Gatwick Airport
Flight Performance Team
Annual Report 2018

This report covers the period
(1st January 2018 – 31st December 2018)

YOUR LONDON AIRPORT
Gatwick

Contents

About Gatwick Airport

Gatwick is the UK's second busiest airport and the busiest point-to-point airport in Europe flying to over 228 destinations. Its continued growth has ensured the Airport remains a major employer and a cornerstone of the local, regional and national economy.

We acknowledge that communities close to a busy international airport can be adversely affected by aircraft noise and therefore, where possible, we continue to work to lessen this impact.

Noise matters to us and we aim to be a good neighbour. We have a full and comprehensive range of noise management and mitigation measures and we have a number of objectives, obligations and action plan actions with noise targets each year to manage noise. These are published in our Section 106, END Noise Action Plan, Decade of Change and Flight Performance reports together with our noise related key performance indicators.

With the introduction of new aircraft types, such as the Airbus A350-900, Boeing 737-800 MAX and Airbus A320/A321 Neo's, the noise footprint generated by aircraft operations has reduced in area as older, noisier types of aircraft have been withdrawn. While Gatwick Airport continues to grow, the Airport operation strives to minimise its noise impact on the surrounding area and continues to engage with those affected communities in identifying innovative means of mitigation.

ABOUT THIS REPORT

This report contains information on aircraft activity at the Airport and includes details of our performance against a number of noise mitigation measures detailed in the UK Aeronautical Information Publication (AIP). In addition, it also includes data on airfield performance, a report on night flights, an update on the community noise monitoring programme and an analysis of complaints received during the period.

Gatwick's Framework for Noise Management

REGULATION

As a designated airport, the responsibility for aircraft noise policy at Gatwick ultimately lies with the Department for Transport (DfT). In undertaking this responsibility, the DfT has published the noise abatement procedure for Gatwick Airport, these are contained within the Gatwick (EGKK) Aeronautical Information Publication (AIP). In addition, the Airport has its own strategy for mitigating the impact of its aircraft operations on the local community. At Gatwick, it is the responsibility of the Flight Performance Team (FPT) to monitor and report on the adherence to these rules.

The Airport also works with in an international framework set by the International Civil Aviation Organisation (ICAO). One of its main activities is to establish international standards, recommend practices and procedure regarding technical issues of aviation, including noise. ICAO has set progressively tighter certification standards for noise emissions and aircraft operating in member states must conform to these standards.

FLIGHT PERFORMANCE TEAM

This FPT monitors operational performance for all Gatwick traffic on issues such as noise, track keeping, night flying and continuous descent operations (CDO).

The team is also responsible for recording investigating and responding to aircraft noise complaints and undertaking detailed analysis as well as monitoring airline compliance against noise mitigation measures as detailed in the AIP.

In order to facilitate this work, the Airport invests over £300,000 a year on noise monitoring. This includes a Noise and Track Keeping system that combines radar input from Air Traffic Control (ATC)

with data from our fleet of fixed and mobile monitors placed around the Airport. A full scale upgrade of this system was confirmed in later 2018 and will be delivered over 2019.

The team also actively engages with our airlines to improve their adherence to the noise mitigation measures and, in addition, manages the night-time restrictions on flying at Gatwick.

The team regularly reports to the Airport's Flight Operations Performance and Safety Committee (FLOPSC) and to the Airport's Noise and Track Advisory Monitoring Group (NaTMAG).

NOISE AND TRACK KEEPING SYSTEM

The Noise and Track Keeping system monitors all aircraft traffic within a 30 miles radius of the Airport, up to 40,000 feet, and automatically records any infringements of the departure noise limits, deviations from the departure flightpaths, as well as monitoring adherence to our other noise mitigation measures.

The Noise and Track Keeping System was previously provided by Casper but will be replaced in 2019 by a new system.

FLIGHT OPERATIONS PERFORMANCE AND SAFETY COMMITTEE (FLOPSC)

FLOPSC is made up of representatives from the Airport's operations team, the FPT, our airlines, the DfT, CAA, Air Navigation Solutions (ANS) and NATS. It meets on a bi-monthly basis throughout the year to review operational performance, adherence to noise and track keeping rules and to share best practice.

NOISE MANAGEMENT BOARD

The Noise Management Board (NMB) is made up of a wide range of industry expects and stakeholders and as formed in response to one of the recommendations of the Independent Review of Arrivals.

The core role of the NMB is to develop, agree, oversee and maintain a co-ordinated noise management vision and subsequent strategies for Gatwick, on behalf of stakeholders, with an aim to reduce the impact of noise on the local community.

NOISE AND TRACK MONITORING ADVISORY GROUP (NaTMAG)

This committee includes representatives from the Airport's Consultative Committee, local councils, the DfT, NATS, ANS, airlines and the Airport. It meets every quarter to discuss the Airport's performance against the range of rules and regulations pertaining to aircraft operations. It gives an opportunity for representatives of local communities to scrutinise the Airport's reports and to discuss things that may be a cause of concern.

SUSTAINABLE AVIATION

Gatwick Airport Limited is a member of Sustainable Aviation, whose long term strategy sets out the collective approach of UK aviation to tackling the challenge of ensuring a sustainable future for our industry. Sustainable Aviation was launched in 2005 and brings together the main players from UK airlines, airports, manufacturers and air navigation service providers.

The Flight Performance Team has worked throughout the year with the Sustainable Aviation Operations Improvements Group. The 'mission statement' of this group is *"Working with the industry in the UK and internationally to trial and implement innovative low noise and emission procedures."*

Sustainable Aviation have produced a Road Noise Map which outlines the future aspirations of the industry to reduce the impact of aircraft noise over the coming years. For more information visit: **www.sustainableaviation.co.uk**

Air Traffic Data

This section details how the Airport is performing in conjunction with its Key Performance Indicators (KPI's), the change in traffic numbers over the course of the year, and provides information of the types of aircraft and airlines which operate at the Airport.

FIGURE 1 – THE PREVIOUS 5 YEARS OF KEY PERFORMANCE INDICATORS

Parameter	12 Month Performance Averages[1]				
	2018	2017	2016	2015	2014
Track keeping performance (% on track)[2]	98.08%	98.06%	98.56%	99.71%	99.28%
24hr CDO (% achievement)[4]	90.74%	90.48%	88.58%	89.75%	92.61%
Day/Shoulder CDO (% achievement)	90.80%	90.56%	88.18%	89.21%	92.43%
Core night CDO (% achievement)	90.03%	89.60%	92.90%	95.32%	95.25%
1000ft Infringements (No.)	0	0	0	0	0
1000ft Infringements (No. below 900ft)	0	0	0	0	0
Departure Noise Infringements (Day)	0	0	0	0	0
Departure Noise Infringements (Night/Shoulder)	0	2	1	0	0
Individual complainants	836	997	2324	1746	3366
Total noise complaints received[5]	24447	24658	17715	15189	21712
Enquiry response performance target is 95% within 8 days	99.98%	99.89%	46.55%	93.89%	73.39%
West/East Runway Split (%)	62/38	78/22	67/33	70/30	67/33

FIGURE 2 – KEY PERFORMANCE INDICATORS (KPIs) 2018 IN COMPARISON TO A 2011 BASELINE

Parameter	12 Month Performance Averages in Comparison to 2011[1]				
	+/-	2018[6]	2017	2011	2006
Track keeping performance (% on track)[2]	▲	98.08%	98.06%	97.42%	98.17%[3]
24hr CDO (% achievement)[4]	▲	90.74%	90.48%	90.49%	80.79%
Day/Shoulder CDO (% achievement)	▲	90.80%	90.56%	90.19%	79.9%
Core night CDO (% achievement)	▼	90.03%	89.60%	93.96%	89.6%
1000ft Infringements (No.)	▼	0	0	3	11
1000ft Infringements (No. below 900ft)	▼	0	0	1	6
Departure Noise Infringements (Day)	-	0	0	0	10
Departure Noise Infringements (Night/Shoulder)	▼	0	2	4	2
Individual complainants	▲	836	997	343	587
Total noise complaints received[5]	▲	24447	24658	2673	4791
Enquiry response performance target is 95% within 8 days	▲	99.98%	99.89%	KPI 95%	
West/East Runway Split (%)	-	62/38	78/22	67/33	68/32

[1] The colour indicates the most recent 12 month performance compared to the 2011 END NAP Baseline, with green showing improvement and red a decline in performance, the directional arrow indicating performance compared to the previous 12 month performance.
[2] Track keeping statistics measurement changed on the 26th May 2016 due to the Route 4 amendment, all SID's are now included in the total figure.
[3] This figure did not include deviations from prop types or those due to weather.
[4] As a result of the Independent Review of Arrivals, it was recommended (Imm-05) that the CDO monitoring altitude be increased from 6,000ft to 7,000ft as of 1st August 2016.
[5] Complaints are recorded in line with our published complaints handling policy. The revised policy, published in November 2014, advised that only one complaint per day is recorded per individual. On the 29th September 2016, there was a further revision to our complaints handling policy which now allows individuals to make multiple complaints per day and these will each be recorded. It is important to note that since January 2018, complaints which have been deleted from the Casper system are no longer counted in the complaint statistics when they had been previously. Complaints are only deleted if they contain abusive, obscene or threatening language.
[6] It should be noted that there were two separate radar outages to the Casper noise and track keeping (NTK) system which occurred between the 11th and 12th July 2018 and between 10th and 13th August 2018 inclusive. As a result of these outages, data has been omitted from the statistics for these dates and so these figures may not be exact for the period. Complaint data is unaffected.

FIGURE 3 - THE AVERAGE NUMBER OF AIRCRAFT MOVEMENTS PER 24 HOUR PERIOD IN 2018

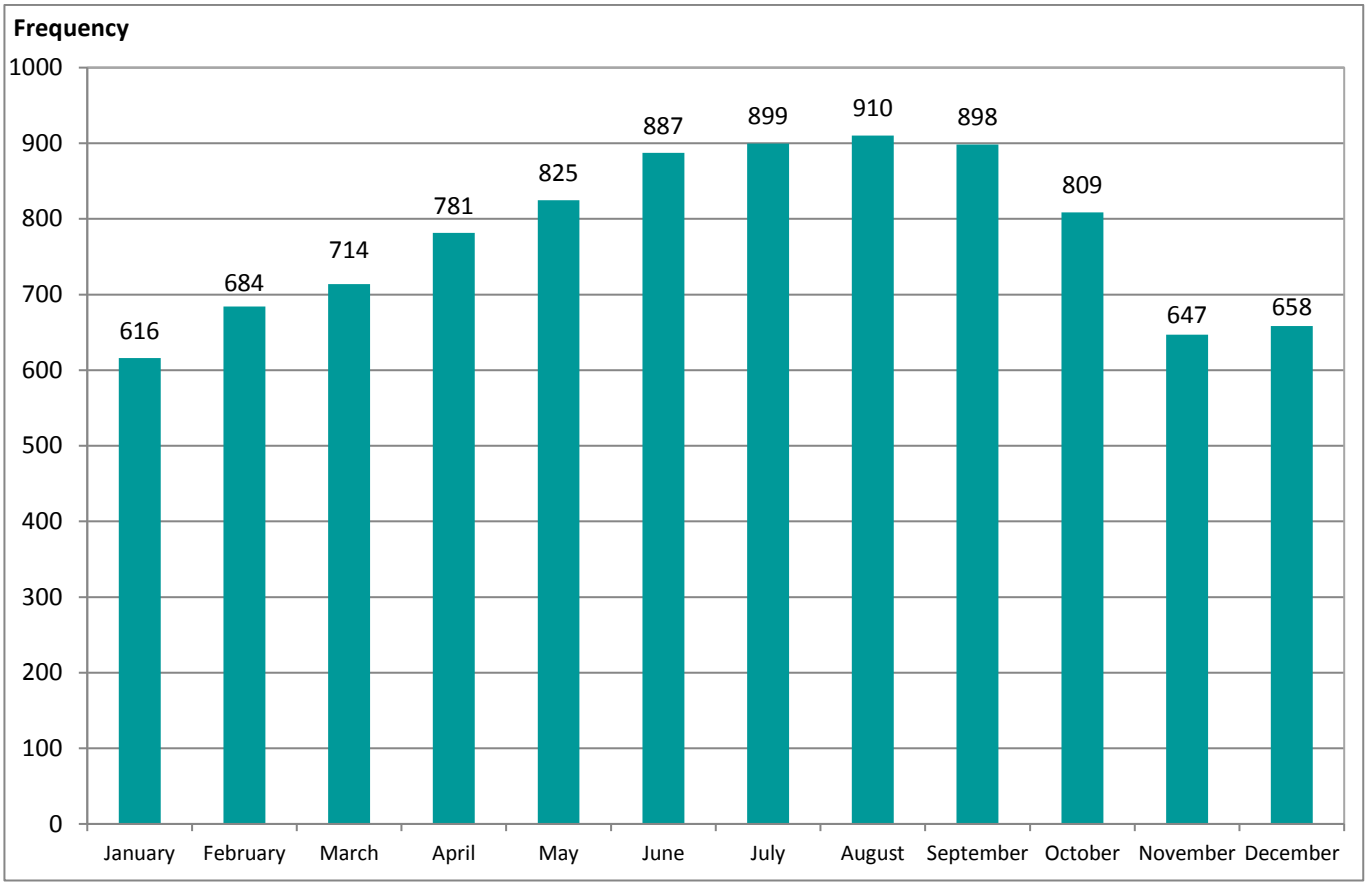


FIGURE 4 - THE TOTAL AIRCRAFT MOVEMENTS PER YEAR (2006-2018)

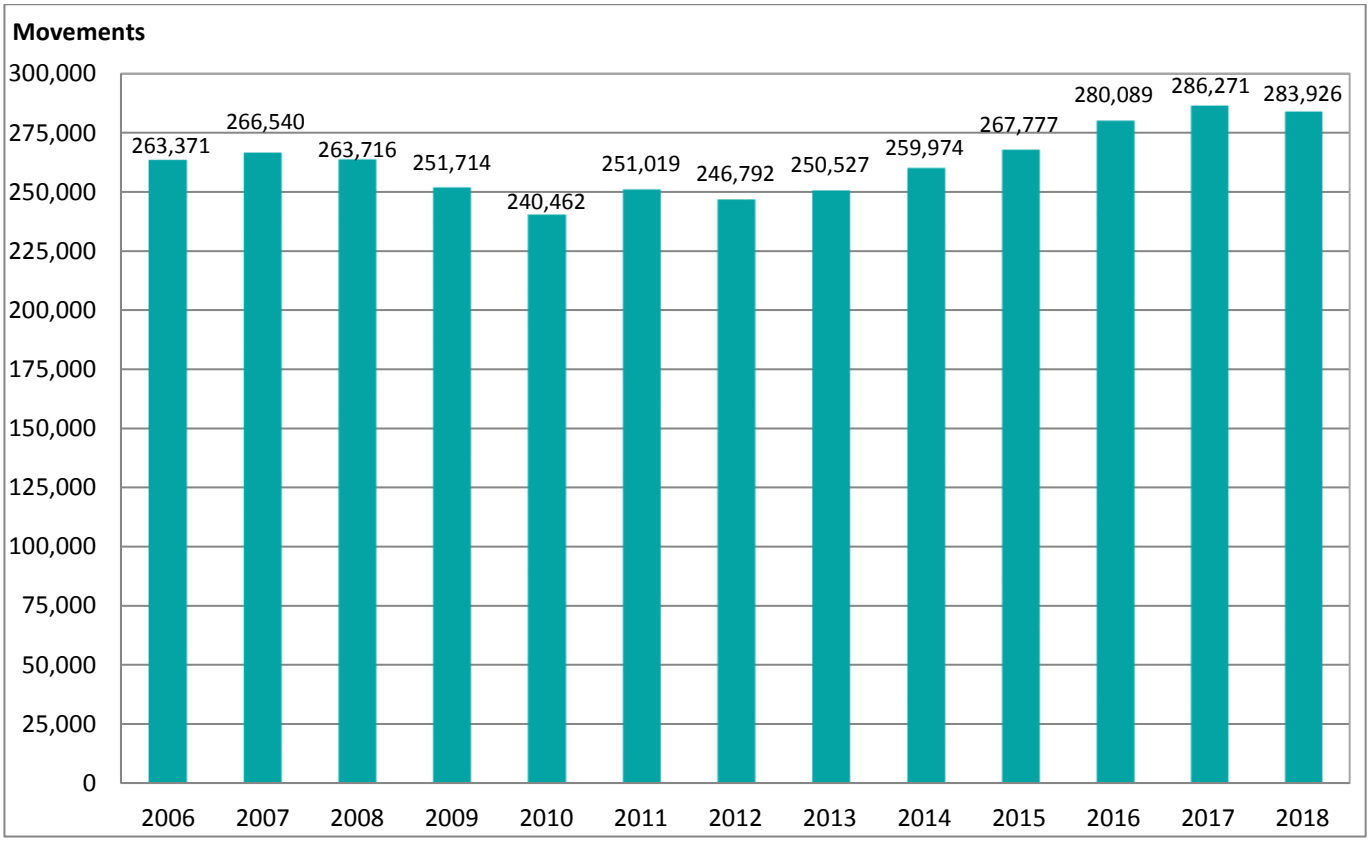


Figure 3 shows the average number of air traffic movements per 24 hour period over the year. This illustrates that the peak months at Gatwick are during the summer with over 900 flights recorded on some of our busiest days.

In 2018, there was a decrease of about 0.8% in overall movements compared to 2017. **Figure 4** shows the changes in traffic figures over the past several years. This year has been the busiest year for total passenger numbers. The mix of aircraft types that operate at Gatwick continues to evolve with airlines introducing newer, more efficient and quieter types as shown in **Figure 5.**

Norwegian, TUI and Qatar Airways have a regular Boeing 787 Dreamliner service operating from Gatwick. Gatwick Airport has dedicated infrastructure in place to allow the Airbus A380 to operate. The A380 is significantly more fuel efficient and quieter than the first generation 4-engine jumbos it replaces. Emirates Airlines operates three daily A380 services between Gatwick and Dubai. The Airbus A350-900 has also been introduced which has been designed to reduce fuel burn significantly as well as being a quieter aircraft. Cathay Pacific and China Airlines both operate A350 services from Gatwick.

The Airbus A319 is the most numerous aircraft type operating at Gatwick and makes up a large part of the easyJet fleet, who remain Gatwick's biggest operator. They have also introduced the A320 and A321 Neo family of aircraft which are much quieter than their counterparts due to more advanced engine and aircraft design. Boeing have also introduced their B737 MAX 8 aircraft which Norwegian, Travel Service Airlines, WestJet and Icelandair have adopted as part of their fleets. The Airport operates a differential charging structure based on an aircraft noise footprint and Nitrogen Oxide (NO_X) emissions to encourage airlines to use the quietest and most fuel efficient aircraft.

FIGURE 5 - THE TOTAL NUMBER OF AIRCRAFT MOVEMENTS BY TYPE IN 2018 & 2017 WITH PERCENTAGE CHANGE

Aircraft Type	2018	2017	Percent +/-
Airbus A319	82305	87821	-6.28%
Airbus A320	57440	94363	-39.13%
Boeing 737	43899	47074	-6.75%
Airbus A320 Neo	39870	316	>100%
Boeing 787	10684	6738	+58.56%
Airbus A321 Neo	8672	10	>100%
Boeing 777	8461	8232	+2.78%
Boeing 757	5659	6433	-12.03%
Airbus A330	4830	3907	+23.62%
Embraer 195	4823	5180	-6.89%
Airbus A321	3296	13650	-75.85%
Boeing 747	2759	3159	-12.66%
Airbus A380	2228	2094	+6.40%
Boeing 767	1722	2170	-20.65%
ATR 72	1530	1338	+14.35%
Bombardier CSeries/Airbus A220	1190	742	+60.38%
Airbus A350	1142	618	+84.79%
Embraer 190	1050	928	+13.15%
B737 MAX 8	790	4	>100%
Airbus A310	294	440	-33.18%
Embraer 175	266	54	>100%
Cessna Citation	163	168	-2.98%
Embraer 170	126	8	>100%
Embraer RJ145	96	80	+20.00%
Canadair Regional Jet	89	28	>100%
Gulfstream	68	108	-37.04%
Dassault Falcon	59	70	-15.71%
Airbus A340	46	16	>100%
Helicopters	46	66	-30.30%
Other Small Jets	319	334	-4.49%
Other Large Jets	4	0	>100%

WIND DIRECTION

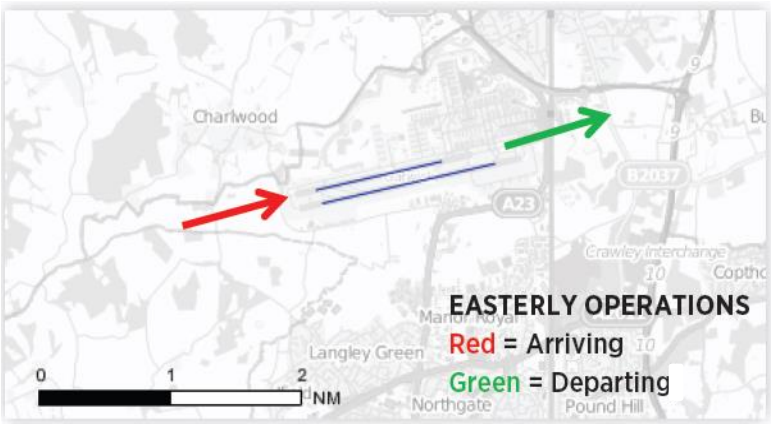
South westerly and westerly winds prevail for much of the year, typically around 70 per cent of the time. Changes in the direction of operation will influence overflight of areas as sometimes aircraft are only apparent when the airfield is operating in one direction or another.

