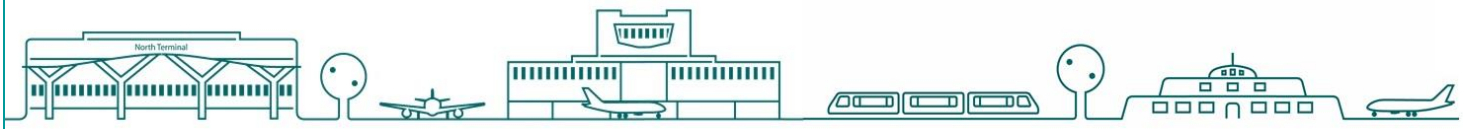
# Gatwick Airport
# Flight Performance Team
# Annual Report 2017

This report covers the period
(1st January 2017 – 31st December 2017)




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, with around 57 airlines 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. Our ambition is to compete to grow and become London's airport of choice, by delivering great service to passengers and investing in new facilities.

We believe this will enable Gatwick to continue to grow to serve around 45 million passengers each year over the next decade. We also 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 Team reports together with our noise related key performance indicators.

With the introduction of new aircraft types, such as the B787 Dreamliner and Airbus A380 and A320 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the noise footprint generated by aircraft operations has reduced in area as older, noisier types of aircraft have been withdrawn.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 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. The International Civil Aviation Organisation (ICAO) is the international regulator of aviation. 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 Flight Performance Team (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 £200,000 a year on noise monitoring. This includes a Noise and Track keeping system called 'Casper' that combines radar input from Air Traffic Control (ATC) with data from our fleet of fixed and mobile monitors placed around the airport. The FPT 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 Casper 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 publically available online tool Noise Lab provides data on aircraft noise recorded at a wide range of sites around the airport. It also has an animation that illustrates the complexity of aircraft routes throughout Western Europe and the UK and includes a flight tracking tool for Gatwick aircraft. All this can be found: **http://noiselab.casper.aero/lgw/** It has also been made available for use on mobile devices.

## 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 was 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.

## FLY QUIET AND CLEAN

As part of the Fly Quiet and Clean Programme, we publish our major airlines' performance against our key environmental metrics. These tables can be found in the later pages of this report. Airlines are an essential part of the Fly Quiet and Clean Programme and through collaborative working; we are constantly striving to improve performance across the board.

## NATMAG

This committee includes representatives from the airports 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 Improvements Group. The 'mission statement' of this group is *"Working with the industry in the UK and internationally to trial & 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 (KPIs), 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] | | | | |
|---|---|---|---|---|---|
| | 2017 | 2016 | 2015 | 2014 | 2013 |
| Track keeping performance (% on track)[2] | 98.06% | 98.56% | 99.71% | 99.28% | 98.04% |
| 24hr CDO (% achievement)[4] | 90.48% | 88.58% | 89.75% | 92.61% | 91.36% |
| Day/Shoulder CDO (% achievement) | 90.56% | 88.18% | 89.21% | 92.43% | 91.13% |
| Core night CDO (% achievement) | 89.60% | 92.90% | 95.32% | 95.25% | 94.04% |
| 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) | 2 | 1 | 0 | 0 | 0 |
| Individual complainants | 997 | 2324 | 1746 | 3366 | 533 |
| Total noise complaints received[5] | 24658 | 17715 | 15189 | 21712 | 2296 |
| Enquiry response performance target is 95% within 8 days (quarter) | 99.89% | 46.55% | 93.89% | 73.39% | 99.24% |
| West/East Runway Split (%) | 78/22 | 67/33 | 70/30 | 67/33 | 63/37 |

## FIGURE 2 – KEY PERFORMANCE INDICATORS (KPIs) 2017 IN COMPARISON TO A 2011 BASELINE

| Parameter | 12 Month Performance averages in comparison to 2011[1] | | | | |
|---|---|---|---|---|---|
| | +/- | 2017 | 2016 | 2011 | 2006 |
| Track keeping performance (% on track)[2] | ▲ | 98.06% | 98.56% | 97.47% | 98.17%[3] |
| 24hr CDO (% achievement)[4] | ▼ | 90.48% | 88.58% | 90.49% | 80.79% |
| Day/Shoulder CDO (% achievement) | ▲ | 90.56% | 88.18% | 90.19% | 79.9% |
| Core night CDO (% achievement) | ▼ | 89.60% | 92.90% | 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) | ▼ | 2 | 1 | 4 | 2 |
| Individual complainants | ▲ | 997 | 2324 | 343 | 587 |
| Total noise complaints received[5] | ▲ | 24658 | 17715 | 2673 | 4791 |
| Enquiry response performance target is 95% within 8 days | ▲ | 99.89% | 46.55% | KPI 95% | |
| West/East Runway Split (%) | - | 78/22 | 67/33 | 67/33 | 68/32 |

