9 square kilometres.

### Existing night flight operations

Stansted has a movement limit of 8,100 in summer and 5,600 in winter. This was increased following the 2017 consultation decision from 7,000 and 5,000 respectively, with the increase provided to take into account flights that operated out of the airport and were exempt from the previous regime as their noise classification was below 83.9 EPNdB.

In recent summer seasons, Stansted has exceeded its movement limit and used carryover from the previous winter season. In winter 2018/19 Stansted also used a similar percentage of its winter movements as Gatwick, approximately 71%. While the seasonal variation is not as high therefore as at Gatwick, the average for the winter 2018/19 season was 26 flights per night, and the summer 2019 average was 40 per night - reaching 48 per night in the busiest summer week.

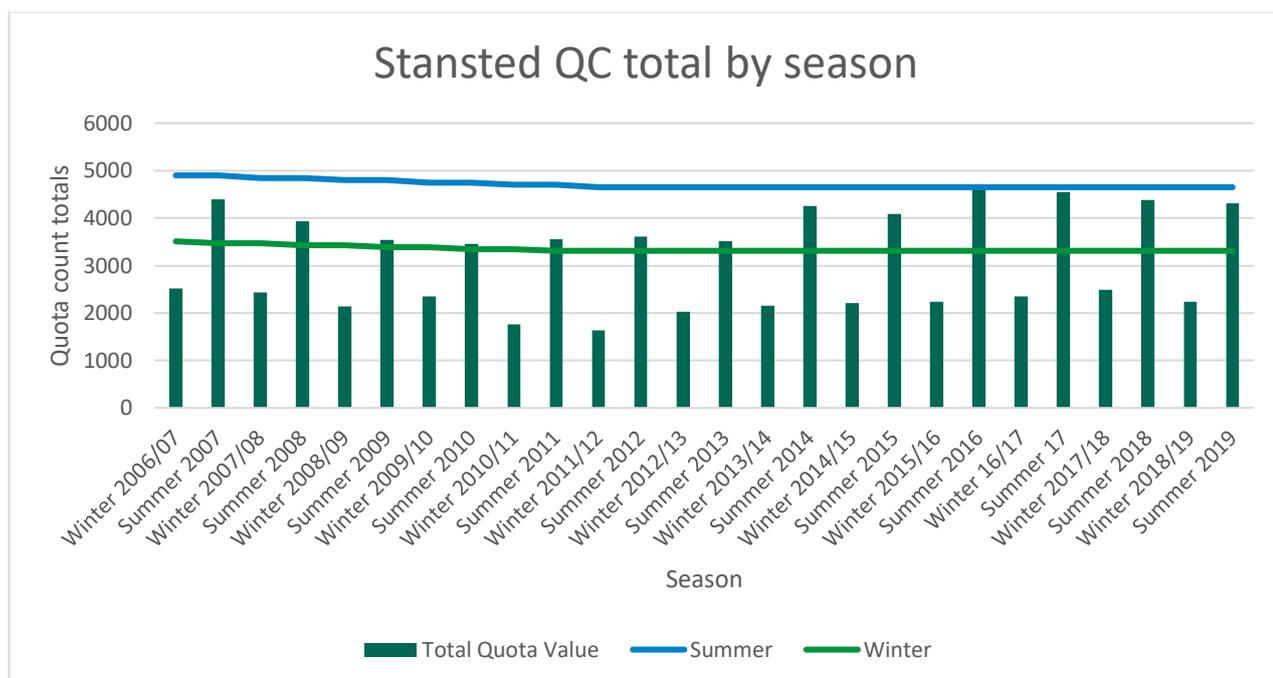
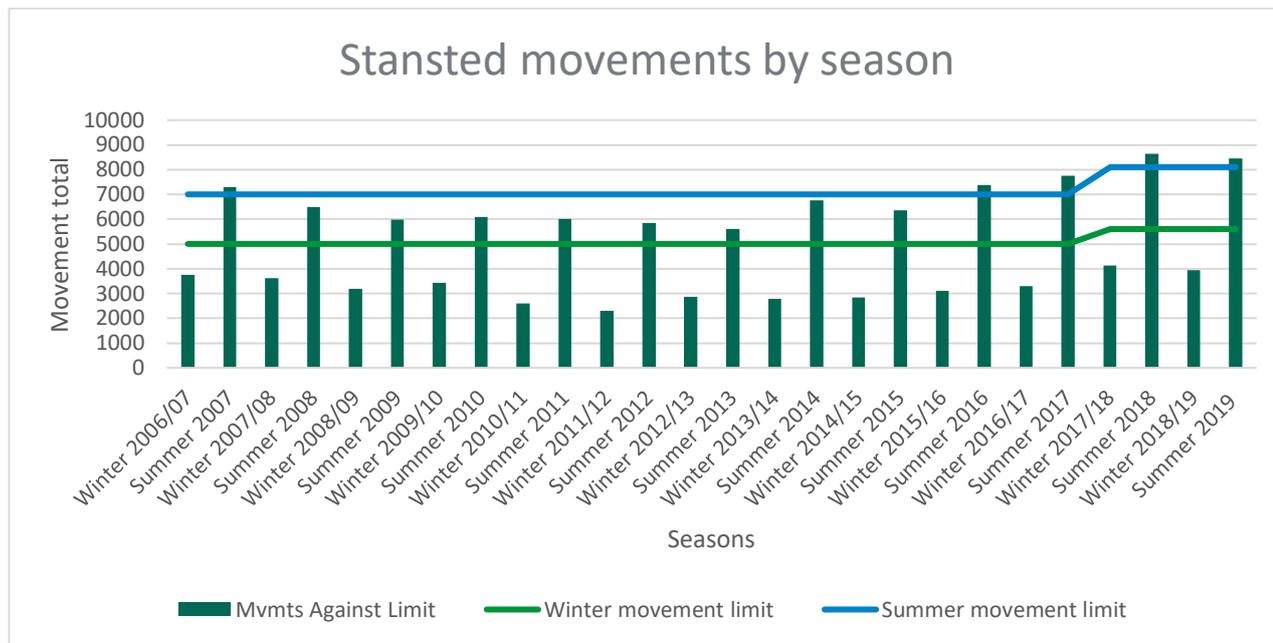
The most common night movements at Stansted are low-cost carriers, which made up approximately 67% of night movements in 2018/19 and are largely concentrated at the beginning and end of the night quota period. Stansted is also a hub for several large freight and express companies, which require the flexibility to fly throughout the night in