The direction of operation is determined by ATC, who monitor wind speed and direction on the airfield and at different airspace levels up to 3,000ft. The position of the wind is under constant review, which is why the operation can change direction more than once in a day. The weather forecast on television, radio or in the media is not always a reliable indicator of what is happening at Gatwick, since these forecast for the public relates to wind speeds at ground level, whereas specialist forecasting is used to determine wind direction and speeds aloft, these can vary considerably from those recorded at ground level.

In any given month, the direction of runway operation can vary dramatically, with no set seasonal pattern.

It is not unusual for the runway to operate in the same direction for several weeks, and this can be very noticeable to communities underneath the normal flight routes when the Airport switches direction. Conversely, it is not uncommon for the runway direction to change several times in a 24 hour period. **Figure 7** overleaf shows the split in runway direction during 2018 where Gatwick predominately experienced westerly operations.

FIGURE 6 – THE MAPS SHOW THE DIRECTION OF RUNWAY USE DURING EASTERLY AND WESTERLY OPERATIONS



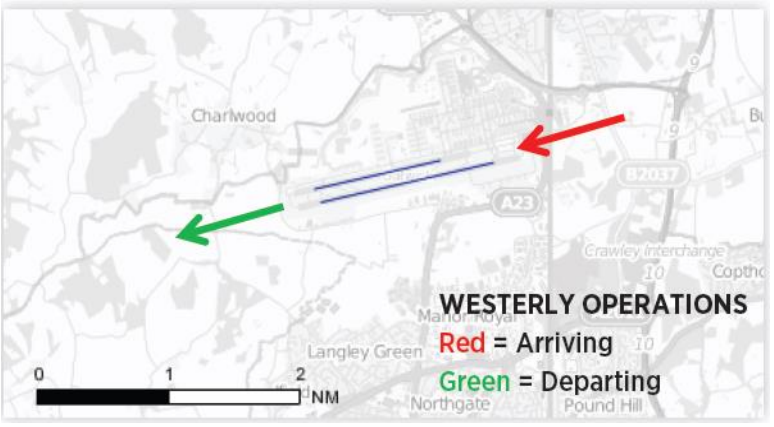


FIGURE 7 – THE SPLIT IN RUNWAY DIRECTION FOR 2018

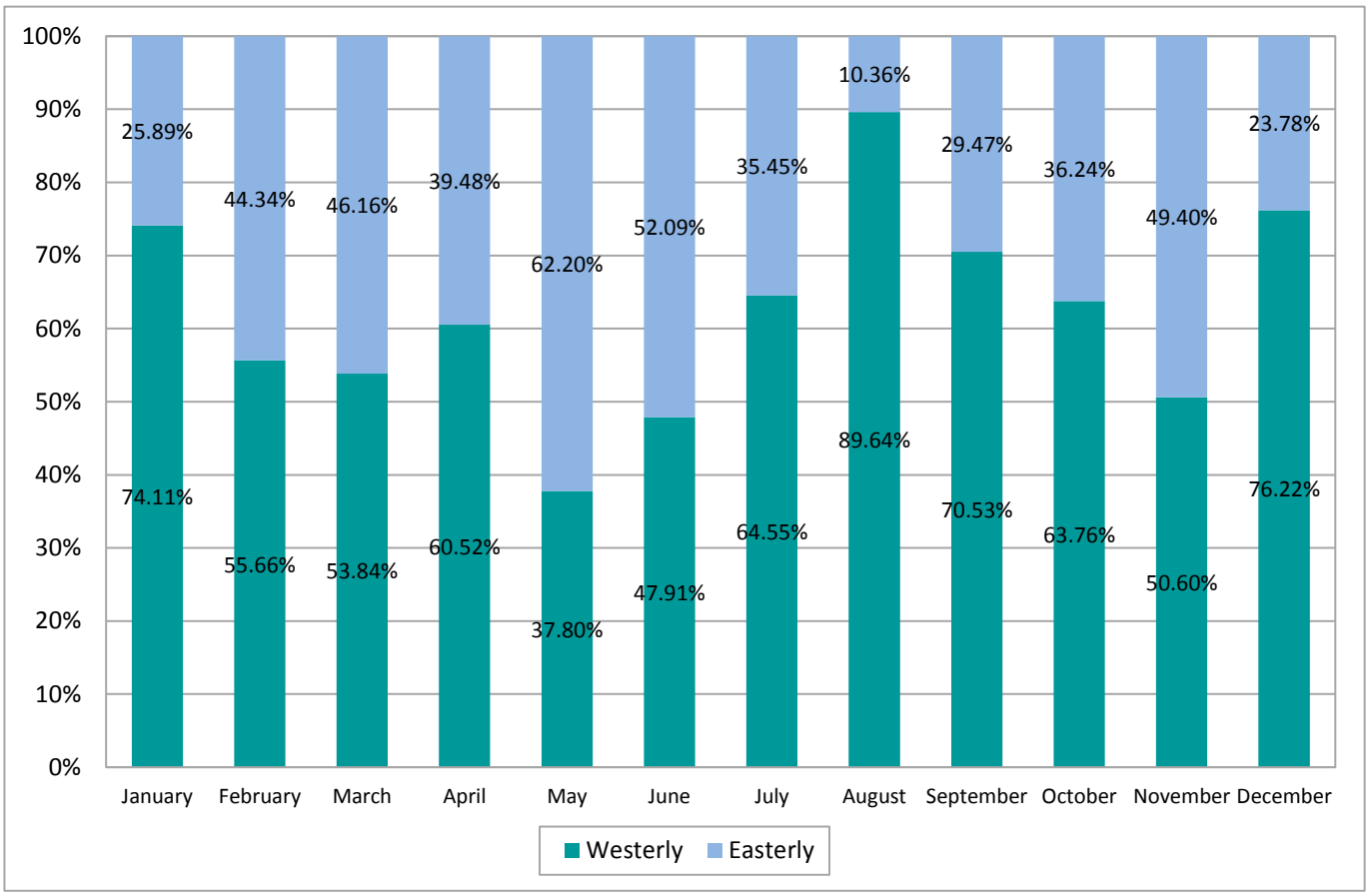
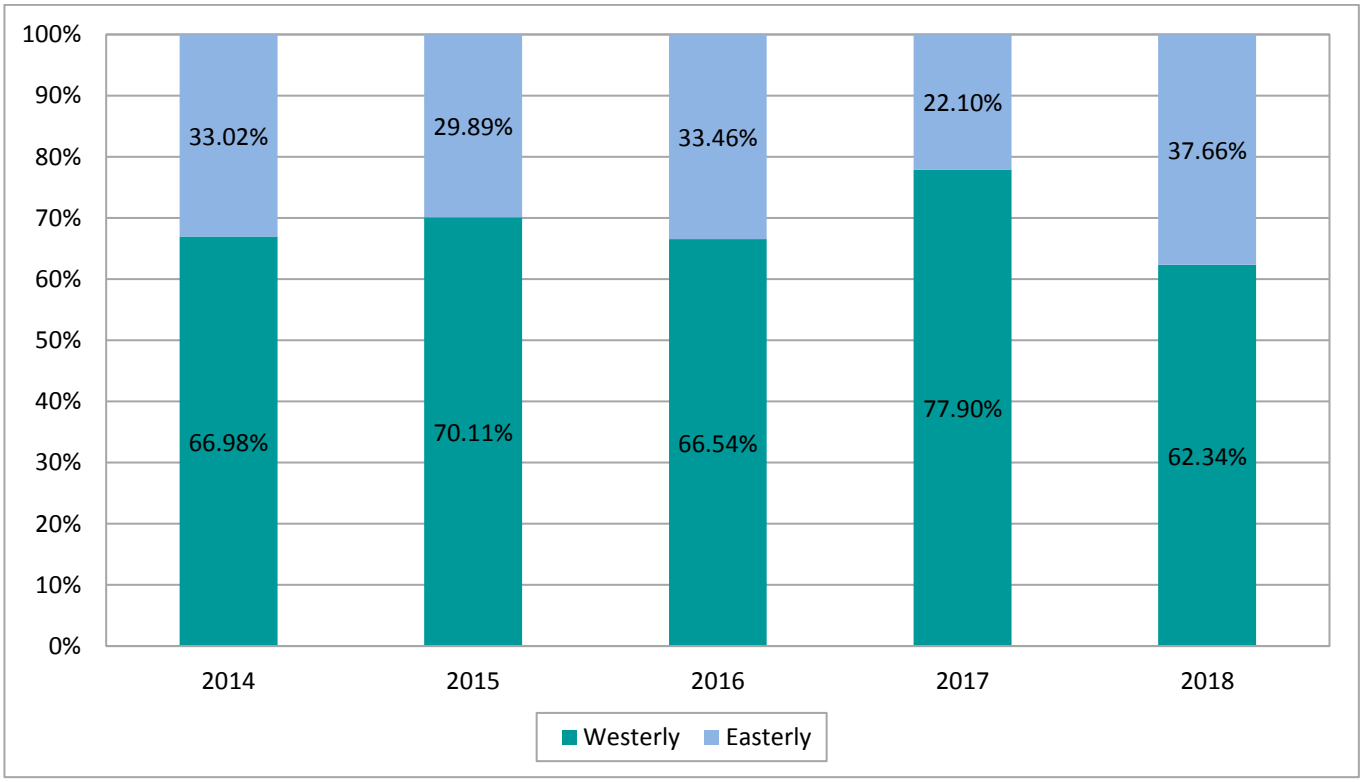


FIGURE 8 – THE ANNUAL SPLIT IN RUNWAY DIRECTION OVER THE LAST 5 YEARS



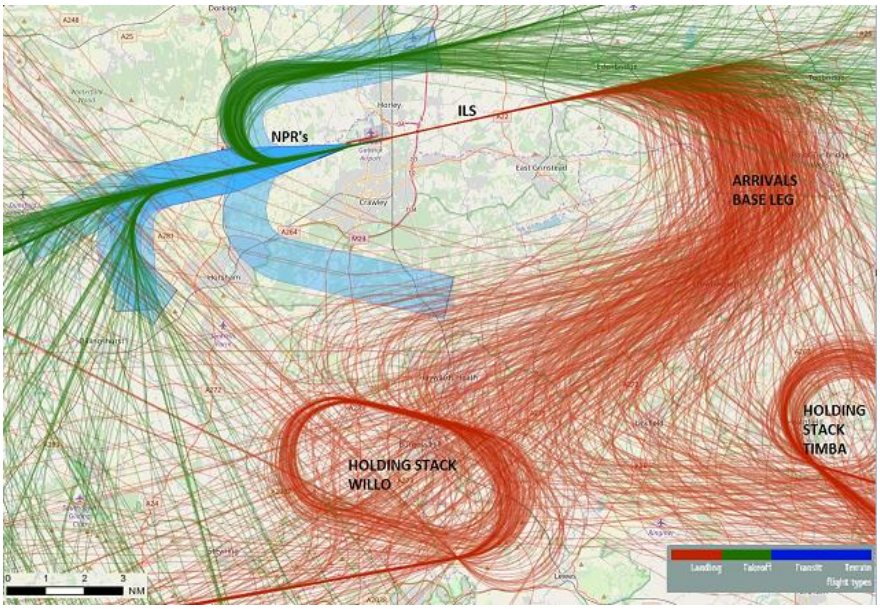
WHERE AIRCRAFT FLY

Large parts of Kent, Surrey and Sussex are overflown by Gatwick traffic as they may be beneath the departure routes or arrival swathes. However, those towns and villages further away from the airfield will experience overflight from Gatwick aircraft at relatively higher altitudes. Gatwick does not operate in isolation; the south east corner of the UK is one of the world's busiest sectors of airspace and Gatwick's own aircraft movements need to be integrated with traffic travelling to and from other airports in the region.

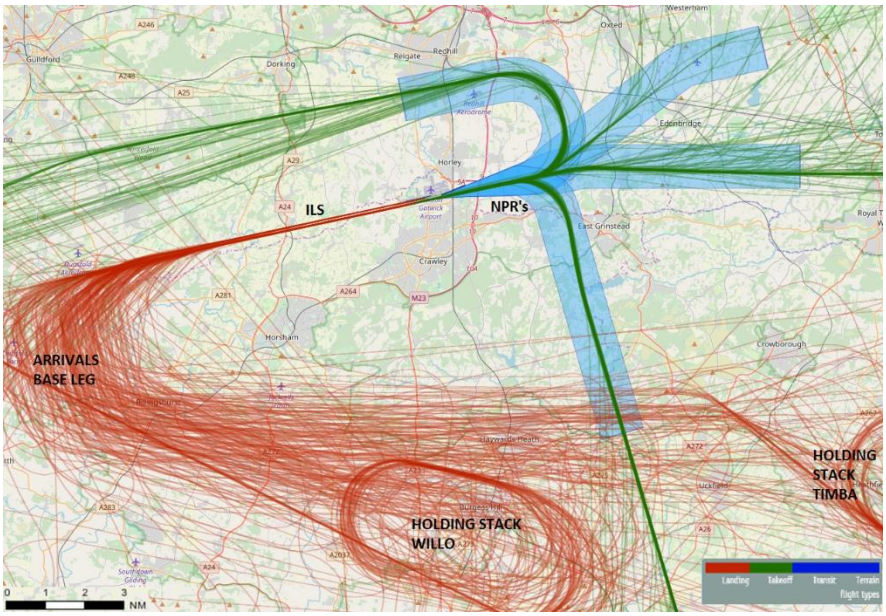
Aircraft are required to take off and land into the wind and therefore the prevailing wind direction determines the direction of airfield operation. When the wind is coming from the west, aircraft will depart towards the west and arrive from the east (westerly operations). During these times aircraft will arrive over East Sussex and West Kent. Conversely, winds from the east mean that aircraft take off to the east and arrive from the west (easterly operations), thus arriving aircraft pass over West Sussex.

FIGURE 9 - THE FOLLOWING MAPS SHOW A TYPICAL 24 HOUR PERIOD OF WESTERLY OPERATIONS AND EASTERLY OPERATIONS

WESTERLY OPERATIONS



EASTERLY OPERATIONS



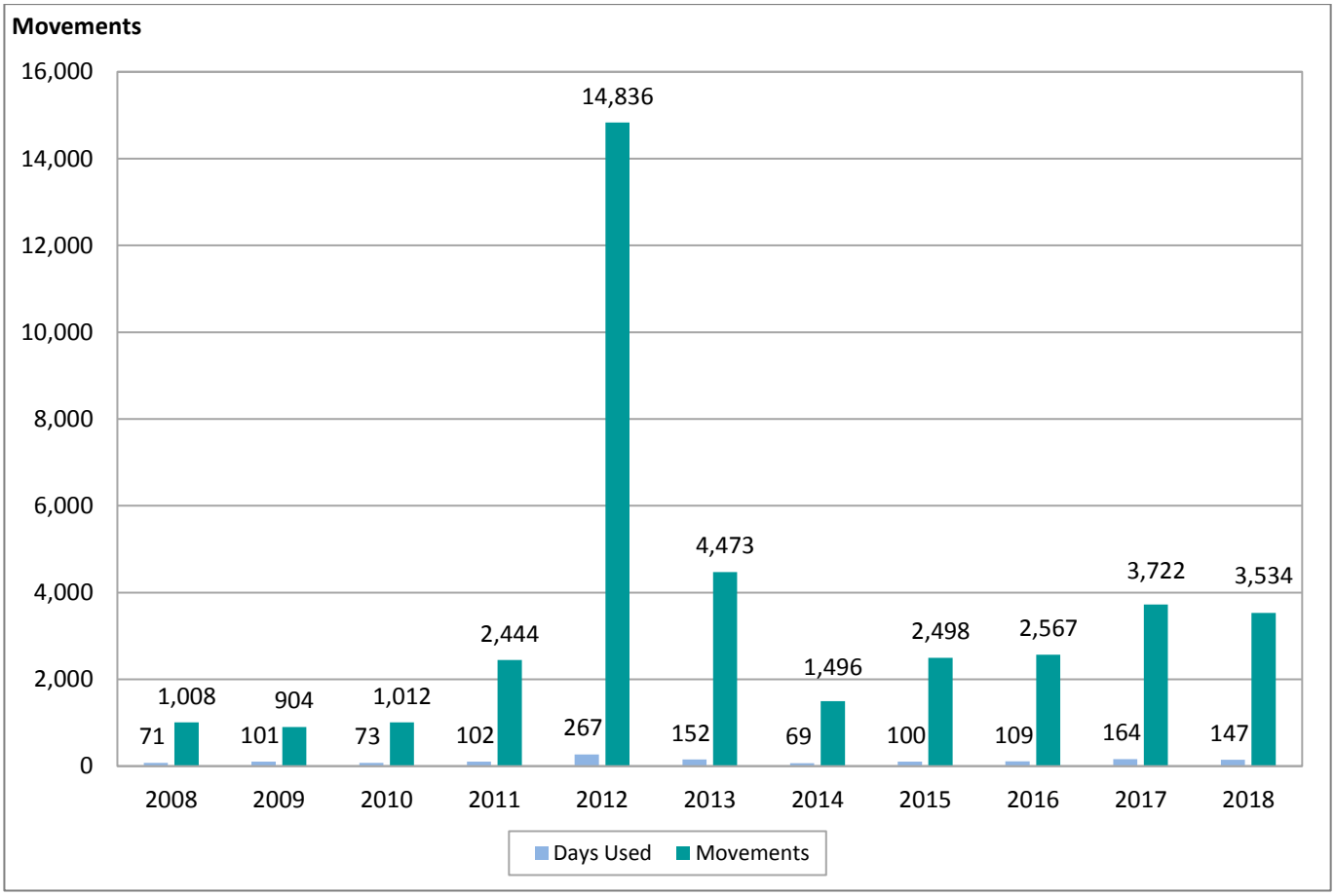
STANDBY RUNWAY

The Airport has one main runway, designated 08R/26L, which is 3,316 metres long. When the main runway is out of operation there is a standby runway, designated 08L/26R, adjacent to the main runway that can be used. This runway is shorter than the main runway and is not equipped with an Instrument Landing System and under current regulations, due to its proximity to the main runway, it cannot be used at the same time.

The standby runway is normally only used during periods of essential maintenance on the main runway and this is normally carried out during night time when the Airport is not as busy. As the runway is constantly in use it requires frequent inspections and a maintenance programme to ensure the surface and all lighting fixtures remain in a fully operational and in a safe condition.

Figure 10 shows how the use of the standby runway has changed over the years. There was an increased usage of northern runway operations in 2012 as the main runway was undergoing extensive rehabilitation. The standby runway has been utilised recently over the last couple of years during maintenance works in the night period, therefore we have seen an increased usage.

FIGURE 10 – THE USE OF THE STANDBY RUNWAY COMPARED TO PREVIOUS YEARS



Departing Aircraft

NOISE PREFERENTIAL ROUTES (NPR's)

Aircraft departing Gatwick Airport are required to follow specific departure flight paths for the initial stages of flight called Noise Preferential Route (NPRs). The nine NPR's at Gatwick were designed and set by the DfT to avoid overflight of built-up areas where possible. NPR's provide volumes of pre-defined airspace within which Standard Instrument Departure (SID) routes are established where aircraft must follow on departure from an aerodrome and so provide certainty as to which areas will be exposed to aircraft activity.

An NPR consists of a 'centreline' and an associate compliance monitoring swathe (3km across, i.e. 1.5km either side of the NPR centreline). These NPR's are mapped in **Figure 11**. As long as aircraft remain within the corridor boundaries up to the minimum vectoring altitude described below, they are deemed to be on-track. A map illustrating the Noise Preferential Routes is also available from **www.gatwickairport.com/noise**

Air Traffic Control (ATC) is responsible for the routeing of aircraft once they are airborne and each departure will be assigned a route to follow, however once aircraft reach a minimum vectoring altitude of 4,000ft (or 3,000ft dependent on departure route and time) at any point along an NPR, they may be vectored off the route by ATC onto more direct headings to their destinations.

There are also occasions when ATC direct aircraft off of NPRs for safety reasons, such as to avoid adverse weather conditions along the intended route or to maintain safe separation from other traffic.

Aircraft that leave the NPR before the required minimum altitude are classified as track deviations. Track keeping performance at Gatwick is generally very good, however the westerly wrap around route designated 26LAM/Route 4 has always presented a challenge for modern aircraft to fly as the tight turn was designed in 1968 when very different types of aircraft types were in operation. Flights leaving the route below the required height are automatically flagged and details are sent to the airline for investigation. Our Flight Operations Performance & Safety Committee (FLOPSC) regularly review track keeping performance. Our track keeping performance is detailed later in the report.

PRECISION NAVIGATION

The basic structure of the UK's airspace was developed over 40 years ago and has changed relatively little since. Since then there have been huge changes, including radical technological changes in the design of aircraft and the navigational aids used by pilots and air traffic controllers to direct or route aircraft through the airspace together with a hundred fold increase in demand for aviation.

Europe's entire airspace needs modernisation. It was designed decades ago in the late 1960's and early 1970's when there were far fewer aircraft in the sky and the systems used for navigation were much less sophisticated. In the UK, for example, flightpaths have barely changed in 40 years, yet we have twice as many aircraft in the air. It is the public demand for air travel that has driven this increase in aircraft traffic and therefore explains why 2018 has been our busiest year for total passenger numbers.

There is probably no other industry or infrastructure system in the UK which has remained unchanged for such a long time.

Precision Navigation technology is a more precise navigation method that allows aircraft to navigate using GPS coordinates rather than traditional ground-based navigational aids. This will result in aircraft having a track keeping accuracy of ±1 nautical miles for 95% of its flight time.