[1]The colours indicate the most recent 12 month performance compared to 2011, with green showing an improvement and red a decline in 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, advises 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.

FIGURE 3 - THE AVERAGE NUMBER OF AIRCRAFT MOVEMENTS PER 24 HOUR PERIOD IN 2017

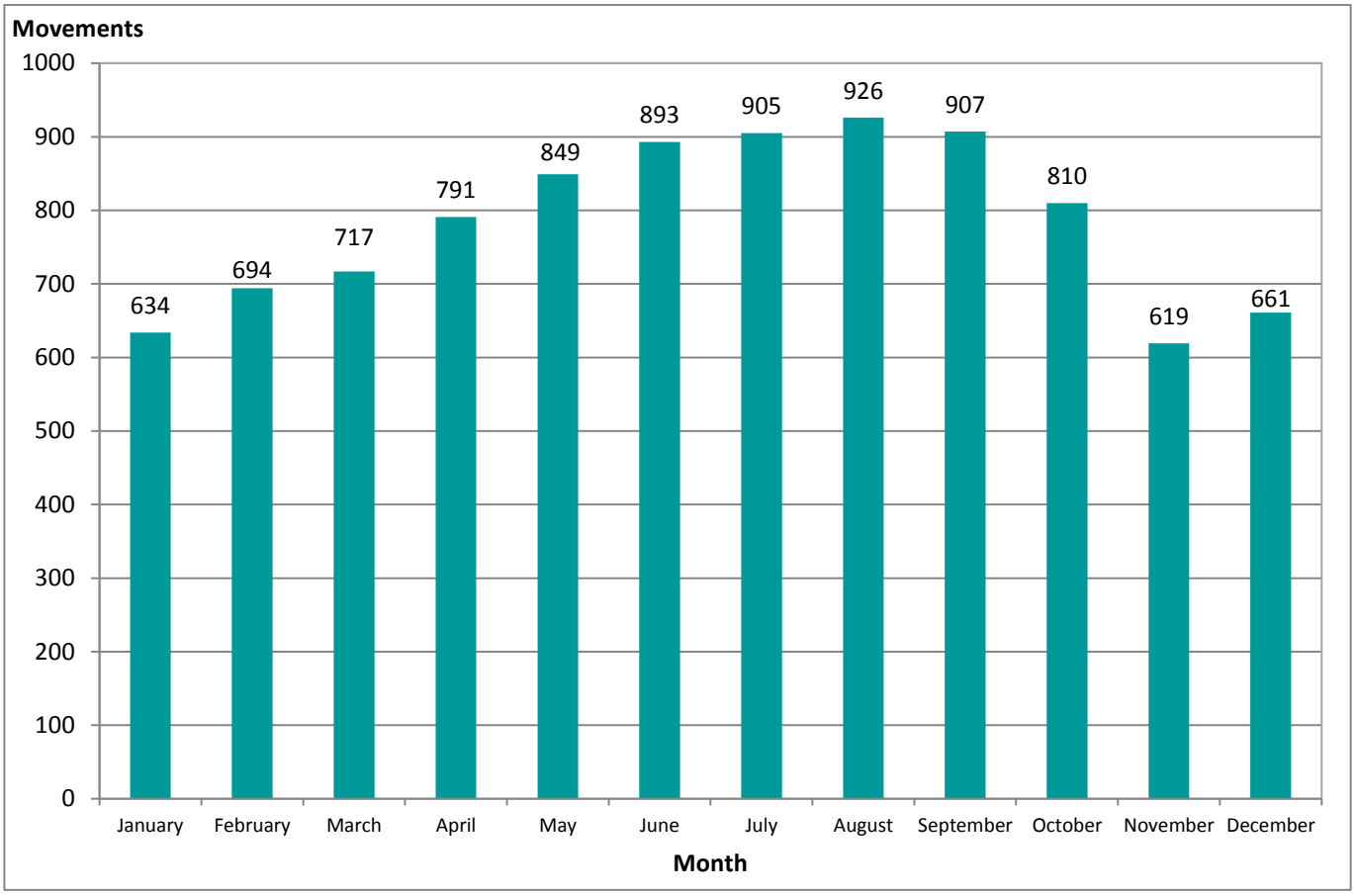



FIGURE 4 - THE TOTAL AIRCRAFT MOVEMENTS PER YEAR (2006-2017)