<sup>9</sup> LAeq 8hr night contour results for 2011 and 2016 are based on an average 8hr night period over the respective calendar years, whereas results for 2018-19 represent an average 8hr period over the combined winter 2018-19 and summer 2019 seasons. Differences between the two long-term averaging periods are considered negligible.

<sup>10</sup> CAA data. Weekly service: at least 52 passenger flight departures a year

order to ensure timely next day deliveries to key markets. Cargo services make up approximately 21% of Stansted's night movements.

In summer seasons, Stansted uses a greater proportion of its noise quota, approximately 93% in summer 2019, although their QC proportional usage is less in winter seasons, at approximately 67% in winter 2018/19. As a proportion, Stansted uses more of its QC allowances than both Heathrow and Gatwick airports.



#### Impacts of aircraft noise at night

Between 2015-16 and 2018-19, there was a significant increase in the land area covered by the 48dB LAeq 6.5-hour night contour around London Stansted, as well as the number of people residing within it.

The land area covered by the 48dB LAeq 6.5-hour night contour increased by 16% between 2015-16 and 2018-19, while the population within the contour increased by 24%. These percentages are equivalent to an increase in area of 4.9 square kilometres and an increase in population of approximately 900 people.

Over a four-year period between 2011-12 and 2014-15, the area covered by the contour increased by 10%, while population within the contour increased by 31%. This suggests that although the rate of increase in the land area covered by the 48dB LAeq 6.5-hour night contour is increasing, the rate of increase in population residing within the contour is gradually slowing. However, Stansted's 48 dBA LAeq 6.5-hour night contour size is now greater than Gatwick's and the airport now exposes more people to equivalent noise levels. Also included below are LAeq 8hr night contour results for 2018-19 to compare with previous years at Stansted.