This should result in several important advantages:

- Greater certainty of what areas will be overflown, thereby reducing noise in certain areas.
- Environmental benefits include reduced fuel burn and associated reduction in CO_2 and NO_x emissions.

- Air traffic controllers and flight crew can plan their routes more easily and with greater precision.
- Better arrival routeing and management reduces fuel burnt in stack holds and enables more continuous descents.
- Noise reductions from less aircraft holding at low levels are also expected.

In 2014, Gatwick Airport became the UK's first airport to introduce Precision Area Navigation (P-RNAV) on all departure routes.

The advent of Precision Navigation has resulted in the tracks of departing aircraft being more concentrated within the boundaries of the current NPRs and a subsequent improvement in track keeping performance on all the published departure routes with one exception.

The route known as 26LAM/Route 4, the wrap around route that initially heads west, then turns back on itself 180^0 and passes to the north of the airfield, has always presented a challenge for modern jets. It was designed to accommodate propeller-driven aircraft and early jets that were around in the late 1960s. Implementing P-RNAV on this route required aircraft to fly outside of the current NPR, as approved by the Civil Aviation Authority (CAA); aircraft on a P-RNAV departure on this route were not currently classified as off-track as they were following the published route.

Following the introduction of P-RNAV, the CAA conducted a Post-Implementation Review (PIR) to ensure that the tracks flown by aircraft were compliant with regulations. They identified Route 4 as necessitating immediate attention therefore the CAA asked the Airport to design a solution to rectify the issue. It now requires all Standard Instrument Departure routes (SID's) to be counted in the track keeping statistics whereas previously, the P-RNAV SID's were not included. The Route 4 modification came into effect as planned on the 26th May 2016 and was monitored for a six month period from 26th May to 26th November 2016. During this time, Gatwick Airport engaged with the CAA, our airlines, air traffic control and our airspace designers to improve adherence to the amended route.

Following the PIR, the CAA concluded that the modified Route 4 SID's achieved a satisfactory replication of the nominal track of the corrected conventional SID. The CAA therefore decided to conform the P-RNAV SID designs currently published in the UK Aeronautical Information Publication (AIP) as permanent.

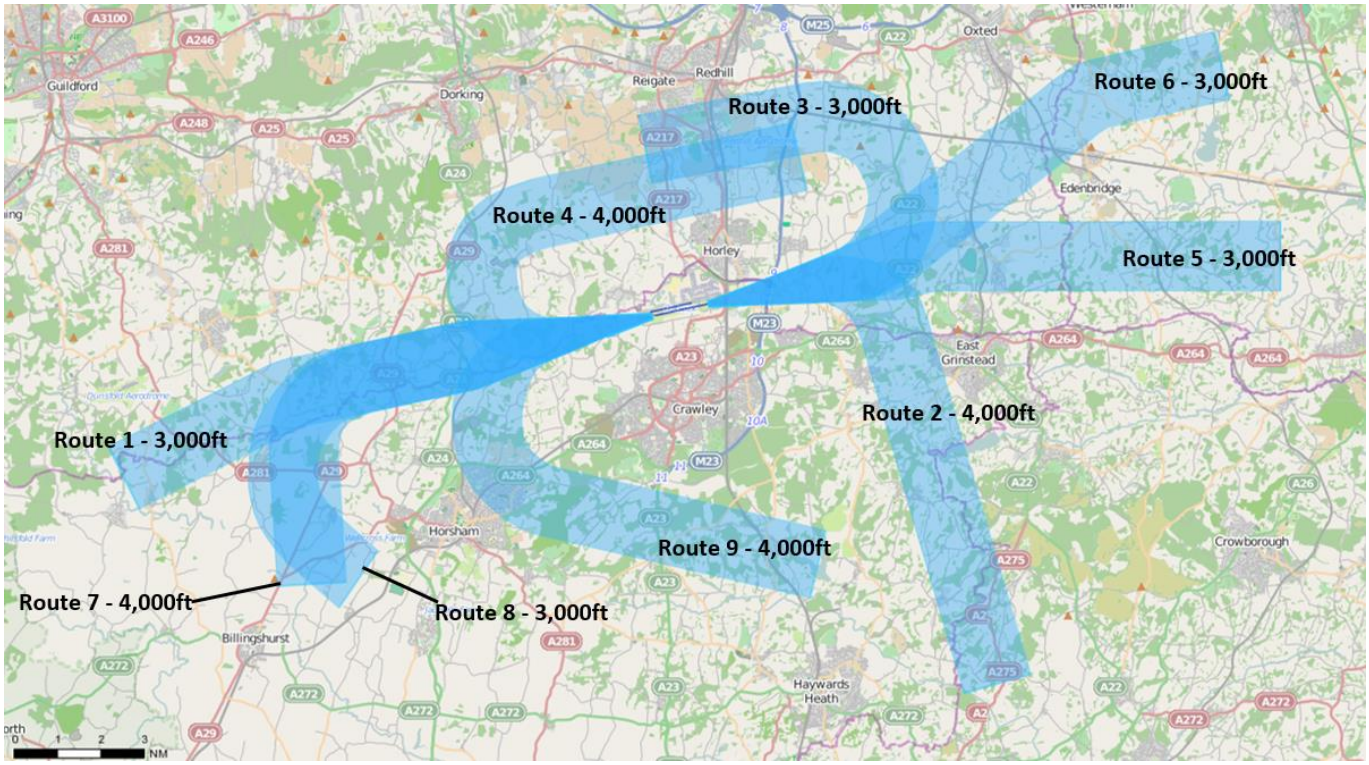
Following the quashing of the CAA's April 2017 decision by consent, Gatwick are working to revert the Route 4 conventional SID's to their position as they were before 7th April 2017. In support of this, Gatwick completed a comprehensive safety review. Following validation by an independent Instrument Flight Procedure Designer, the changes were submitted to the CAA for approval in May 2018. (Note: as previously briefed this will not change the distribution of traffic).

Route 4 P-RNAV SID's will remain in place but have reverted to a temporary status, as was the case prior to the CAA's decision in April 2017. A redesign of the Route 4 P-RNAV SID's will be necessary through the development of a new Route 4 airspace change proposal. This will be led by ANS/Osprey who have been appointed by Gatwick Airport to lead this work.

The Airport is focused on following the correct procedure taking into account the various relevant factors to achieve an end result as soon as possible. This required rigorous legal process and a final outcome is likely to take up to two years to achieve. The Airspace Change Process, as set in CAP1616, requires a consultation phase in which communities will have the opportunity to contribute and influence.

There has also been a modification to our 08CLN/Route 5 NPR which has been in place since 30th March 2017, as advised by the CAA. Previously, aircraft were flying slightly to the south of the NPR centreline and this modification aimed to better replicate the existing conventional SID route and bring aircraft back towards the centreline. This was monitored by the CAA for a six month period to ensure aircraft were operating as anticipated. We are currently awaiting a decision on the outcomes of this monitoring period.

FIGURE 11 – MAP OF THE NOISE PREFERENTIAL ROUTES AT GATWICK AIRPORT USED BY DEPARTING AIRCRAFT WITH MINIMUM VECTORING ALTITUDE FIGURES



Departures - Track Keeping

Track deviations tend to occur for larger aircraft types which are slower to climb and turn. These tend to take longer to reach their designated minimum heights, as previously referenced. There are also other factors which can affect track keeping such as weather avoidances, which include strong winds, cumulonimbus cloud formations leading to thunderstorm activity.

Details of track keeping performance by aircraft type are shown in **Figure 12.** The A319 is the most widely used aircraft type at Gatwick and has an excellent record for track keeping.

FIGURE 12 – TOP 20 TRACK KEEPING PERFORMANCE BY AIRCRAFT TYPE 2018

Aircraft Type	Total Departures	Percentage On Track
Airbus A319	41,154	98.79%
Airbus A320	28,718	96.36%
Boeing 737	21,948	98.72%
Airbus A320 Neo	19,934	99.72%
Boeing 787	53,39	98.20%
Airbus A321 Neo	43,35	99.75%
Boeing 777	4,231	97.71%
Boeing 757	2,830	96.08%
Airbus A330	2,437	98.15%
Embraer 195	2,411	99.88%
Airbus A321	1,647	93.32%
Boeing 747	1,379	94.27%
Airbus A380	1,114	87.25%
Boeing 767	861	98.14%
ATR 72	765	100.00%
Bombardier CSeries /Airbus A220	595	99.83%
Airbus A350	571	93.87%
Embraer 190	525	98.67%
Boeing 737 MAX 8	395	96.96%
Airbus A310	147	99.32%

*Due to two separate radar outages to the Casper flight tracking system which occurred between the 11th and 12th July 2018 and between 10th and 13th August 2018 inclusive, data has been omitted from the statistics for these dates.

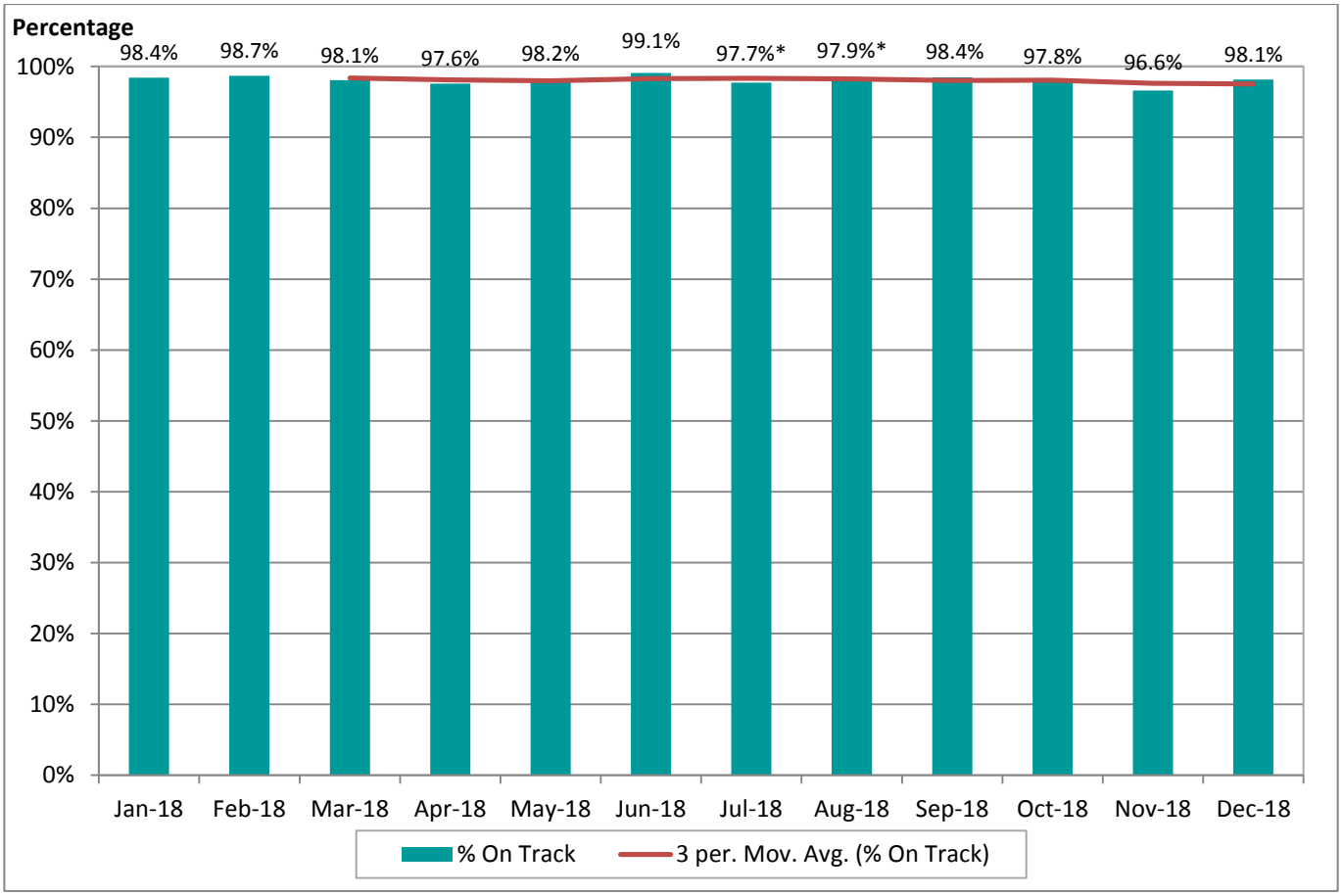
FIGURE 13 – TOP 40 TRACK KEEPING PERFORMANCE BY AIRLINE 2018

Airline	Total Departures	Percentage On Track
EasyJet	61,258	98.17%
British Airways	24,863	97.90%
Norwegian	15,652	98.66%
TUI Airways	6,078	99.18%
Thomas Cook Airlines	4,196	99.02%
Vueling Airlines	4,155	99.18%
Ryanair	3,617	99.31%
Aer Lingus	2,226	99.64%
Virgin Atlantic Airways	2,089	95.93%
Aurigny Air Services	2,033	99.80%
TAP Air Portugal	1,279	99.92%
Emirates	1,095	87.03%
Turkish Airlines	1,054	93.07%
Flybe	945	99.89%
WestJet	937	98.72%
Air Europa	735	99.59%
Iberia Express	722	99.86%
Air Baltic	713	98.46%
Ukraine International Airlines	683	97.22%
Air Transat	666	97.90%
WOW Air	645	91.94%
Qatar Airways	487	97.54%
Icelandair	379	79.42%
Signature Flight Support	375	98.93%
Air Malta	356	100.00%
Wizz Air	335	95.52%
Cathay Pacific Airways	334	91.92%
Royal Air Maroc	330	99.70%
Cobalt Air	306	97.71%
Air Arabia Maroc	297	99.66%
Rossiya	282	99.29%
Level Airlines	268	95.52%
Titan Airways	266	97.74%
Enter Air	244	99.59%
China Airlines	237	96.62%
Travel Service Airlines	192	96.35%
Belavia	174	94.25%
Rwandair	160	95.63%
Tunisair	148	100.00%
Georgian Airways	118	94.92%

FIGURE 14 – TRACK KEEPING PERFORMANCE IN 2018

Month	Total			Westerly			Easterly		
	Deviations	Departures	% Deviations	Deviations	Departures	% Deviations	Deviations	Departures	% Deviations
Jan-18	150	9,546	1.57%	142	7,004	2.03%	8	2,542	0.31%
Feb-18	127	9,577	1.33%	123	5,370	2.29%	4	4,207	0.10%
Mar-18	211	11,065	1.91%	196	5,930	3.31%	15	5,135	0.29%
Apr-18	281	11,715	2.40%	266	7,111	3.74%	15	4,604	0.33%
May-18	226	12,788	1.77%	122	7,937	1.54%	104	4,851	2.14%
Jun-18	120	13,301	0.90%	99	6,428	1.54%	21	6,873	0.31%
Jul-18*	300	13,029	2.30%	288	8,829	3.26%	12	4,200	0.29%
Aug-18*	253	12,323	2.05%	249	10,866	2.29%	4	1,457	0.27%
Sep-18	209	13,472	1.55%	202	9,505	2.13%	7	3,967	0.18%
Oct-18	274	12,530	2.19%	258	7,966	3.24%	16	4,564	0.35%
Nov-18	327	9,705	3.37%	314	4,904	6.40%	13	4,801	0.27%
Dec-18	189	10,191	1.85%	184	7,762	2.37%	5	2,429	0.21%

FIGURE 15 – TRACK KEEPING PERFORMANCE BY MONTH IN 2018



Airfield Noise

Gatwick Airport is committed to mitigating and reducing noise disturbance caused by aircraft operating on the ground. This includes aircraft on stand, taxiing to and from the runway and during the landing and take-off phases of flight. Gatwick is a signatory to the Departure Code of Practice published in association with Sustainable Aviation.

THERE ARE FOUR PRIMARY ELEMENTS WHICH MAKE UP THE DEPARTURES CODE OF PRACTICE:

1. REDUCING NOISE ON THE GROUND

In the past, when on stand, aircraft were reliant on Auxiliary Power Units (APU) for electrical supply. APUs are small jet engines, usually in the tail of the aircraft, which produce a significant amount of noise.

In order to minimise the time that APUs are operated Gatwick Airport provides a system of Fixed Electrical Ground Power (FEGP) on all aircraft stands. FEGP provides aircraft with the necessary power to operate its electrical and air conditioning systems. The availability of FEGP, during the core hours, is measured each month and is consistently close to 100%.

2. REDUCING NOISE AND FUEL EMISSIONS IN THE TAXI STAGE

Aircraft taxiing to or from the runway would normally use all engines, however by only starting all engines close to a point when cleared for take-off, this has the potential to reduce noise, save fuel and reduce emissions.

Gatwick Airport encourages Airlines to use reduced engine taxiing where possible and safe.

3. AIRPORT COLLABORATIVE DECISION MAKING (ACDM)

This aims to create a more efficient operation to reduce the amount of time aircraft spend holding on taxiways, in stacks and on the runway.

This is achieved by the introduction of new technology and the integration of some airport systems so that airport operator, airlines, ground handlers, ANS, NATS or ATC work closely together to achieve optimum performance.

4. CONTINUOUS CLIMB OPERATIONS

Rather than flight stages of level flight, aircraft that can climb to their cruise altitude will use less fuel and emit less greenhouse gases. This will require close co-ordination between Air Traffic Control sectors to maintain the climb.

ENGINE RUNS

The Airside Operations Team at Gatwick conducts regular audits of airfield processes, infrastructure and activities and they are specifically concerned with reducing noise from aircraft operations on the ground.

As is common at major airports throughout the world, some maintenance and servicing work is conducted at Gatwick Airport. British Airways, easyJet and Virgin Atlantic have hangers and operate major repair centres at the Airport. The construction of the new Boeing hangar commenced during 2018.

It is therefore a necessity that there is some engine testing conducted at Gatwick. However, there are limits in place concerning the maximum number of tests that can be conducted and there are strict regulations regarding when and where testing can be conducted in accordance with the S106 legal agreement.

All testing must be authorised in advance by the Airfield Operations Team and there is a ban on testing during the night-time.

Figure 16 illustrates the number of engine runs conducted during 2018 by month. Typically, there are more instances during the winter months when fleets are more likely to receive their regular servicing.