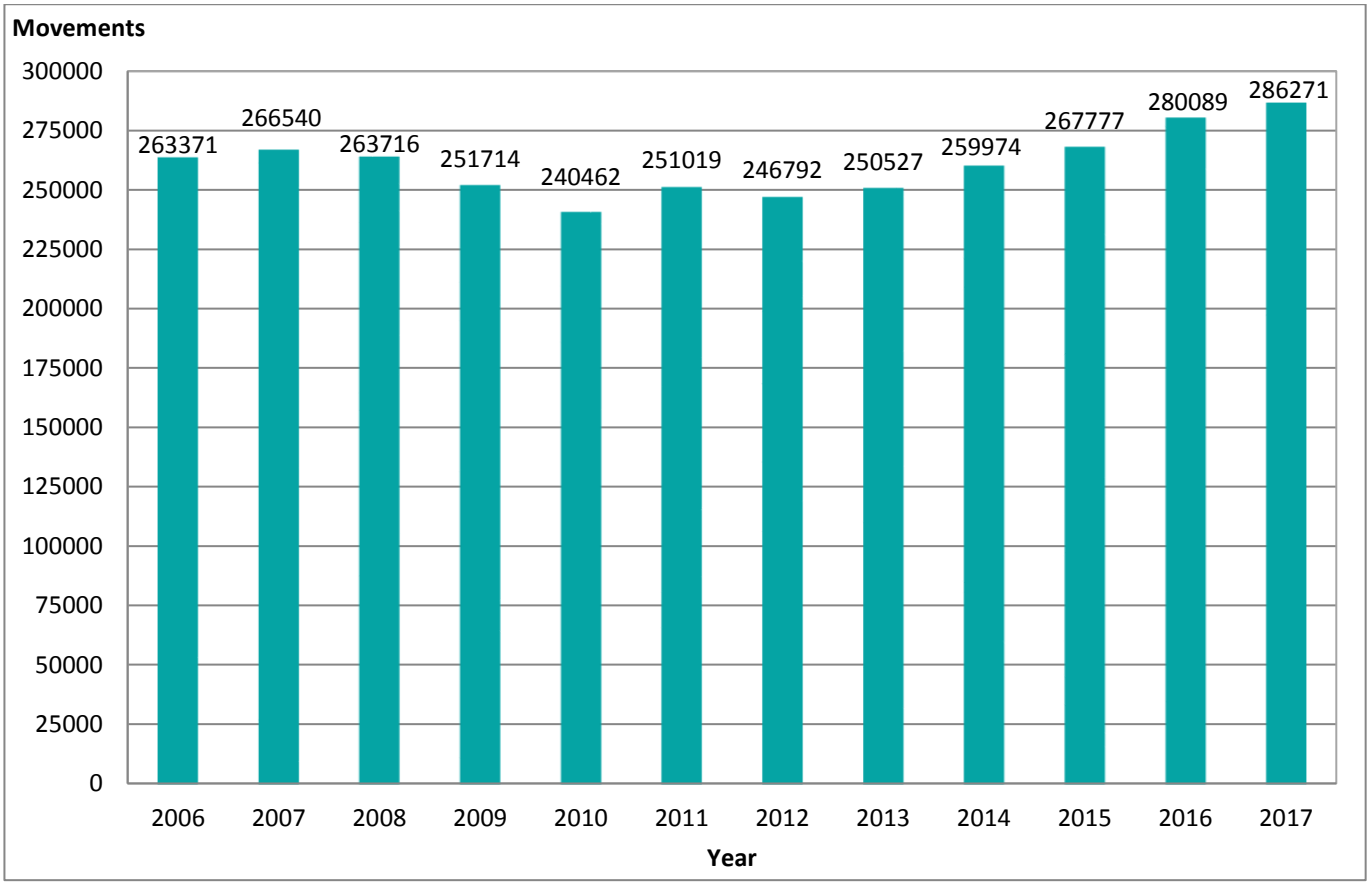


**Figure 3** shows the average number of air traffic movements per 24 hour period over the year. This illustrates that the peak months at Gatwick are during the summer with over 900 flights recorded on some of our busiest days.

In 2017, there was an increase of about 2.2% in overall movements compared to 2016. **Figure 4** shows the changes in traffic figures over the past several years. This year has been the busiest year for total passenger numbers and also 2017 has seen the greatest number of aircraft movements to date.

The mix of aircraft types that operate at Gatwick continues to evolve with airlines introducing newer, more efficient and quieter types.

Both TUI and Norwegian 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 A320 has surpassed the A319 to be the most numerous aircraft type operated at Gatwick as this type makes up a large part of the easyJet fleet, who remain Gatwick's biggest operator. They have also begun to introduce the A320 Neo family of aircraft which are much quieter than their counterparts due to more advanced engine and aircraft design. 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 2017 & 2016 WITH PERCENTAGE CHANGE

| Aircraft Type | 2017 | 2016 | +/- |
|---|---|---|---|
| Airbus A320 | 94363 | 87381 | +8.0% |
| Airbus A319 | 87821 | 88035 | -0.2% |