The increase in both area and population within the LAeq 6.5-hour night contour at Stansted airport between 2015-16 and 2018-19 has likely contributed to the increase in the number of people estimated to be highly sleep disturbed. Over this three-year period, it is estimated that the number of people highly sleep disturbed during the 6.5-hour night (above 48dB LAeq) has increased by 100 (or 33%), from 300 to 400 people<sup>11</sup>. When considering this result, it is important to acknowledge that there are still two years remaining of the current night noise regime, meaning that progress to reduce noise disturbance could be seen in the latter stages of the current regime.

There have been various factors that have led to this increase in noise. Firstly, overall movements and overall noise quota usage in 2018-19 were slightly higher than in 2015-16. This is despite a slight reduction in average QC per movement. There were also an additional 391 disregarded movements which occurred in 2018-19, which were accounted for in the noise contours, against there being zero disregarded movements in 2015-16. Further, there have also been minor differences in the fleet mix, arrival and departure mix, as well as the easterly and westerly split between years that may also have had a small effect on the final contour area.

The increase in movements at Stansted was planned as part of the Government's 2017 decision. The intent of the increase was to ensure that the users of aircraft that were previously exempt from the restrictions because their aircraft had noise certifications of less than 84 EPNdB, would not be penalised. In implementing this uplift, Stansted Airport's Scheduling Committee, the body that makes decisions on how slots are allocated, allocated a significant proportion of the increased movements to scheduled services that used noisier aircraft.

As mentioned at the beginning of this section, further evaluation will be carried out as part of the second-stage consultation on the regime in 2022. We will be looking at how movement allocations could be ring-fenced to address this type of issue. We believe that whilst Stansted's performance has deteriorated against these measures, there remains the opportunity for the airport to address this before the end of the current regime.

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<sup>11</sup> Estimates of sleep disturbance are based on the exposure-response relationship provided in the World Health Organization Europe Burden of Disease report for estimating the number of people said to be Highly Sleep Disturbed (HSD). When considering these results, it should be noted that the exposure-response relationship is based on the \*-hour Lnight period from 23:00 to 07:00, but in this instance has been applied to data for the 6.5-hour night quota period from 23:30 to 06:00. Figures have been rounded to the nearest 100.

**Stansted L<sub>Aeq</sub> 6.5hr night contours (actual usage)**

Contour (dBA)	Area (sq km)			Population (1000s)			Households (1000s)		
	2011-12	2015-16	2018-19	2011-12	2015-16	2018-19	2011-12	2015-16	2018-19
48	28.0	30.8	35.7	2.9	3.8	4.7	1.3	1.6	1.9
51	14.8	16.2	18.6	0.6	0.9	1.5	0.2	0.3	0.6
54	7.6	8.2	9.5	0.2	0.2	0.4	0.1	0.1	0.1
57	4.2	4.3	4.8	0.1	<0.1	0.1	0.0	<0.1	<0.1
60	2.3	2.3	2.6	0.0	0.0	0.0	0.0	0.0	0.0
63	1.3	1.3	1.4	0.0	0.0	0.0	0.0	0.0	0.0

**Stansted L<sub>Aeq</sub> 8hr night contours (actual usage)<sup>12</sup>**

Contour (dBA)	Area (sq km)			Population (1000s)			Households (1000s)		
	2011	2016	2018-19	2011	2016	2018-19	2011	2016	2018-19
48	47.6	50.3	58.1	5.6	6.2	8.1	2.2	2.5	3.2
51	26.3	27.5	31.6	1.7	3.2	3.9	0.6	1.3	1.6
54	14.3	14.5	16.8	0.6	0.8	1.0	0.2	0.3	0.4
57	7.7	7.5	8.8	0.2	0.2	0.3	0.1	0.1	0.1
60	4.1	3.9	4.6	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
63	2.1	2.1	2.3	0.0	0.0	0.0	0.0	0.0	0.0

<sup>12</sup> LA<sub>eq</sub> 8hr night contour results for 2011 and 2016 are based on an average 8hr night period over the respective calendar years, whereas results for 2018-19 represent an average 8hr period over the combined winter 2018-19 and summer 2019 seasons. Differences between the two long-term averaging periods are considered negligible.