FIGURE 16 – THE NUMBER OF ENGINE RUNS CONDUCTED DURING 2018 PER MONTH

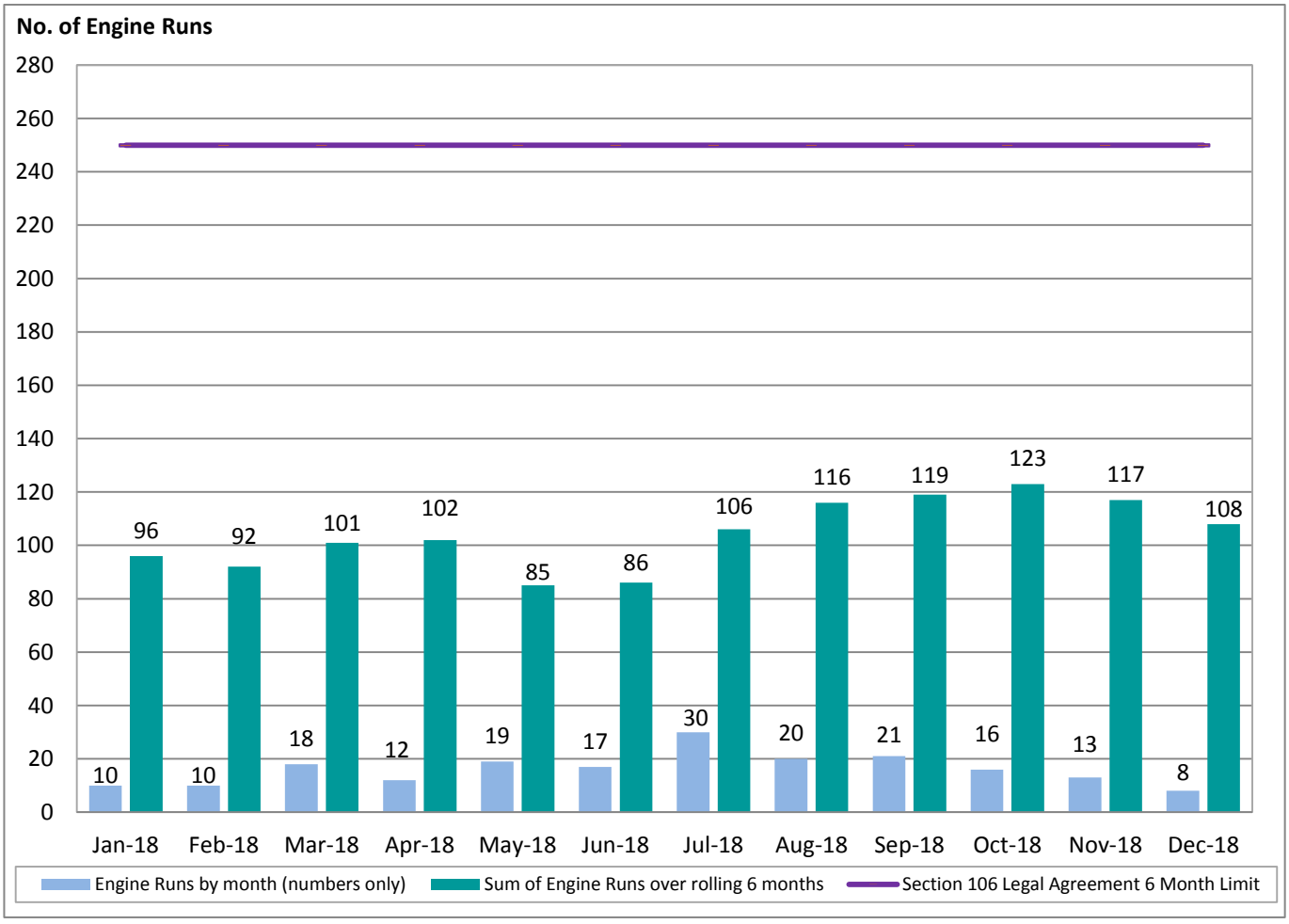
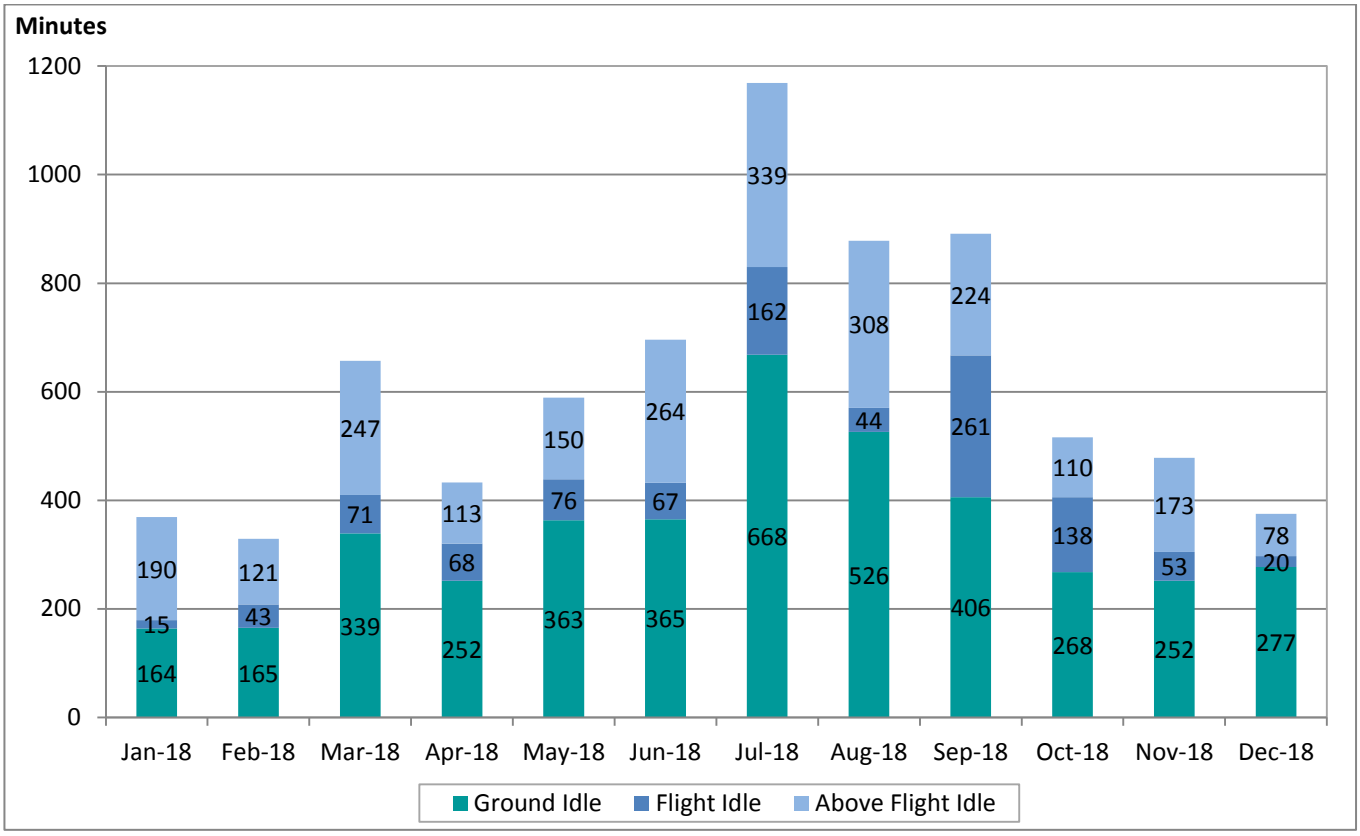


FIGURE 17 - THE ENGINE RUNNING DURATIONS PER MONTH IN 2018



AUXILIARY AND GROUND POWER UNITS

An Auxiliary Power Unit (APU) is a small device in the tail of an aircraft that provides energy for functions other than propulsion. These provide electrical power to the aircraft's systems when the main engines are off. The primary function is to provide power to start the main engines and on the ground they are used to allow aircraft to operate autonomously of group power equipment. In some cases, aircraft may need to receive power from an external power source called a Ground Power Unit (GPU).

If a GPU is not available, aircraft can use APU's which can generate unnecessary noise and Gatwick Airport has a statutory duty to protect the surrounding community from noise generated by aircraft operations and equipment on the ground. It is the policy of Gatwick Airport to ensure that Auxiliary Power Unit (APU) running and other activities generating ground noise are carried out in a manner which will cause least disturbance to the surrounding community, consistent with maintaining a safe and efficient airfield operation.

In order to limit the use of APUs, there are restrictions on the duration they are allowed to operate. FEGP is provided on all stands at Gatwick so APU usage should be kept to a minimum. In order to enforce these restrictions, the Airfield Operations Team regularly conducts audits of the whole airfield. APUs are normally shut down as soon as the aircraft is connected to the FEGP system, however aircraft may be allowed for limited durations during periods of very hot or cold weather to ensure passenger comfort.

Not all aircraft have APUs. Certain propeller driven aircraft, which also operate at Gatwick, need an alternative power source if the FEGP should become unavailable. In these instances, GPUs are utilised. The operation of GPUs are strictly controlled and only allowed when the FEGP, the mains power provided by the aircraft, is unavailable, or where there is a particular reason why an aircraft cannot utilise the FEGP.

FIGURE 18 - THE RESULTS OF THE AUXILIARY POWER UNIT AUDITS IN 2018

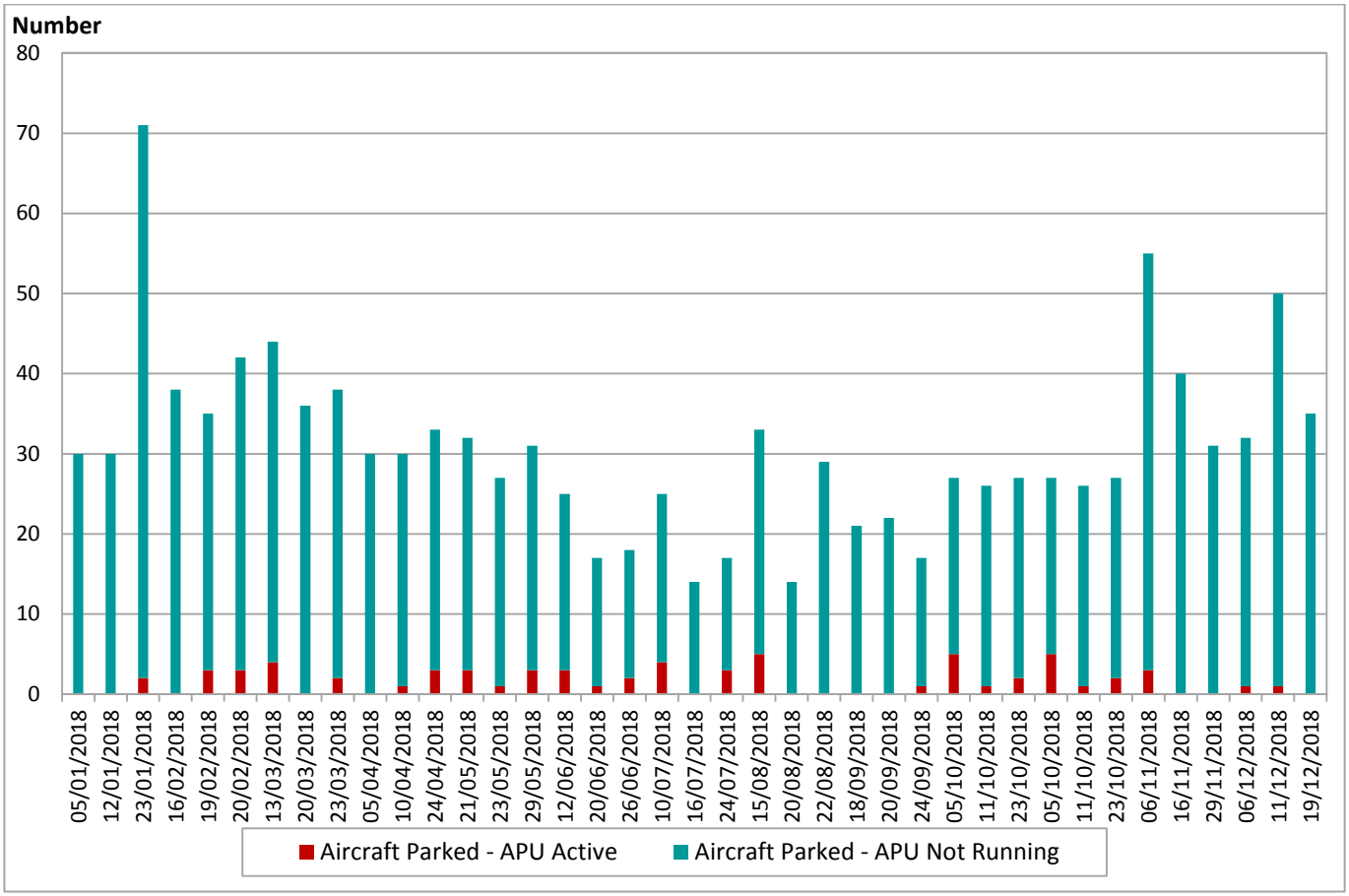
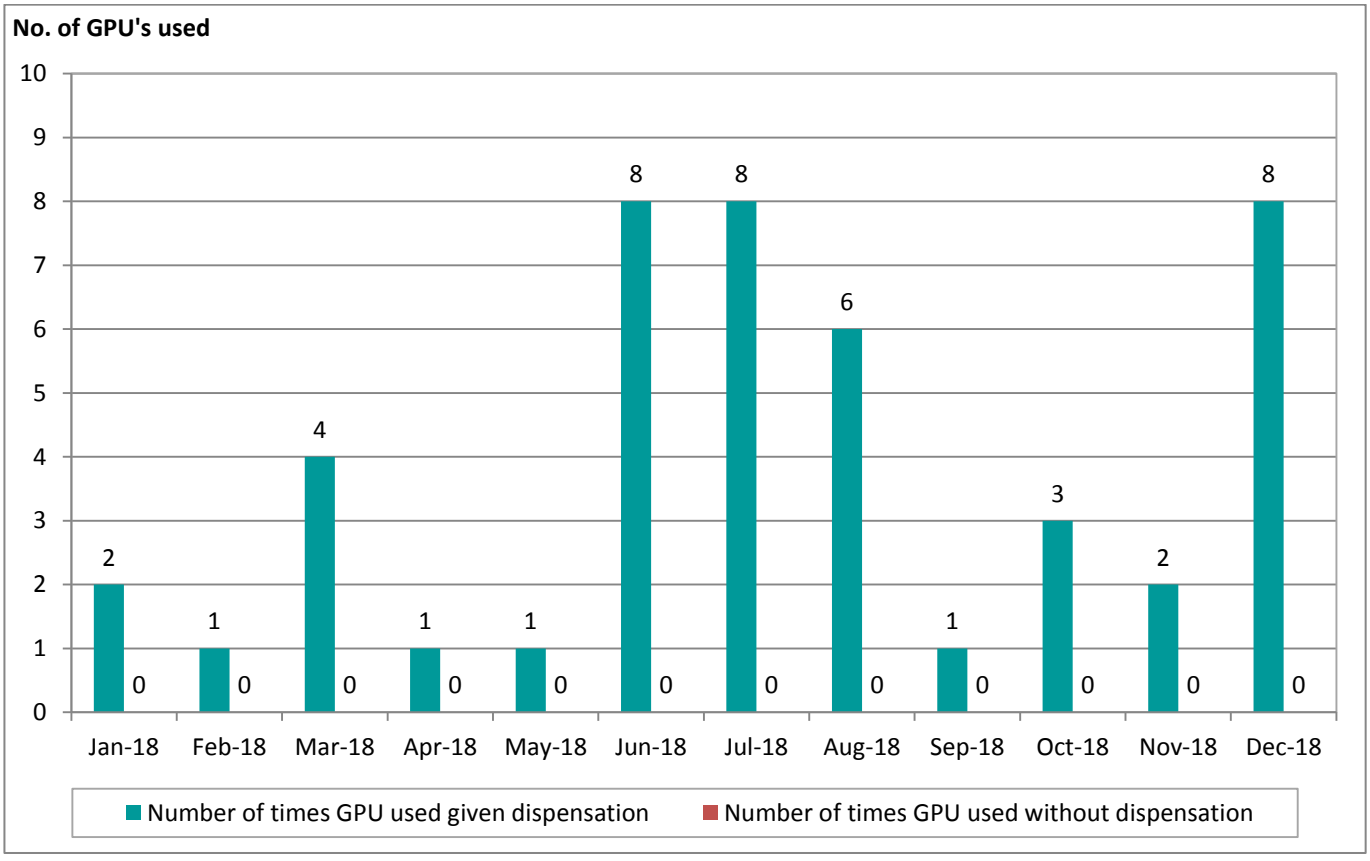


FIGURE 19 - THE USE OF GROUND POWER UNITS IN 2018



Arriving Aircraft

Unlike take-off, where the majority of the noise is generated by an aircraft's engines, noise generated by arriving aircraft is a product of both airframe and engine noise. Airframe noise is produced by the airflow passing over the wings, flaps, and slats also by the aircraft undercarriage.

Although there are no set routes for arriving aircraft, there are long established procedures to mitigate the disturbance that they can cause on approach to the airfield. One of the most successful measures is a noise mitigation procedure called Continuous Descent Operations (CDO).

Aircraft engines produce more noise during level flight than in a shallow glide, possible with CDO, also by avoiding steep changes in height, this reduces airframe noise considerably.

In simple terms, CDO keeps aircraft higher for longer and reduces periods of prolonged level flight at lower altitudes. As CDO is dependent on factors outside of the pilot's control, such as weather, traffic levels and track miles provided by ATC, it is not compulsory.

Gatwick Airport has one of the highest CDO achievement rates in Europe, especially during the sensitive night time period.

There have been instances where the standby runway is utilised during the night period and this can have a negative effect on CDO performance due to the different arrival procedures involved. In addition to the noise benefit, the use of CDO techniques also reduces fuel burn and hence CO_2 and NO_x emissions, thereby producing an environmental benefit.

*Due to two separate radar outages to the Casper flight tracking system which occurred between the 11th and 12th July 2018 and between 10th and 13th August 2018 inclusive, data has been omitted from the statistics for these dates.

Figure 20 compares the level of CDO performance by our airline operators for 2018, with our top operators by aircraft movements having above average levels of achievement.

FIGURE 20 – TOP 40 CDO PERFORMANCE BY AIRLINE 2018

**Ad-hoc/signature flights comprises of movements that are not flown often and low CDO performance which could be due to limited pilot knowledge of procedures.

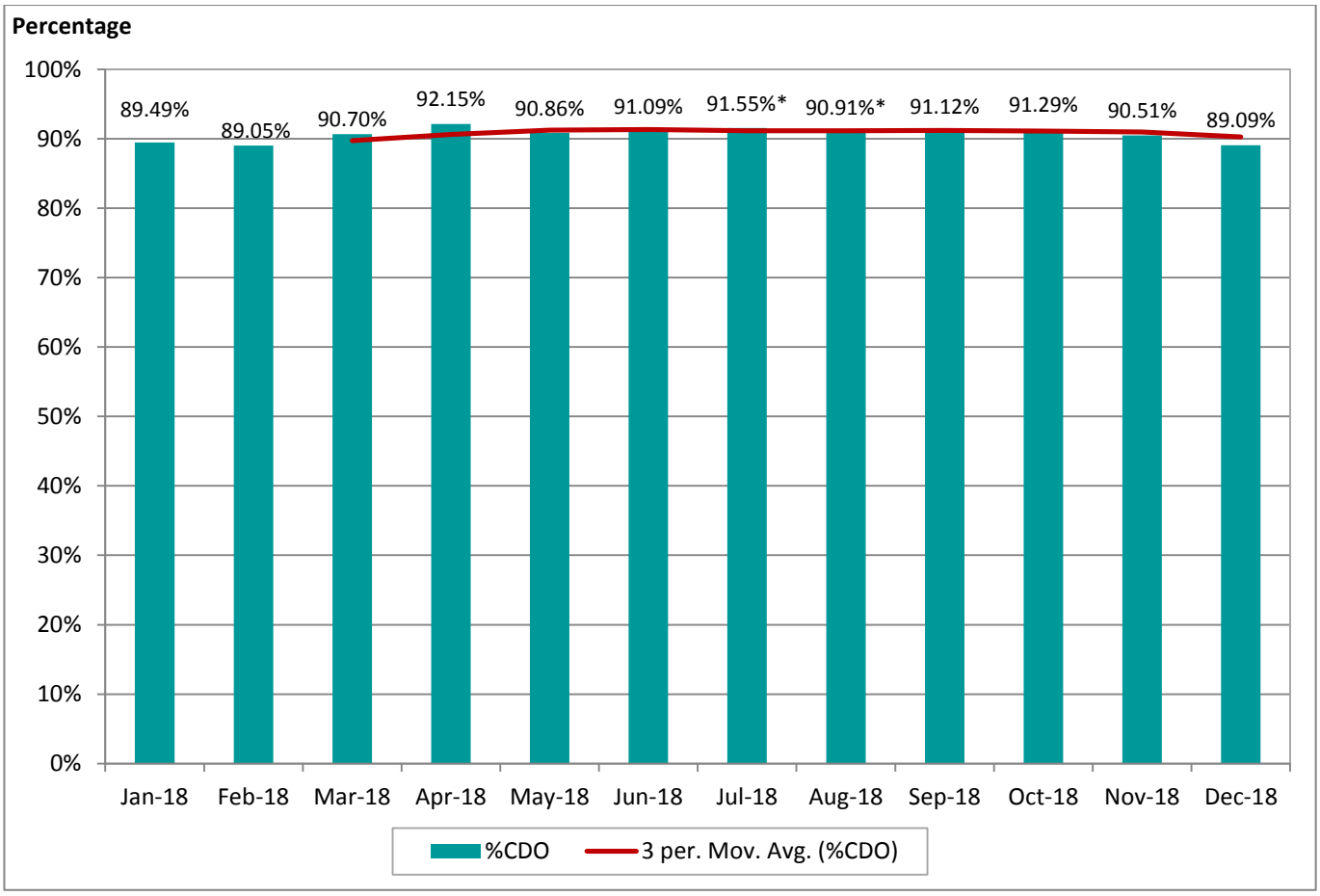
Airline	Arrivals	CDO Performance
EasyJet	61,263	95.17%
British Airways	24,859	92.63%
Norwegian	15,658	91.07%
TUI	6,084	94.81%
Thomas Cook Airlines	4,199	93.67%
Vueling Airlines	4,155	79.45%
Ryanair	3,617	98.29%
Aer Lingus	2,227	86.57%
Virgin Atlantic	2,091	92.64%
Aurigny	2,034	95.33%
TAP Air Portugal	1,280	69.53%
Emirates	1,095	79.45%
Turkish Airlines	1,054	70.02%
Flybe	948	92.62%
WestJet Airlines	937	76.63%
Air Europa	735	65.03%
Iberia Express	722	61.08%
Air Baltic	713	75.60%
Ukraine Intl. Airlines	684	62.13%
Air Transat	666	82.73%
WOW Air	645	83.88%
Qatar Airways	487	75.77%
Ad-hoc/Signature flights**	381	39.37%
Icelandair	379	82.85%
Air Malta	356	85.11%
Wizz Air	335	75.22%
Cathay Pacific	334	77.54%
Royal Air Maroc	330	73.03%
Cobalt Air	308	76.30%
Air Arabia Maroc	297	45.79%
Rossiya Airlines	282	42.55%
Level Airlines	268	48.88%
Titan Airways	266	95.49%
Enter Air	245	56.73%
China Airlines	237	41.35%
Travel Service Airlines	192	62.50%
Belavia	174	39.08%
Rwandair	160	77.50%
Tunisair	148	29.73%
Georgian Airways	118	64.41%

24 HOUR CDO ACHIEVEMENT

FIGURE 21 – THE SUMMARY OF CDO ACHIEVEMENT FOR THE 24 HOUR PERIOD IN 2018

	All Arrivals			08 Easterly Arrivals			26 Westerly Arrivals		
Month	Total	Non CDO	% CDO	Total	Non CDO	% CDO	Total	Non CDO	% CDO
Jan-18	9,555	1,004	89.49%	2,402	230	90.42%	7,153	774	89.18%
Feb-18	9,579	1,049	89.05%	4,286	474	88.94%	5,293	575	89.14%
Mar-18	11,050	1,028	90.70%	5,080	497	90.22%	5,970	531	91.11%
Apr-18	11,737	921	92.15%	4,646	335	92.79%	7,091	586	91.74%
May-18	12,774	1,168	90.86%	7,954	767	90.36%	4,820	401	91.68%
Jun-18	13,315	1,187	91.09%	6,986	605	91.34%	6,329	582	90.80%
Jul-18*	13,051	1,103	91.55%	4,053	331	91.83%	8,998	772	91.42%
Aug-18*	12,275	1,116	90.91%	1,445	137	90.52%	10,830	979	90.96%
Sep-18	13,472	1,196	91.12%	3,990	375	90.60%	9,482	821	91.34%
Oct-18	12,556	1,094	91.29%	4,519	407	90.99%	8,037	687	91.45%
Nov-18	9,669	918	90.51%	4,776	416	91.29%	4,893	502	89.74%
Dec-18	10,207	1,114	89.09%	2,421	231	90.46%	7,786	883	88.66%