| Boeing 737 | 47074 | 49965 | -5.8% |
| Airbus A321 | 13650 | 15978 | -14.6% |
| Boeing 777 | 8232 | 7232 | +13.8% |
| Boeing 757 | 6433 | 5630 | +14.3% |
| Boeing 787 | 6738 | 5287 | +27.5% |
| Embraer 195 | 5180 | 4864 | +6.5% |
| Airbus A330 | 3907 | 3459 | +13.0% |
| Boeing 747 | 3159 | 2990 | +5.7% |
| Airbus A380 | 2094 | 2194 | -4.6% |
| Boeing 767 | 2170 | 2144 | +1.2% |
| ATR 72 | 1338 | 1214 | +20.1% |
| Embraer 190 | 928 | 862 | +7.6% |
| Dash 8 Prop | 8 | 506 | -98.4% |
| Fokker 100 | 26 | 406 | -93.6% |
| Other Small Jets | 334 | 404 | -17.3% |
| Airbus 310 | 440 | 396 | +11.1% |
| Cessna Citation | 168 | 256 | +34.4% |
| Airbus A350 | 618 | 140 | +341.0% |
| Canadair Regional Jet | 28 | 138 | -79.7% |
| Other Embraer Jets | 146 | 124 | +17.7% |
| Dassault Falcon | 70 | 114 | -38.6% |
| Gulfstream | 108 | 114 | -5.3% |
| McDonnell Douglas | 82 | 96 | -14.6% |
| Embraer 175 | 54 | 84 | -35.7% |
| Airbus A340 | 16 | 76 | -79.0% |
| Bombardier CS300 | 742 | 0 | +100.0% |

## WIND DIRECTION

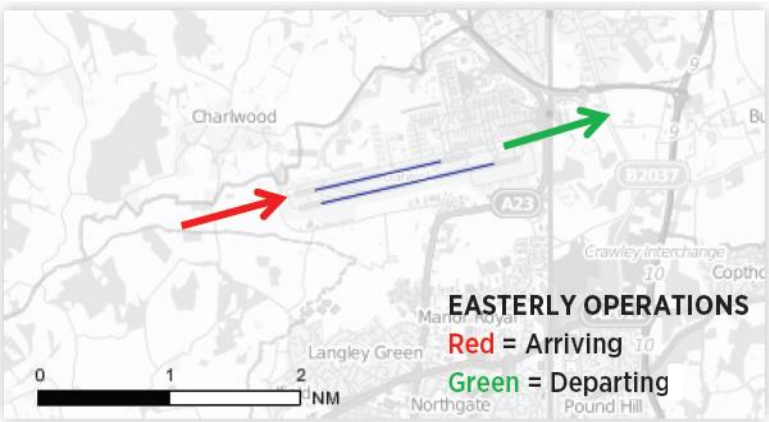
South westerly and westerly winds prevail for much of the year, typically around 70 per cent of the time. Changes in the direction of operation will influence overflight of areas as sometimes aircraft are only apparent when the airfield is operating in one direction or another.