FIGURE 22 – CDO ACHIEVEMENT DURING THE 24 HOUR PERIOD PER MONTH WITH A TRENDLINE

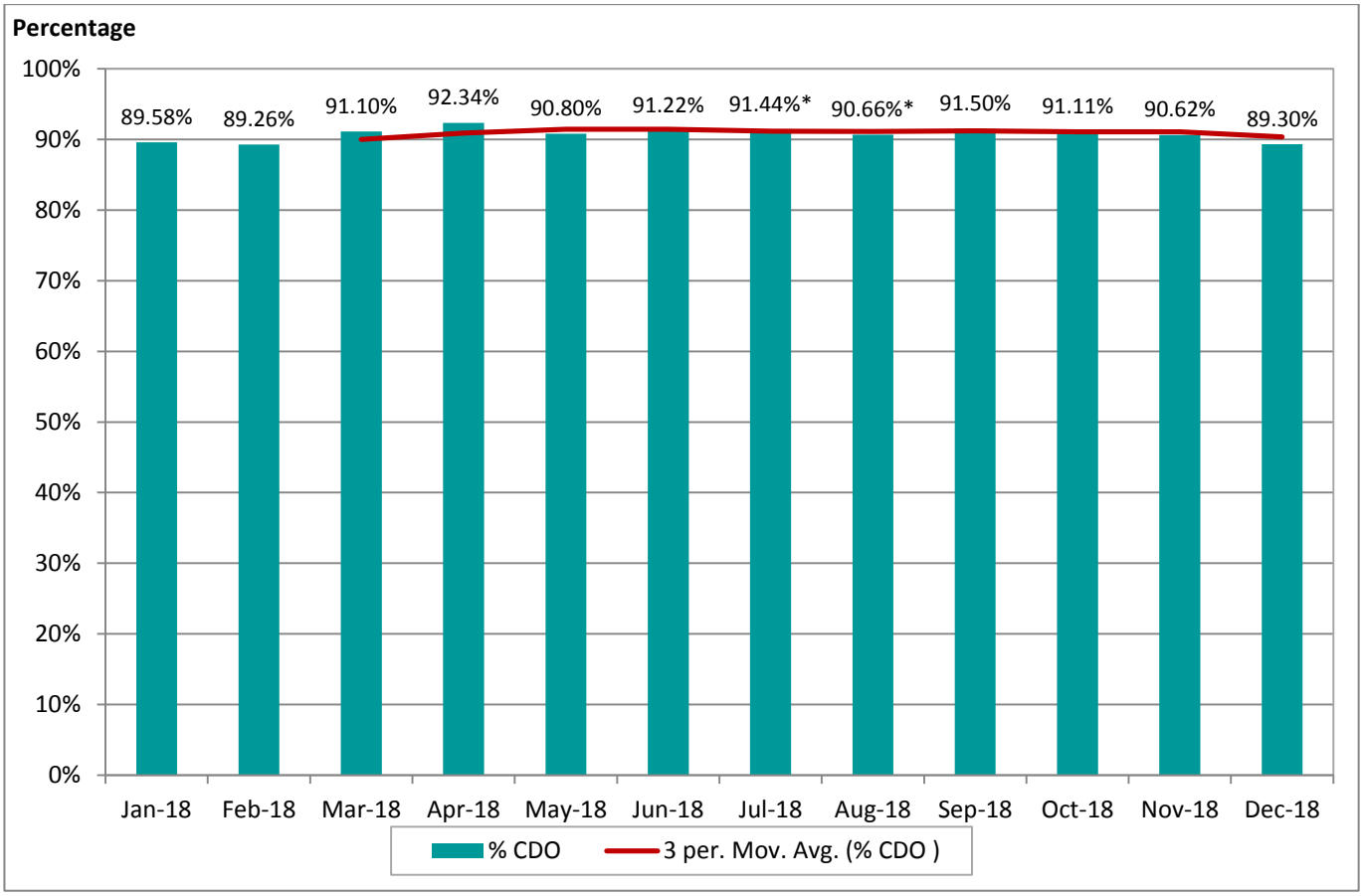


DAYTIME AND SHOULDER PERIOD CDO ACHIEVEMENT (0600-2330)

FIGURE 23 - THE SUMMARY OF CDO ACHIEVEMENT FOR THE DAYTIME AND SHOULDER PERIOD IN 2018

	All Arrivals			08 Easterly Arrivals			26 Westerly Arrivals		
Month	Total	Non CDO	% CDO	Total	Non CDO	% CDO	Total	Non CDO	% CDO
Jan-18	9,264	965	89.58%	2,311	219	90.52%	6,953	746	89.27%
Feb-18	9,279	997	89.26%	4,136	453	89.05%	5,143	544	89.42%
Mar-18	10,503	935	91.10%	4,826	461	90.45%	5,677	474	91.65%
Apr-18	10,847	831	92.34%	4,221	312	92.61%	6,626	519	92.17%
May-18	11,443	1,053	90.80%	7,113	407	94.28%	4,330	346	92.01%
Jun-18	11,648	1,023	91.22%	6,042	542	91.03%	5,606	481	91.42%
Jul-18*	11,296	967	91.44%	3,551	286	91.95%	7,745	681	91.21%
Aug-18*	10,714	1,001	90.66%	1,272	129	89.86%	9,442	872	90.76%
Sep-18	11,903	1,012	91.50%	3,464	324	90.65%	8,439	688	91.85%
Oct-18	11,434	1,017	91.11%	4,103	382	90.69%	7,331	635	91.34%
Nov-18	9,340	876	90.62%	4,591	393	91.44%	4,749	483	89.83%
Dec-18	9,770	1,045	89.30%	2,304	216	90.63%	7,466	829	88.90%

FIGURE 24 - CDO ACHIEVEMENT DURING THE DAYTIME AND SHOULDER PERIOD PER MONTH WITH A TRENDLINE

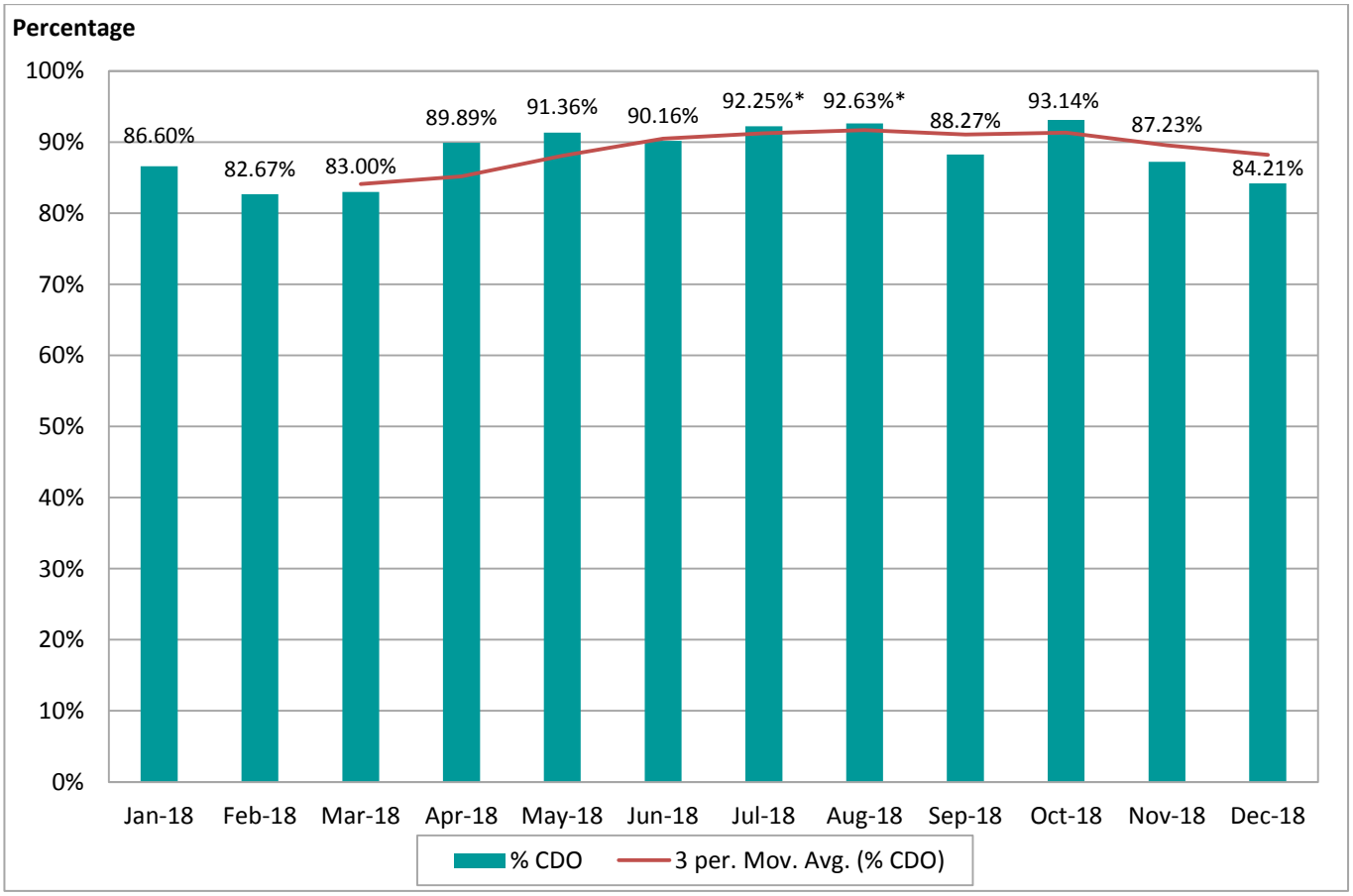


CORE NIGHT CDO ACHIEVEMENT (2330-0600)

FIGURE 25 - THE SUMMARY OF CDO ACHIEVEMENT FOR THE CORE NIGHT PERIOD IN 2018

Month	All Arrivals			08 Easterly Arrivals			26 Westerly Arrivals		
	Total	Non CDO	% CDO	Total	Non CDO	% CDO	Total	Non CDO	% CDO
Jan-18	291	39	86.60%	91	11	87.91%	200	28	86.00%
Feb-18	300	52	82.67%	150	21	86.00%	150	31	79.33%
Mar-18	547	93	83.00%	254	36	85.83%	293	57	80.55%
Apr-18	890	90	89.89%	425	23	94.59%	465	67	85.59%
May-18	1,331	115	91.36%	841	60	92.87%	490	55	88.78%
Jun-18	1,667	164	90.16%	945	63	93.33%	722	101	86.01%
Jul-18*	1,755	136	92.25%	502	45	91.04%	1,253	91	92.74%
Aug-18*	1,561	115	92.63%	173	8	95.38%	1,388	107	92.29%
Sep-18	1,569	184	88.27%	526	51	90.30%	1,043	133	87.25%
Oct-18	1,122	77	93.14%	416	25	93.99%	706	52	92.63%
Nov-18	329	42	87.23%	185	23	87.57%	144	19	86.81%
Dec-18	437	69	84.21%	117	15	87.18%	320	54	83.13%

FIGURE 26 - CDO ACHIEVEMENT DURING THE CORE NIGHT PERIOD PER MONTH WITH A TRENDLINE



Operations at Night

NIGHT-TIME JOINING POINT

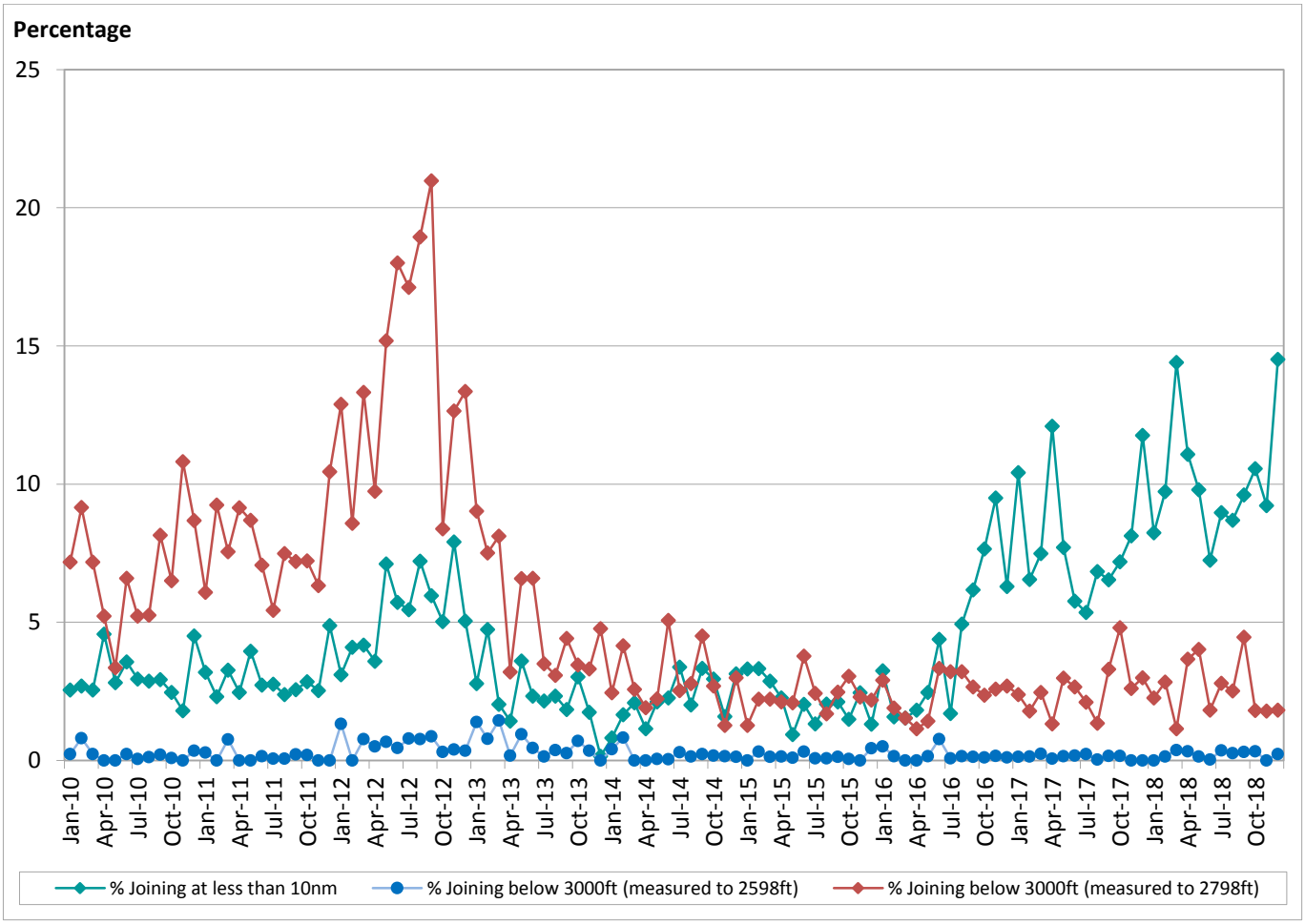
There are also rules that instruct arriving aircraft to avoid the overflight of some nearby towns, below 3,000 feet, thus mitigating the noise impact over these built up areas.

There is also a specific rule regarding restricting aircraft to at least 2,000 feet as they pass the town of Lingfield, which is under the final approach path.

For some people, it is night flights that cause the most disturbance and therefore, in order to mitigate the impact of arriving aircraft, there are a number of rules that apply during the night period designed to keep aircraft as high as possible for as long as possible. These relate to the height and distance at which they can join the centreline for final approach, or Instrument Landing System (ILS). Collectively, these minimum heights and distances are known as the joining point criteria.

*Due to two separate radar outages to the Casper flight tracking system which occurred between the 11th and 12th July 2018 and between 10th and 13th August 2018 inclusive, data has been omitted from the statistics for these dates.

FIGURE 27 - THE NIGHT TIME JOINING POINTS (2010 – 2018)



N.B. 3,000ft (Gatwick QNH) – 202ft (airfield elevation) = 2,798ft on Airports Noise & Track Keeping System
3,000ft (Gatwick QNH) – 202ft (airfield elevation) – 200ft ATC radar tolerance = 2,598ft on Airports Noise & Track Keeping System

Night Flights

Night flights are classified as those which take off and land between 23:00 and 07:00, when restrictions on the types of aircraft can operate come in to force. Further restrictions apply during the core night period (between 23:30 and 06:00) when there is a limit on the number of flights that can operate. This is supplemented by a noise quota system designed to encourage the use of quieter types during the night.

The latest restrictions on night flying came into force in October 2017, to remain in force until 2022 for all the London airports. At Gatwick, the new regime will maintain the status quo for movements and quota count (QC) until the winter season in 2018/19. This season saw a reduction in the QC limit and a new QC value of 0.125 applied to some aircraft which were classified as exempt. As of October 2017, all aircraft movements have counted towards the night quota limit, including those previously exempt. This will further incentivise the use of quieter aircraft as an airport can continue the use of its movement allowance but the average noise produced by an aircraft cannot increase.

The noise quota of an individual aircraft is based on its official noise certification data, with separate classifications for take-off and landing in the form of QC values. **Figure 28** shows the different QC categories. In general terms, the smaller or newer the aircraft, the lower its QC value will be. For each aircraft type, the departure QC value tends to be higher than that for arrivals.

FIGURE 28 - THE CLASSIFICATION OF QC VALUES

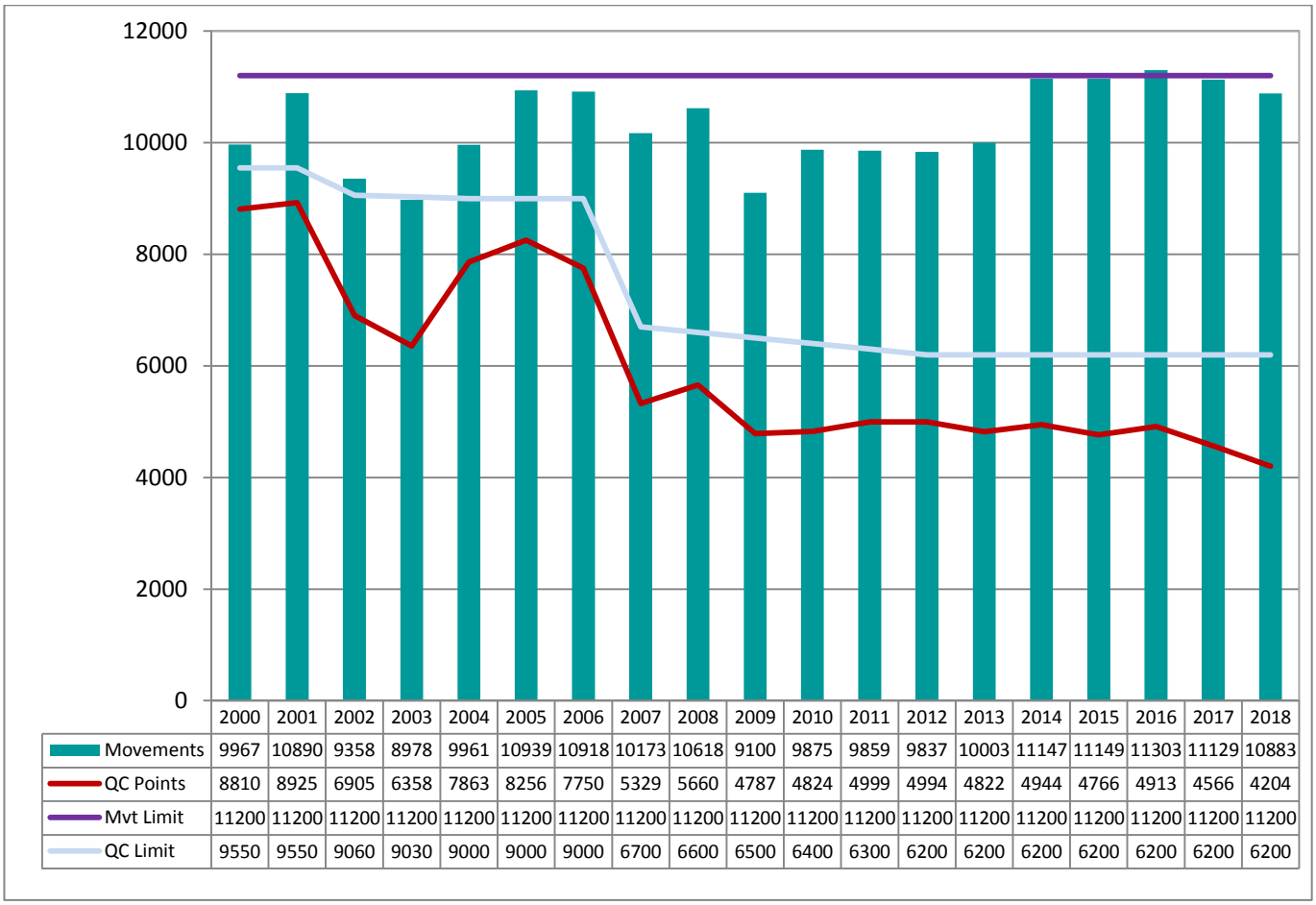
Certificated noise level (EPNdB)	Quota count
Less than 81	0
81 to 83.9	0.125
84 to 86.9	0.25
87 to 89.9	0.5
90 to 92.9	1
93 to 95.9	2
96 to 98.9	4
99 to 101.9	8
Greater than 101.9	16

FIGURE 29 - THE MOVEMENT AND QC LIMITS FOR THE NIGHT PERIOD

Winter	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Movements Limits	3250	3250	3250	3250	3250	3250
Quota Points	2000	2000	1785	1785	1785	1785

Summer	2017	2018	2019	2020	2021	2022
Movements Limits	11200	11200	11200	11200	11200	11200
Quota Points	6200	6200	5150	5150	5150	5150

FIGURE 30 – A SUMMARY OF NIGHT QUOTA QC AND MOVEMENT USAGE FOR THE SUMMER SEASON 2000-2018



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Movements	9967	10890	9358	8978	9961	10939	10918	10173	10618	9100	9875	9859	9837	10003	11147	11149	11303	11129	10883
QC Points	8810	8925	6905	6358	7863	8256	7750	5329	5660	4787	4824	4999	4994	4822	4944	4766	4913	4566	4204
Mvt Limit	11200	11200	11200	11200	11200	11200	11200	11200	11200	11200	11200	11200	11200	11200	11200	11200	11200	11200	11200
QC Limit	9550	9550	9060	9030	9000	9000	9000	6700	6600	6500	6400	6300	6200	6200	6200	6200	6200	6200	6200

SEASON FLEXIBILITY

The night flight restrictions allow a carry-over facility to provide flexibility between seasons. Any unused allowance (up to 10% of the total allowance) from a preceding season can be carried over to next to allow some additional usage.

Under the current restrictions, the loudest aircraft types with a QC classification of QC8 or QC16 are not allowed to operate during the night quota period. Although aircraft with a value of QC4 are allowed to operate, they cannot be scheduled during the night period, therefore those that do take off or land are late departures or early arrivals.

Due to Gatwick's strict scheduling rules, there were no QC4 aircraft which operated during this period in the summer season.

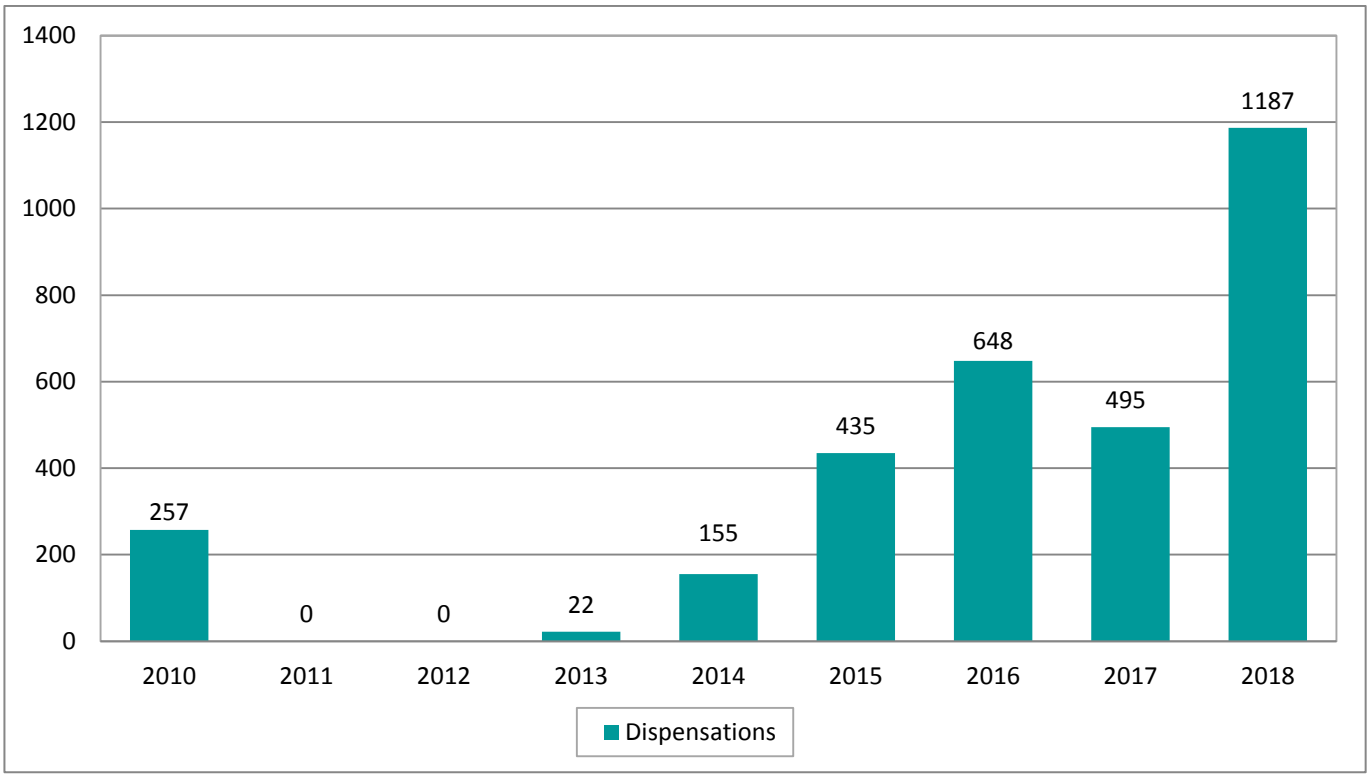
Aircraft with a QC0 classification are now counted as movements as of the winter season 2018/19. Examples of this aircraft type are some small executive jets and small propeller aircraft. Very few aircraft fall under this category at Gatwick. There is also an additional QC0.125 category that has been introduced to categorise aircraft that were previously exempt and new generation aircraft such as the Airbus A320 Neo.

DISPENSATIONS

Aircraft can also be granted a dispensation to operate during the night quota period in exceptional circumstances, based on DfT guidelines. Examples of such circumstances are:

- Medical emergencies
- Humanitarian flights
- Aircraft carrying heads of state or royal families
- To alleviate terminal overcrowding/situations where significant distress may be caused to humans or animals.
- Non-scheduled movements as a result of major Air Traffic disruption.

FIGURE 31 – THE NUMBER OF DISPENSATIONS GRANTED (2010 – 2018)



REASONS FOR DISPENSATIONS 2018

FIGURE 32 – A SUMMARY OF THE REASONS FOR GIVEN DISPENSATIONS DURING 2018

Reason	Frequency
Disruption due to adverse weather conditions	698
ATC capacity issues	237
ATC strike action	101
Runway closure due to drone activity in December 2018	80
Emergencies	34
EXCDS	31
ATM System Failure	6

FIGURE 33 - THE QUOTA COUNT USED DURING THE SUMMER SEASON 2004 - 2018

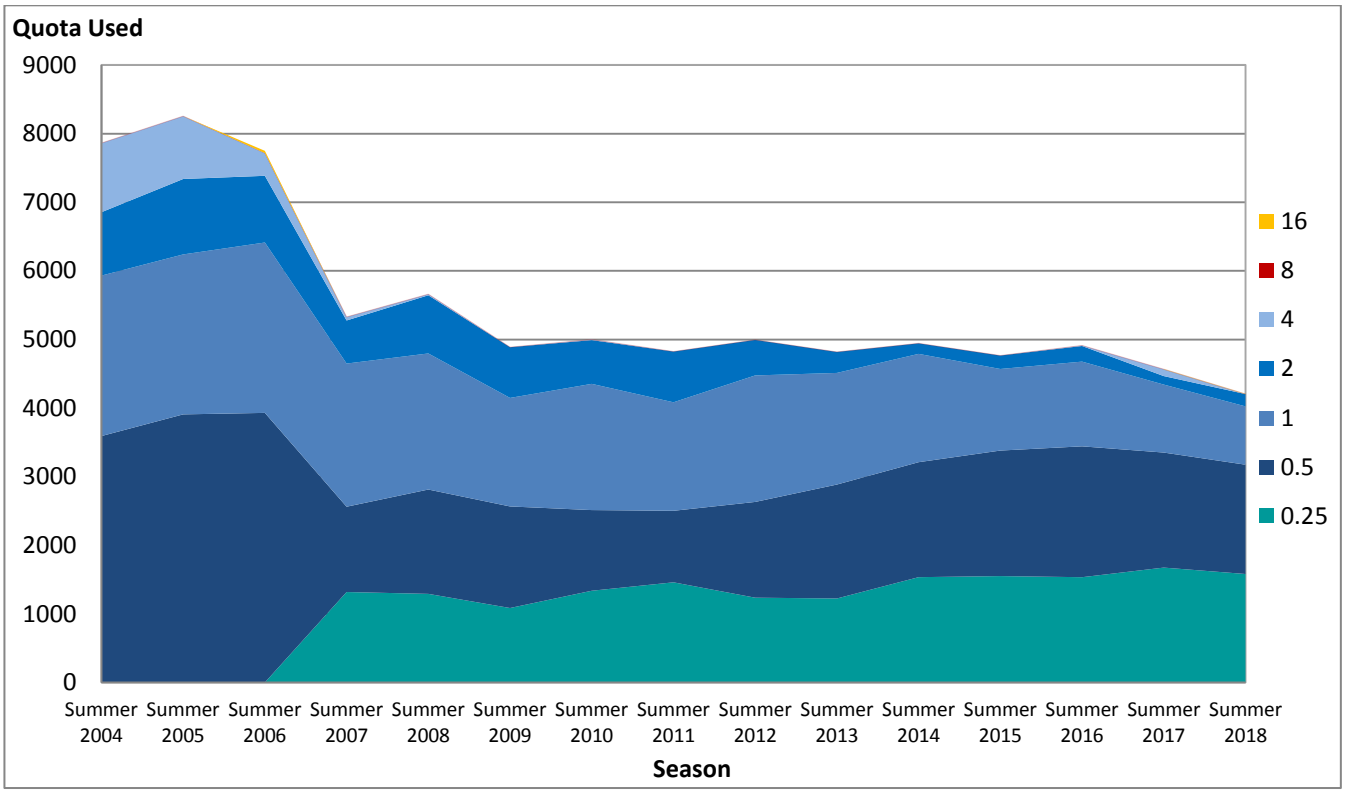
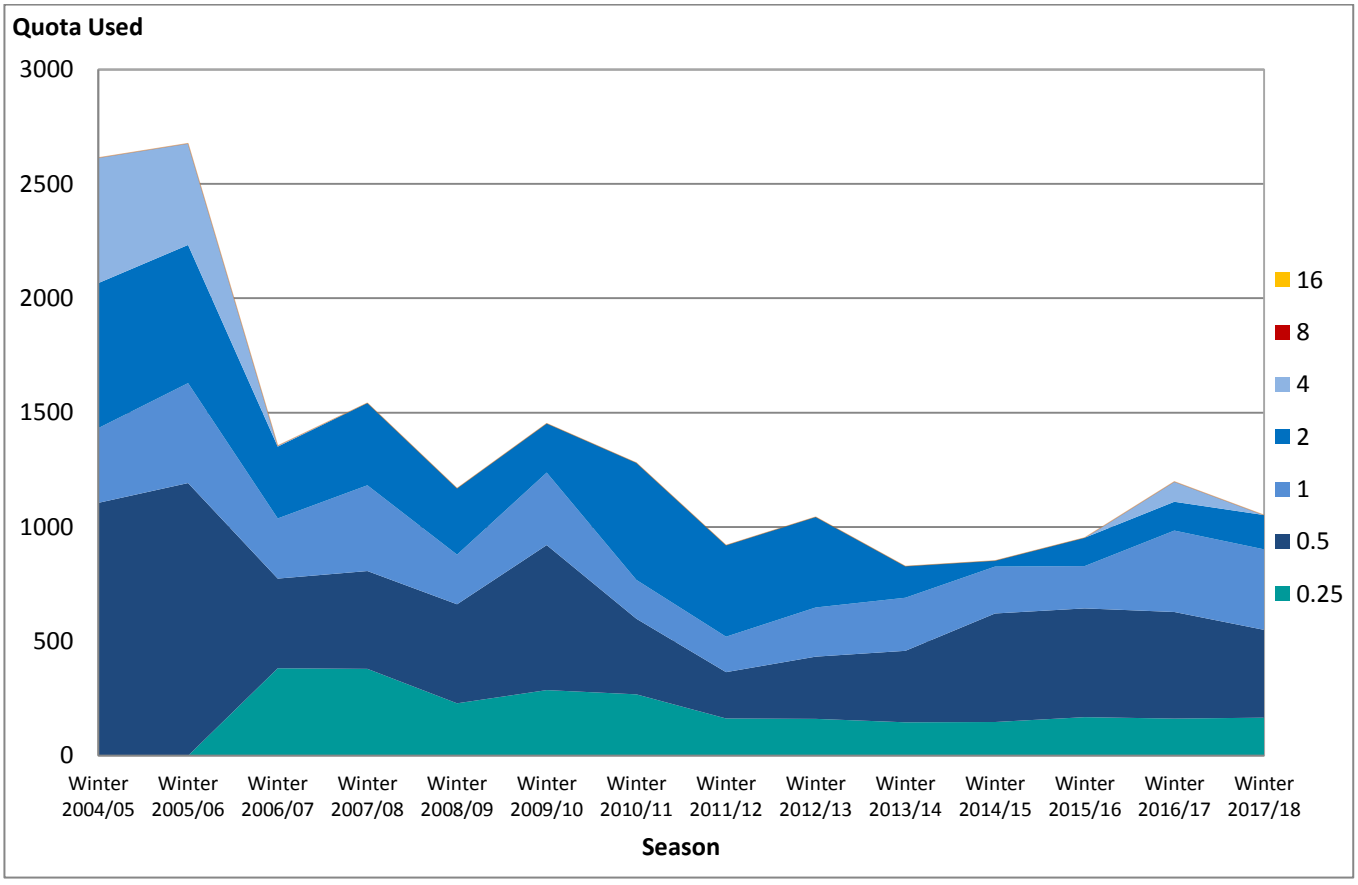


FIGURE 34 - THE QUOTA COUNT USED DURING THE WINTER SEASON 2004/5 – 2017/18



Aircraft Noise and Community Noise Monitoring

Aircraft noise is assessed in three different ways:

1. Departure Noise Limits (e.g. noise infringements)
2. Local community noise studies
3. Annual Noise Contours (commissioned by the Airport, published by the Environmental Research Consultancy Department).

DEPARTURE NOISE LIMITS

Departure noise limits are based on the assumption that the noise monitors are exactly 6.5km from the start of roll point on the runway and at the same elevation as the airfield. In practice, this is seldom possible and adjustments are made to the limits to account for any variances in the monitor position. There is also a margin of error taken into account for the microphone of +/- 0.7dB. Details of the limits that apply to departing aircraft are shown below.

In light of the more noise sensitive period, a lower noise limit applies during the night-time hours, which restricts the types of aircraft that can operate during this time.

FIGURE 35 - THE NOISE LIMITS AS ADJUSTED FOR INDIVIDUAL MONITORING SITES

Site	Adjustments specific to monitoring sites			Adjusted Limit values at monitoring sites		
	Positional	Equipment	Total	Day	Shoulder	Night
1	+5.0	+0.7	+5.7	99.7	94.7	92.7
3	+1.9	+0.7	+2.6	96.6	91.6	89.6
5	+1.9	+0.7	+2.6	96.6	91.6	89.6
4	0.0	+0.7	+0.7	94.7	89.7	87.7
6	-0.2	+0.7	+0.5	94.5	89.5	87.5

NOISE PENALTIES

Financial penalties are applied to aircraft that exceed the noise monitor levels on departure (monitored at 6.5km from the start of roll).

A minimum penalty of £500 will be applied for any departing flight that exceeds the above noise limits. For any departure that exceeds the limit by 3 decibels or more, a fine of £1,000 is applied.

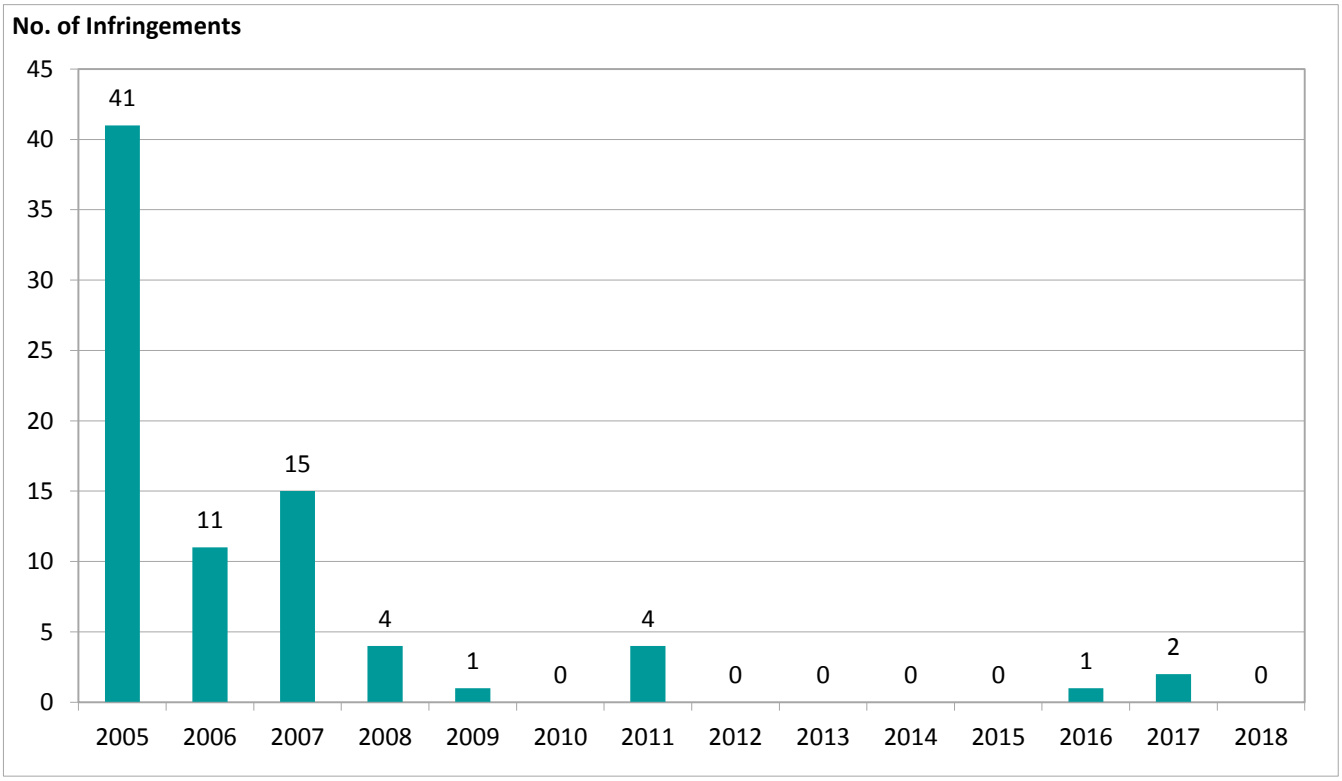
All proceeds from noise fines are passed to the independently run Gatwick Airport Community Trust (GACT). The trust also receives over £200,000 per annum from the Airport and distributes grants to local charities and community projects.

Details of the work carried out by the GACT are available at **www.gact.org.uk**

During 2018, there were no departure noise infringements observed.

Gatwick is continuing to work with our airline partners to encourage the best practice in noise management and the continuing introduction of more modern types operating at the Airport in recent years, including the Boeing 737 MAX 8 and A320/A321 Neo family of aircraft.

FIGURE 36 - THE GRAPH BELOW SHOWS THE DEPARTURE NOISE INFRINGEMENTS PER YEAR 2005 – 2018



NOISE CONTOURS

In the UK, originally Government research indicated that people start being concerned by aircraft noise at 57dB averaged over 16 hours (57dB LAeq). There has since been a Survey of Noise Attitudes (SONA 2014) that has found the degree of annoyance now occurs at 54dB LAeq.

To show where the different average noise levels are located around the Airport, the Government has developed maps showing noise contours. **Figure 38** shows the noise contour map for the area around Gatwick Airport.

The contours are an irregular shape because typically people experience a greater amount noise at the ends of the runway (where planes take off and land) than along the sides of the runway.