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 which mirrors the unpredictability of the UK's weather.

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 2017 where Gatwick predominately experienced westerly operations.

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



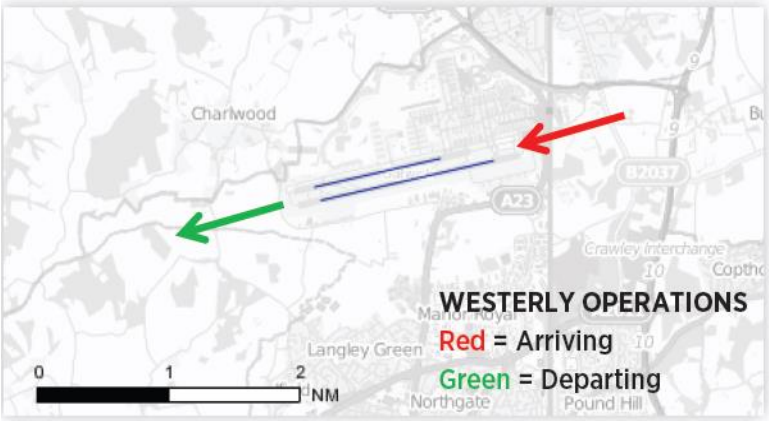



FIGURE 7 – THE SPLIT IN RUNWAY DIRECTION FOR 2017

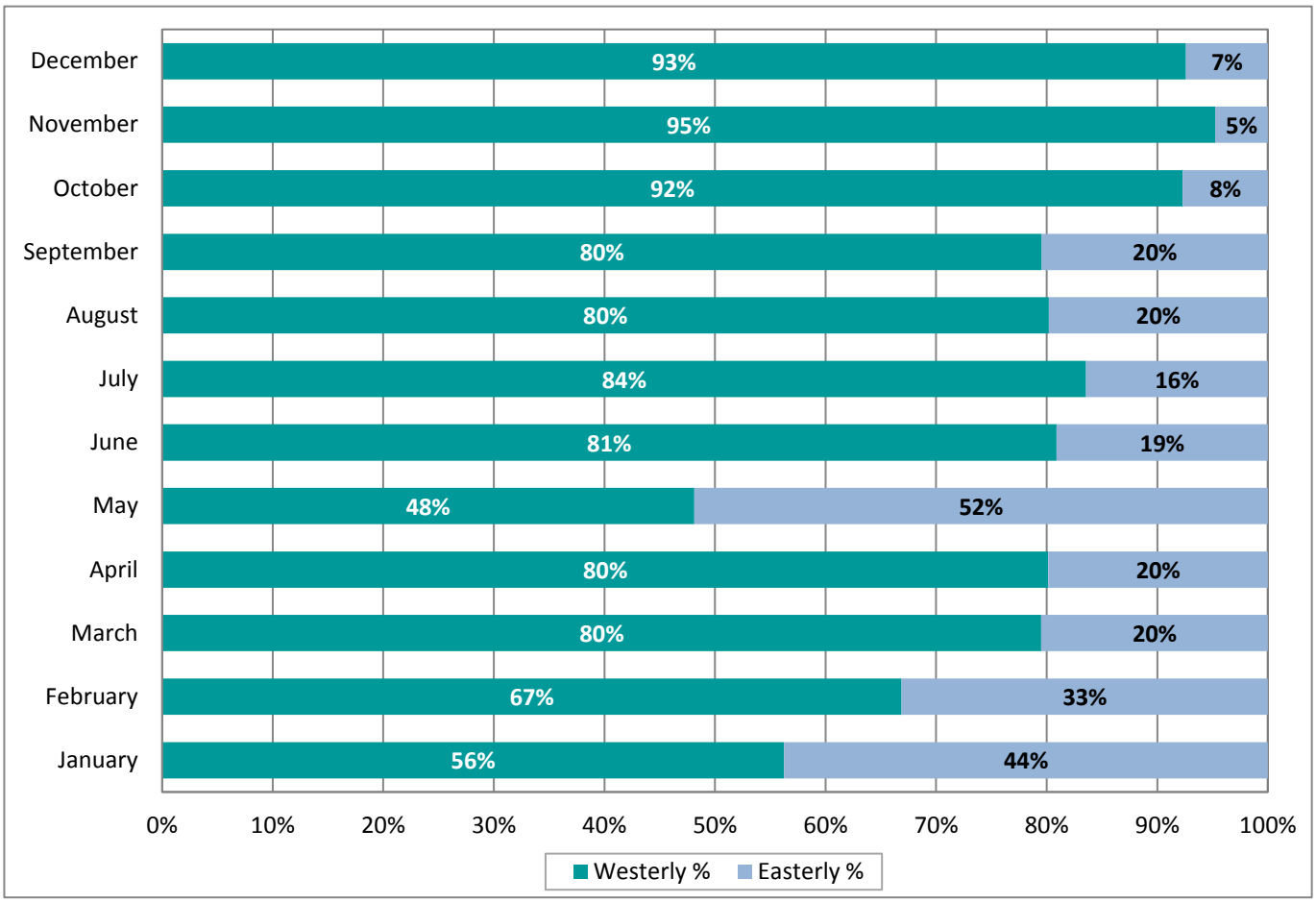



FIGURE 8 - THE TIME PERIODS WITH THE HIGHEST AND LOWEST EASTERLY AND WESTERLY OPERATIONS

| Month | Highest Westerly | | Lowest Westerly | |
|---|---|---|---|---|
| January | 2015 | 90.7% | 2006 | 43.1% |
| February | 2000 | 97.9% | 2013 | 44.0% |