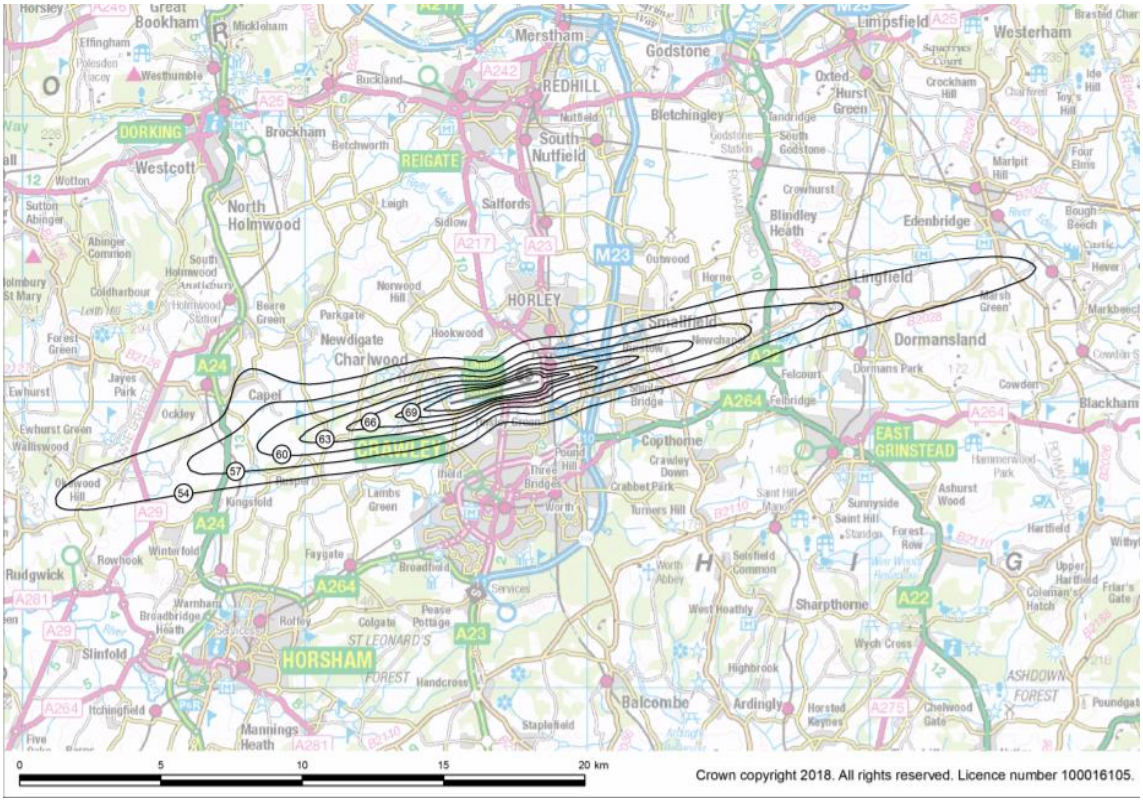
The 57 dBA Leq day contour area for 2017 based on the day standard runway modal split was calculated to be 42.6km^2, 3% lower than in 2016. The population enclosed within the actual 57 dBA Leq day contour did not change.

The 2018 noise contours have not been completed at the time of publication but have been commissioned and due for publication in Spring 2019.

FIGURE 37 - THE GATWICK DAY STANDARD CONTOURS – AREAS AND POPULATIONS FOR 2016 AND 2017

Leq (dBA)	2016 Area (km^2)	2017 Area (km^2)	Area change (%)	2016 Population	2017 Population	Population change (%)
> 57	43.8	42.6	-3%	3,400	3,400	0%
> 60	25.2	24.1	-4%	1,600	1,500	-6%
> 63	13.8	13.4	-3%	550	550	0%
> 66	7.2	7.1	-1%	350	350	0%
> 69	3.7	3.7	0%	150	150	0%
> 72	2.1	2.1	0%	0	150	n/a

FIGURE 38 - THE NOISE EXPOSURE CONTOURS 2017



GATWICK NOISE MONITORING GROUP

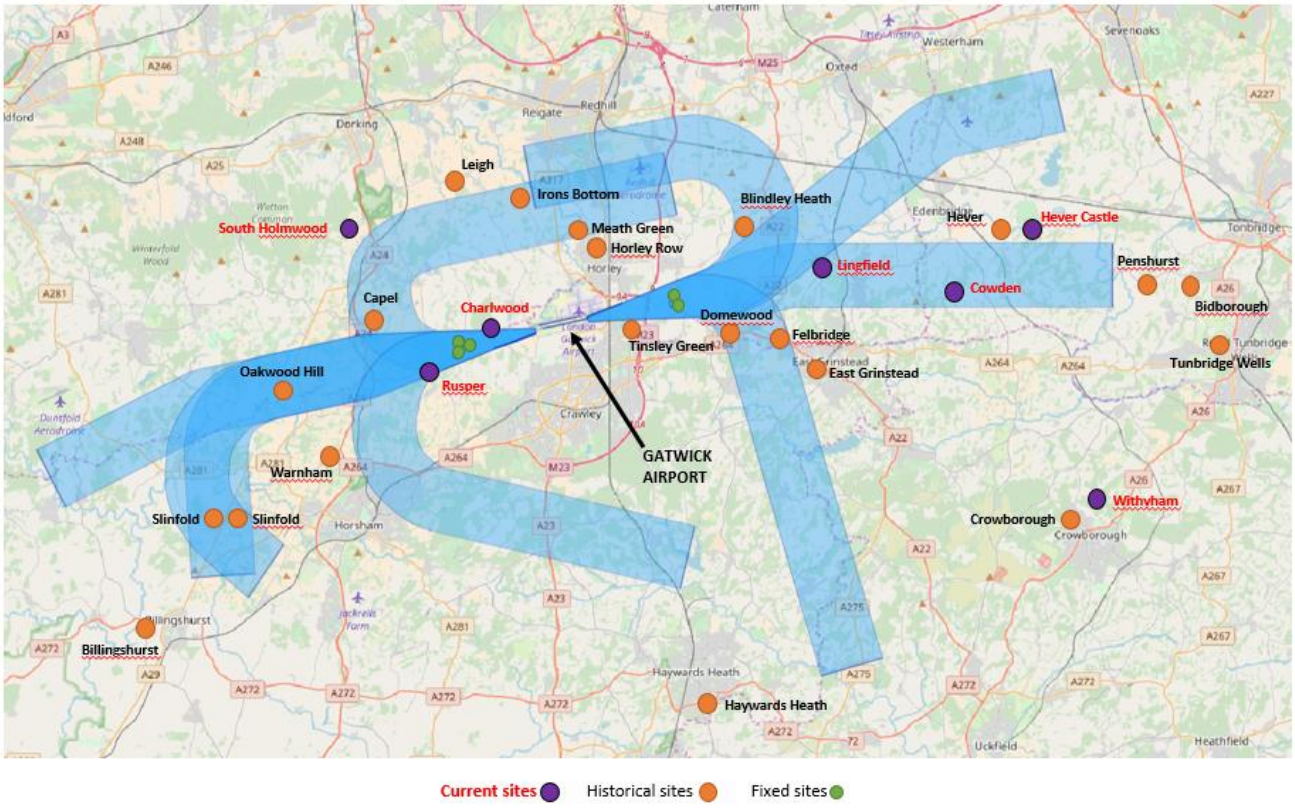
Gatwick Airport funds and co-ordinates a community noise monitoring programme in conjunction with local Environmental Health Officers and the Airport's Consultative Committee. Noise monitors are located throughout local communities in Sussex, Surrey and Kent in order to develop an understanding of the noise environment and assess the impact of aircraft noise on those areas.

Following a study period of 12 months, so as to capture the seasonal differences in aircraft traffic, the Airport instructs an independent noise consultant to produce reports on the noise climate in the study area and these are now available on: **www.gatwickairport.com/noise**

Figure 39 below illustrates the location of current and historical noise monitor sites. The sites cover a large geographic area, therefore benefitting many communities even those that are overflown at relatively high altitudes.

During 2018, a study for the Oakwood Hill noise monitoring terminal was commissioned as the monitor was removed in July 2018. Gatwick will publish this report when it is available.

FIGURE 39 - THE LOCATION OF THE CURRENT AND HISTORICAL NOISE MONITORS



Complaints

The ever-increasing demand for regular and convenient air transportation consequently brings an increase in environmental noise and subsequent effects.

The most widespread and well documented subjective response to noise is annoyance; which can be defined as a feeling of resentment, displeasure, discomfort, dissatisfaction or offence which occurs when noise interferes with thoughts, feelings or activities. The annoyance of populations exposed to environmental noise varies not only with the acoustical characteristics of the noise, but also with a range of non-acoustical factors of social, psychological or economic nature.

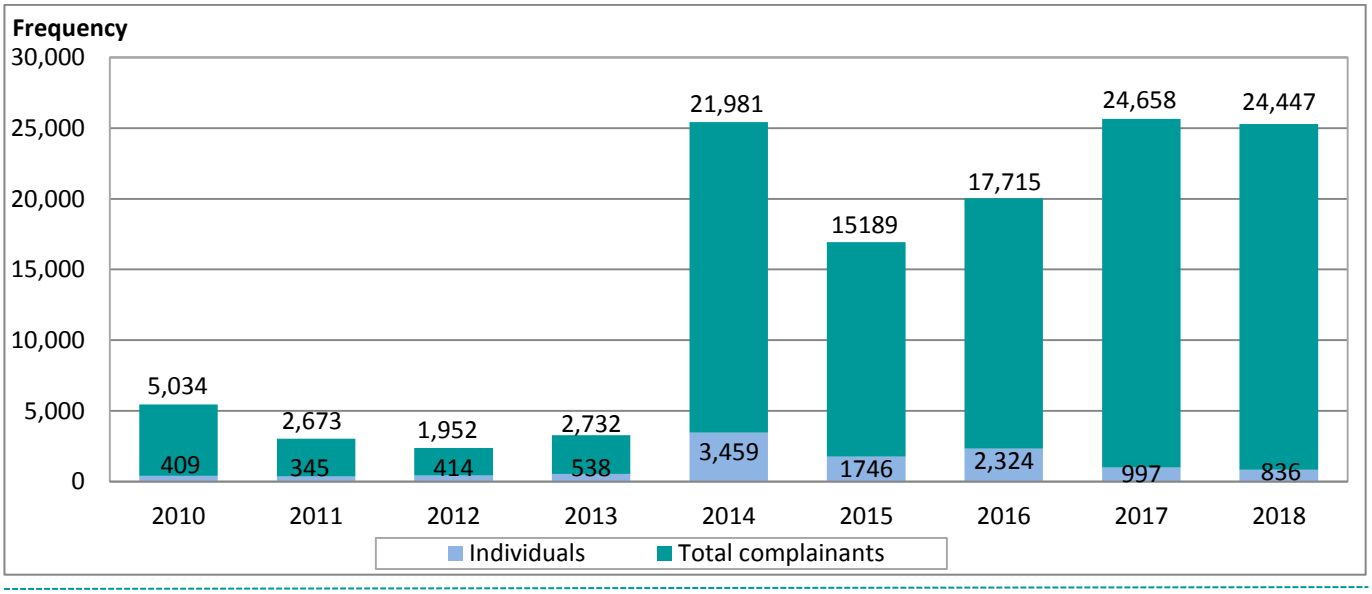
In order to provide public protection from aircraft noise, an 'annoyance threshold' currently exists within UK policy. The time period for noise exposure used is an average summer day, from 16th June to 15th September and from 7am to 11pm to reflect that there is a difference in terms of daytime and night-time noise exposure and consequently, annoyance reactions, resulting in the need for distinctive daytime and night-time noise exposure metrics. The noise exposure metric $L_{Aeq,16h}$, was adopted in 1990 and the UK government defined three thresholds for policy consideration: 57, 63 and 69 dB $L_{Aeq16h,}$ representing low, moderate, and high annoyance levels.

The government published their response to their Airspace Consultation in 2017 and acknowledged that sensitivity to aircraft noise has increased, with the same percentage of people reporting to be highly annoyed at a level of 54 dB $L_{Aeq,16hr}$ as occurred at 57 dB $L_{Aeq,16hr}$ in the past.

Airports bring positive economic and social benefits as well as environmental impacts. They are important to the economy, providing jobs, encouraging inward investment, and boosting local tourism. However, they can also have an impact for those communities that exist around airports. Noise remains a significant issue for people living or working close to airports or under flight paths.

Complaint statistics can be extremely difficult to interpret as a large proportion of all our complaints originate from a small group of individuals. **Figure 40** below shows the number of individual complainants compared to the number of complaints made in previous years. This illustrates one of the difficulties in studying the effects of noise, as people's tolerance of noise and their perception of what causes annoyance varies widely. It is highly subjective and differs not only between neighbours, but also between socio-economic groups. The last study on the effects of aviation noise was the World Health Organisation Environmental Noise Guidelines for the European Region (2018).

FIGURE 40 - THE NUMBER OF INDIVIDUAL COMPLAINANTS AND RECORDED COMPLAINT NUMBERS



COMPLAINANT LOCATIONS

FIGURE 41 – DENSITY MAP OF MOVEMENTS WITH LOCATIONS OF COMPLAINTS RECORDED IN 2018

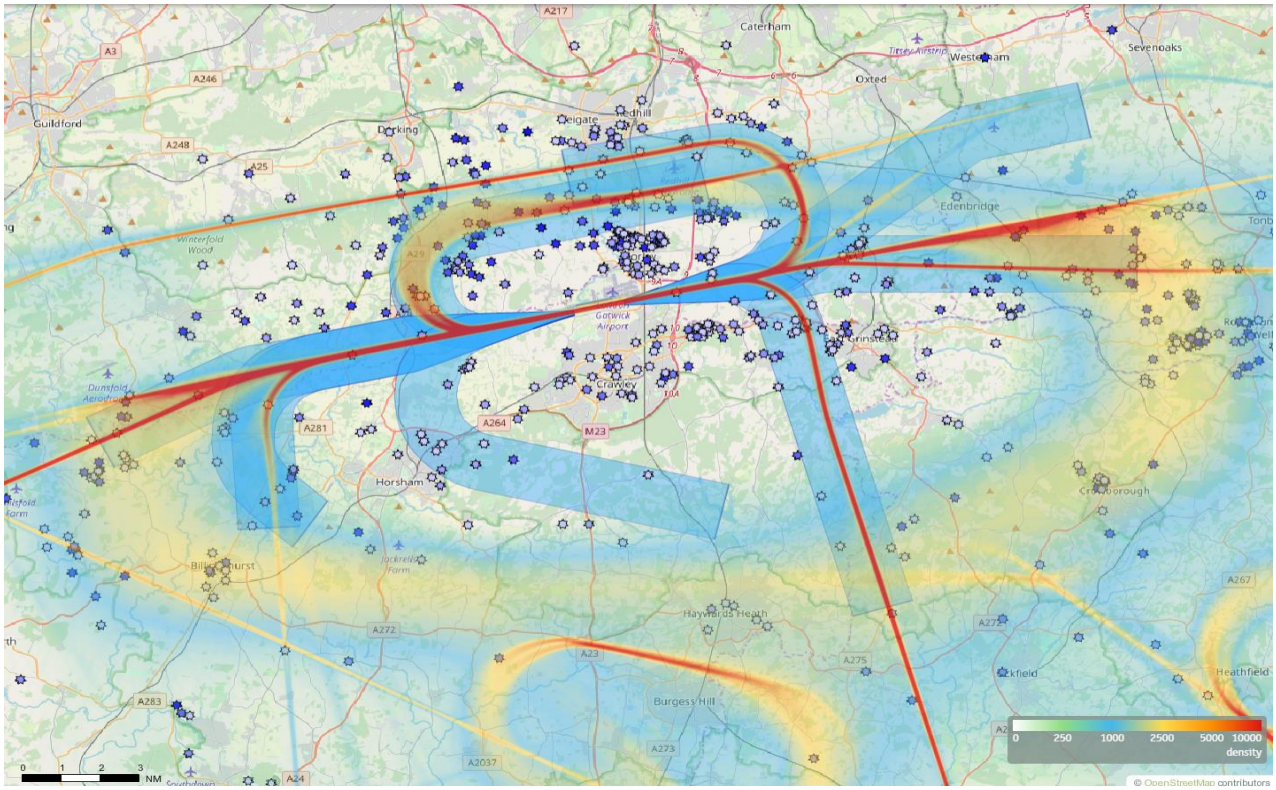


FIGURE 42 – DENSITY MAP OF MOVEMENTS WITH LOCATIONS OF GATWICK NOISE COMPLAINTS RECORDED ACROSS THE SOUTH EAST IN 2018

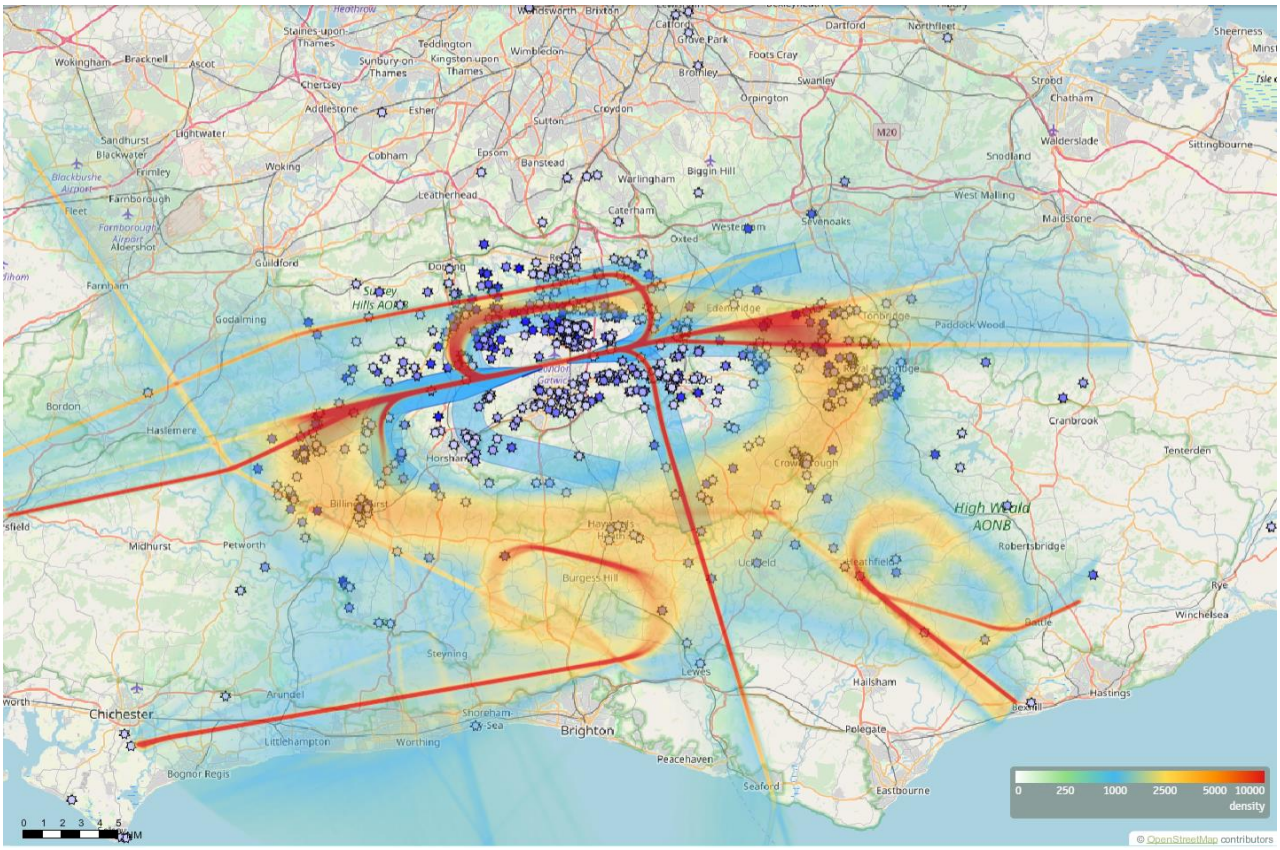


FIGURE 43 – DENSITY MAP OF MOVEMENTS WITH LOCATION OF COMPLAINTS RECORDED FROM COMMUNITIES TO THE WEST

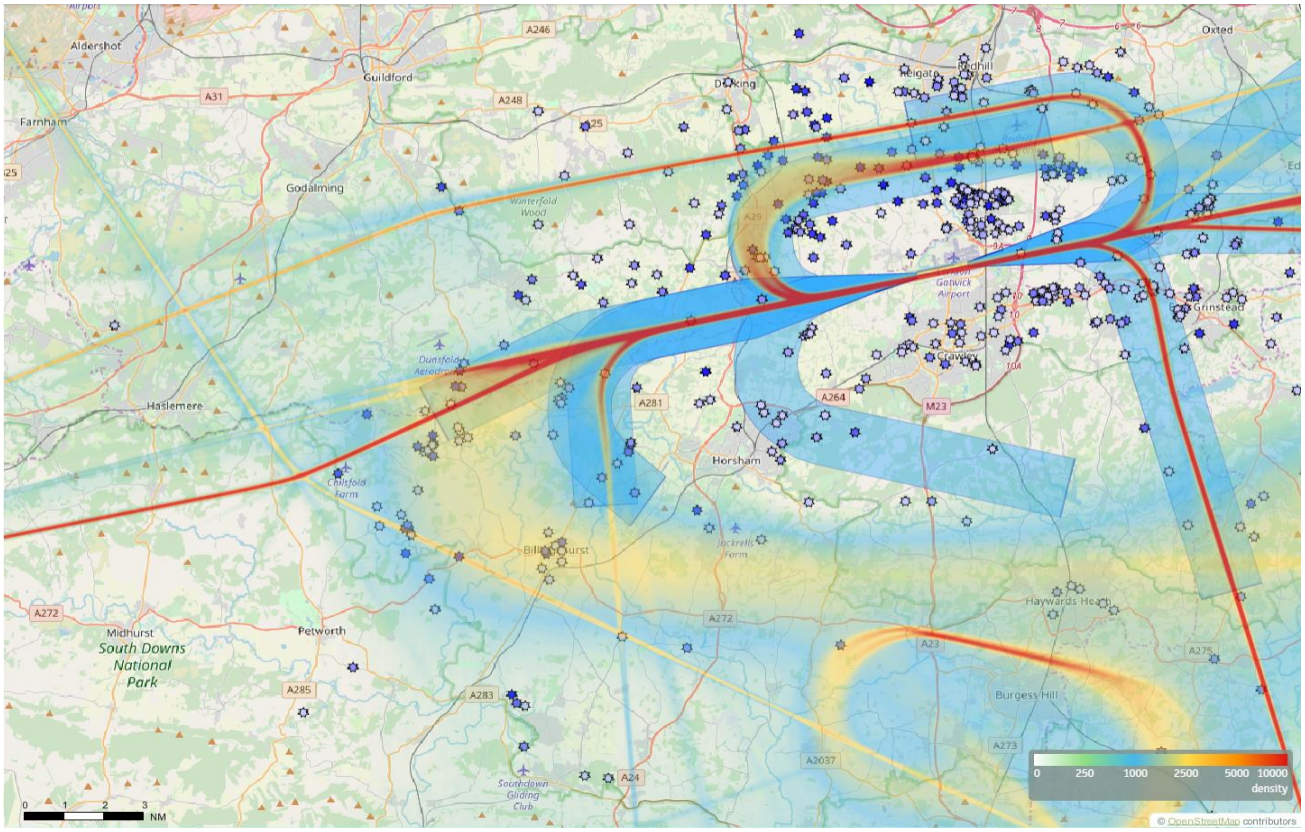


FIGURE 44 - DENSITY MAP OF MOVEMENTS WITH LOCATIONS OF COMPLAINTS RECORDED FROM COMMUNITIES TO THE EAST

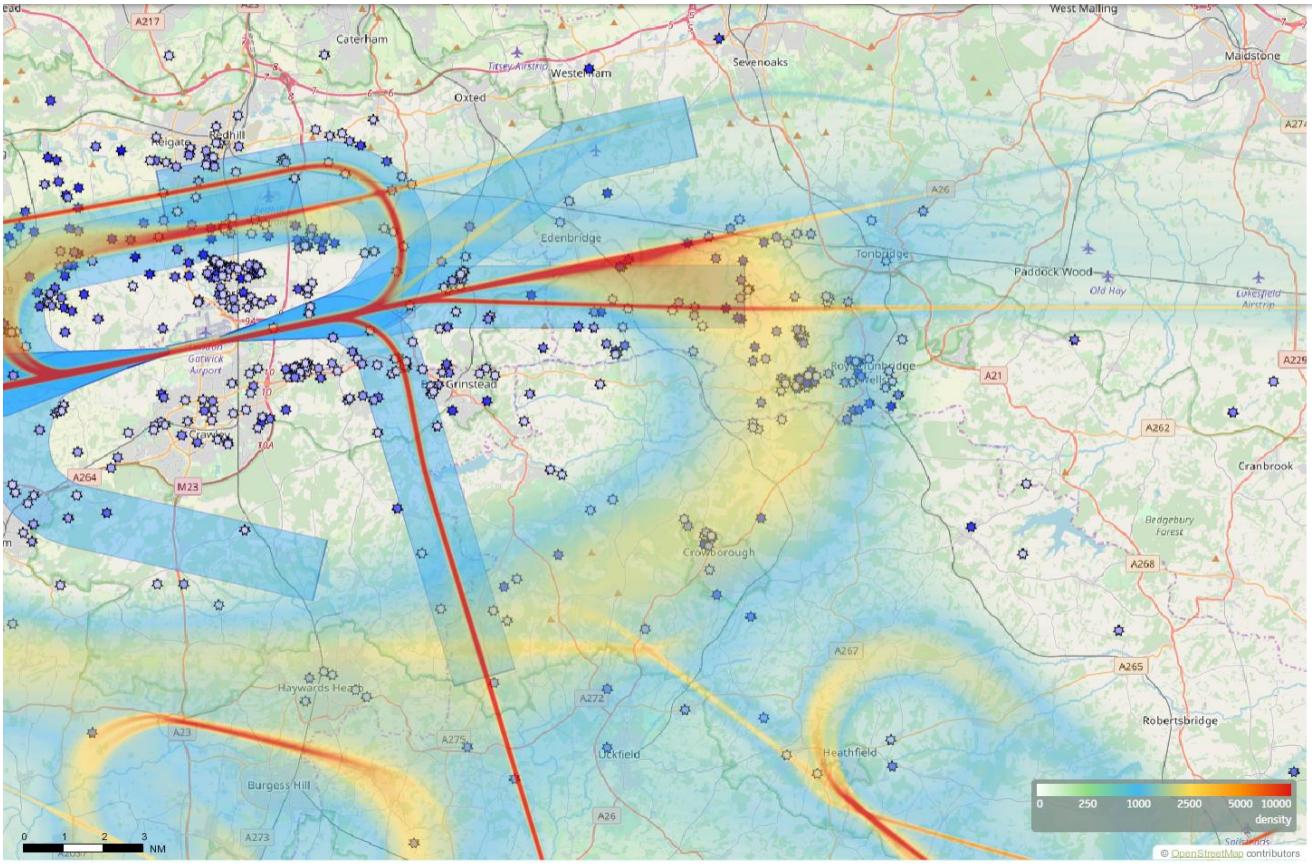
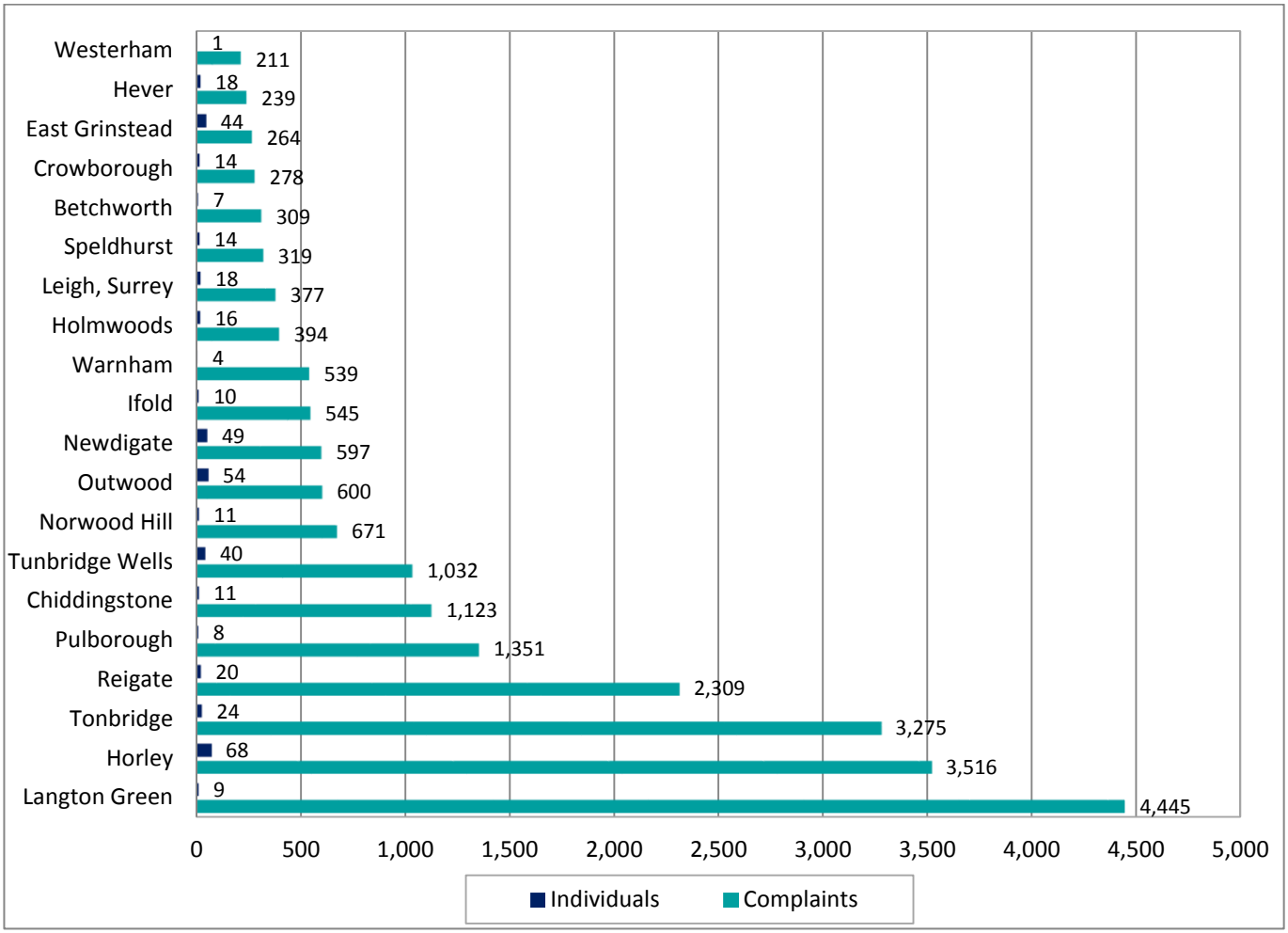


FIGURE 45 - THE TOP 20 LOCATIONS FOR COMPLAINTS IN 2018



NOISE AND TRACK KEEPING SYSTEM

The Noise and Track Keeping system automatically correlates aircraft to specific complaints, thereby allowing comprehensive analysis of the flights that are causing concern for local communities.

Our Noise and Track Keeping software can also automatically assign a particular aircraft operation with a complaint and therefore enable us to provide statistics on whether departing or arriving aircraft are the cause for complaint. The system can also analyses the types of aircraft that have caused concern. These statistics are provided overleaf in **Figure 46** and **Figure 47.**

FIGURE 46 - THE ANALYSIS OF THE DISTRIBUTION OF COMPLAINTS AGAINST AIRCRAFT TYPES COMPARED TO TOTAL MOVEMENTS 2018

Type	Total Movements	Number of Complaints	% Movements	% Complaints
Airbus A320	57,440	4,722	20.23%	25.94%
Airbus A319	82,305	3,873	28.99%	21.27%
Boeing 737	43,899	2,740	15.46%	15.05%
Airbus A380	2,228	972	0.78%	5.34%
Airbus A321	3,296	948	1.16%	5.21%
Airbus A330	4,830	798	1.70%	4.38%
Boeing 777	8,461	773	2.98%	4.25%
Boeing 787	10,684	744	3.76%	4.09%
Boeing 747	2,759	608	0.97%	3.34%
Boeing 757	5,659	371	1.99%	2.04%
Helicopters	46	295	0.02%	1.62%
Other Small Jets	319	245	0.11%	1.35%
Airbus A320 Neo	39,870	204	14.04%	1.12%
Boeing 767	1,722	197	0.61%	1.08%
Embraer 195	4,823	172	1.70%	0.94%
Airbus A350	1,142	130	0.40%	0.71%
Airbus A321 Neo	8,672	98	3.05%	0.54%
Embraer 190	1,050	69	0.37%	0.38%
Cessna Citation	163	54	0.06%	0.30%
Boeing 737 MAX 8	790	42	0.28%	0.23%
Bombardier CSeries /Airbus A220	1,190	39	0.42%	0.21%
Embraer 175	266	28	0.09%	0.15%
Airbus A310	294	23	0.10%	0.13%
ATR 75	1,530	20	0.54%	0.11%
Non-Gatwick Aircraft	N/A	19	N/A	0.10%
Airbus A340	46	7	0.02%	0.04%
Embraer 170	126	6	0.04%	0.03%
Gulfstream	68	5	0.02%	0.03%
Antonov 124	2	2	0.00%	0.01%
Canadair Regional Jet	89	1	0.03%	0.01%
Embraer RJ145	96	1	0.03%	0.01%
Dassault Falcon	59	0	0.02%	0.00%
Ilyushin IL96	2	0	0.00%	0.00%

Study of these figures would suggest that aircraft noise is not always the primary issue as it appears it is the frequency of the aircraft that provokes more complaints. It would appear that the most common aircraft types operating at Gatwick receive the most complaints.

We may also receive complaints about aircraft that are in transit to or from other airfields, in these cases we would direct the complainant to the appropriate airfield.

Figure 47 overleaf shows aircraft types classified by their comparable size and the percentage of complaints received per movement.

FIGURE 47 - THE ANALYSIS OF COMPLAINTS AGAINST AIRCRAFT TYPE BY COMPARATIVE SIZE 2018

Class	Type	Total Movements	Number of Complaints	% Movements	% Complaints
Large	Airbus A380	2,228	972	0.78%	5.34%
Large	Airbus A330	4,830	798	1.70%	4.38%
Large	Boeing 777	8,461	773	2.98%	4.25%
Large	Boeing 787	10,684	744	3.76%	4.09%
Large	Boeing 747	2,759	608	0.97%	3.34%
Large	Boeing 767	1,722	197	0.61%	1.08%
Large	Airbus A350	1,142	130	0.40%	0.71%
Large	Airbus A340	46	7	0.02%	0.04%
Large	Other Large Jets	4	2	0.00%	0.01%
Medium	Airbus A320	57,440	4,722	20.23%	25.94%
Medium	Airbus A319	82,305	3,873	28.99%	21.27%
Medium	Boeing 737	43,899	2,740	15.46%	15.05%
Medium	Airbus A321	3,296	948	1.16%	5.21%
Medium	Boeing 757	5,659	371	1.99%	2.04%
Medium	Airbus A320 Neo	39,870	204	14.04%	1.12%
Medium	Embraer 195	4,823	172	1.70%	0.94%
Medium	Airbus A321 Neo	8,672	98	3.05%	0.54%
Medium	Embraer 190	1,050	69	0.37%	0.38%
Medium	Boeing 737 MAX 8	790	42	0.28%	0.23%
Medium	Bombardier CSeries /Airbus A220	1,190	39	0.42%	0.21%
Medium	Embraer 175	266	28	0.09%	0.15%
Medium	Airbus A310	294	23	0.10%	0.13%
Medium	Other Embraer Jets	222	7	0.08%	0.04%
Small	Other Small Jets	467	246	0.16%	1.35%
Small	Cessna Citation	163	54	0.06%	0.30%
Small	ATR 75	1,530	20	0.54%	0.11%
Small	Gulfstream	68	5	0.02%	0.03%
Other	Helicopters	46	295	0.02%	1.62%
Other	Non-Gatwick Aircraft	N/A	19	N/A	0.10%

Figure 47 also confirms that there are more complaints for the more common aircraft types at Gatwick rather than related to the size of the aircraft. The aircraft with the greatest numbers of movements are classed as medium sized aircraft and these appear to have the greatest number of complaints. Helicopters are also a source of complaint, however very few operate from Gatwick, all of our complaints on this subject relate to either police/air ambulance flights from Redhill Aerodrome or military flights.

Gatwick Airport remains dedicated to reducing the noise impact of its operations on local communities. In line with current Government guidance, we are actively looking at new innovative ways of reducing the number of people impacted by Gatwick traffic. We will continue to work with our airlines, Air Traffic Control and local community representatives to improve the noise environment around the Airport.

If you would like to find out more information about Gatwick aircraft and noise in your area you can visit **www.gatwickairport.com/noise**

Glossary

Gatwick Airport Limited (GAL) is the company licensed to operate Gatwick Airport by the Civil Aviation Authority. Gatwick is wholly-owned by Ivy Bidco Limited (Ivy), a company formed to undertake the acquisition of Gatwick. Ivy is ultimately controlled by funds managed by Global Infrastructure Management, LLC, and part of Global Infrastructure Partners (GIP).

Department for Transport (DfT) is the government department responsible for the English transport network and a limited number of transport matters in Scotland, Wales and Northern Ireland which are not devolved. The department is run by the Secretary of State for Transport.

Civil Aviation Authority (CAA) is the UK's independent specialist aviation regulator. Its activities include economic regulation, airspace policy, safety regulation and consumer protection.

Air Traffic Control (ATC): See ANS below

ANS (Air Navigation Solutions) is the air navigation service provider at Gatwick Airport and is located in the control tower onsite.

NATS is the main air navigation service provider in the United Kingdom. It provides en-route air traffic control services to flights within the UK Flight Information Regions and the Swanwick Oceanic Control Area, and provides air traffic control services to fifteen UK airports and Gibraltar Airport.

Flight Performance Team (FPT) is responsible for recording, investigating and responding to aircraft noise enquiries as well as to monitor and report airline compliance to noise mitigation measures as detailed in the UK Aeronautical Information Publication. The FEU also manages a number of fixed and mobile noise monitors within the local area. They are regularly relocated, the data analysed and the findings reported.

Gatwick Airport Consultative Committee (GATCOM) is a committee set up in 1956 in order to meet statutory requirements for public consultation. GATCOM discusses issues relating to employment, surface access and resource use as well as aircraft performance. It is comprised of members of local authorities, local interest groups, business and airline representatives and the DfT and is advised by senior managers from GAL.

Noise and Track Monitoring Advisory Group (NaTMAG) is chaired by GAL with membership drawn from DfT, NATS, GATCOM, the airline industry, local Environmental Health Officers and GAL's acoustic consultants. It oversees the administration of the environmental monitoring systems used by the FEU and discusses local issues concerning aircraft noise and track keeping.

Flight Operations Performance and Safety Committee (FLOPSC). This Committee ensures the development of best practice in flight operations by all airlines using Gatwick Airport in order to minimise their effect on the local community. Matters discussed include departure track keeping, continuous descent operations and noise infringements. FLOPSC meets bi-monthly and is chaired by GAL and is attended by the FEU, DfT, NATS, airlines and a representative of GATCOM.

Decibels (dBA): Noise measurement that takes closest account of human hearing. It is used to measure aircraft noise.

Leq - Equivalent Continuous Sound Level: The notional sound pressure level which, if maintained constant over a given time, delivers the same amount of acoustic energy at some point as the time-varying sound pressure level would deliver at the same point and over the same period of time.

Noise monitors (fixed): Sited at either end of the runway to measure the noise of departing aircraft. The readings from these are the only ones that can determine a noise infringement.

Noise monitors (mobile): Sited in various locations around Gatwick to aid studies into the local noise climate.

Noise limits: Levels fixed by the Department for Transport which should not be exceeded by departing aircraft.

Noise infringements: If the above level is exceeded, the airline concerned receives a financial surcharge.

Start of roll: Point where a departing aircraft releases its parking brakes to commence take off roll.

Noise Preferential Route (NPR): It consists of a 'centreline' and an associate compliance monitoring swathe (3km across, i.e. 1.5km either side of the NPR centreline) in which departing aircraft must remain to an altitude of 3,000 or 4,000ft. These are used to provide set routes aircraft must follow and so provide some certainty as to which areas will be over flown by departing aircraft.

Standard Instrument Departure (SID): This is a published flight procedures followed by aircraft on an Instrument Flight Rules flight plan immediately after take-off from an airport. The first section of a SID is an NPR.

Vectoring: Air Traffic Control procedure turning a departing aircraft off an NPR on to a more direct heading to its destination.

Holding stack: The area where aircraft circle at a minimum 7,000ft, awaiting approach instructions during busy periods.

Instrument Landing System (ILS): Precision approach aid consisting of a number of elements, principally a localiser radio beam and glide path aerials. It guides aircraft through final approach to touchdown.

Continuous Descent Operations (CDO): A noise abatement procedure for arrivals. It avoids periods of level flight, reducing noise and emissions. It is advisory, but not compulsory.

Reverse thrust: A braking procedure used by older landing aircraft. Noisy, so use is discouraged at night.

Go-around: An aborted landing of an aircraft that is on final approach. The aircraft turns and gets back in the queue to land.

Restrictions: Formulated by the Department for Transport relating to types of aircraft that can fly at night and placing limits on movements. It is strictly monitored by Gatwick Airport Limited.

Night period is the period from 23:00 to 07:00.

Night quota period is the period from 23:30 to 06:00.

Quota count - QC: Points ranging from 0.25 to 16, allocated to aircraft types. The quieter the type, the lower the quota count. Aircraft with a rating of QC4, 8 or 16 may not be scheduled to take off or land during the night quota period. QC8 and 16 types may not be scheduled to take off or land in the night period.

Movements limits: The number of movements permitted during the night period, differing between seasons.

Seasons: There are two seasons, winter and summer. It is determined by use of GMT/BST.

Dispensations: Granted to aircraft not normally permitted to fly during the night. Exceptional circumstances are (a) delays likely to lead to serious congestion at the Airport or serious hardship or suffering to passengers or animals and (b) delays resulting from widespread and prolonged disruption to Air Traffic Control. Further dispensations may be granted in respect of VIP flights, relief flights carrying supplies, military aircraft operations in the event of war and civil aircraft affected by hostilities.

08R: Main runway used when aircraft are departing towards the east and arriving from the west.

26L: Main runway used when aircraft are departing towards the west and arriving from the east.

08L: Northern or standby runway used when aircraft are departing towards the east and arriving from the west.

26R: Northern or standby runway used when aircraft are departing towards the west and arriving from the east.

Altitude: The distance of an aircraft above mean sea level (amsl).

Height: The distance of an aircraft above airfield level (aal). Gatwick is 202ft amsl.

Nm: Nautical Mile.

NMB: Noise Management Board, a committee set up to reduce the impact of noise on local communities around the Airport.

NTK: Noise and Track Keeping System, this system was previously provided by Casper but will be replaced in 2019 by a new system.

REFERENCES

WHO (2018) Environmental Noise Guidelines for the European Region, available at: **http://www.euro.who.int/__data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf?ua=1**

For further reading on the subject of noise you can access our latest reports on our website: **www.gatwickairport.com/aircraftnoiseandairspace**

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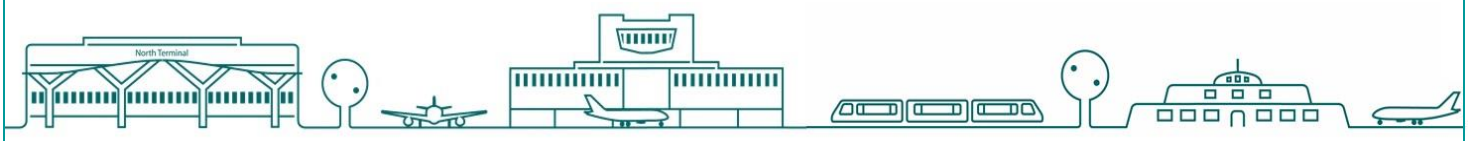

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Gatwick