| March | 1999 | 84.9% | 2013 | 19.7% |
| April | 2001 | 82.9% | 2007 | 36.3% |
| May | 2003 | 86.9% | **2008** | **15.1%**[2] |
| June | 2002 | 89.9% | 2014 | 51.4% |
| July | 2010 | 96.9% | 2013 | 51.1% |
| August | 2009 | 93.2% | 2003 | 50.4% |
| September | 2012 | 87.7% | 2002 | 32.0% |
| October | 2000 | 93.1% | 2016 | 37.2% |
| November | 2017 | 95.2% | 2014 | 49.5% |
| December | **2011** | **98.8%**[1] | 2001 | 48.5% |

[1]Red indicates the highest westerly operations recorded over time.

[2]Blue indicates the lowest westerly operations recorded over time.

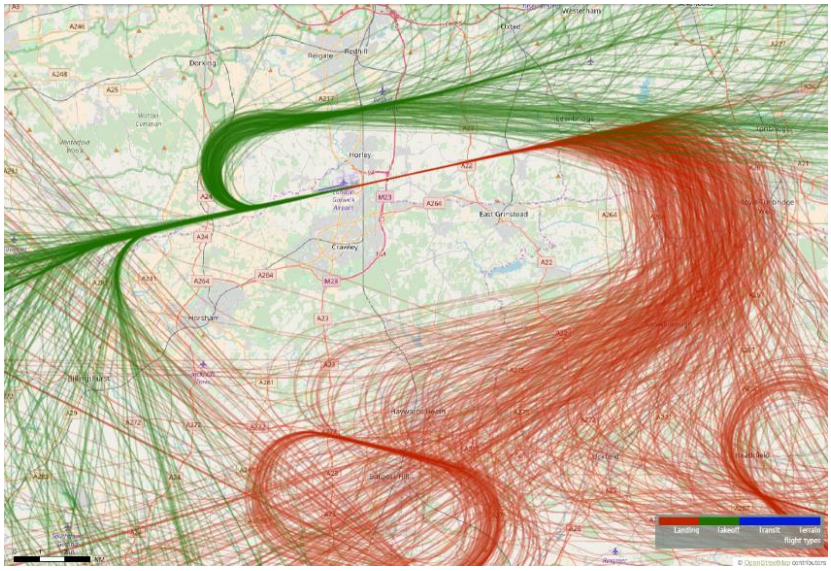
## WHERE AIRCRAFT FLY

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.

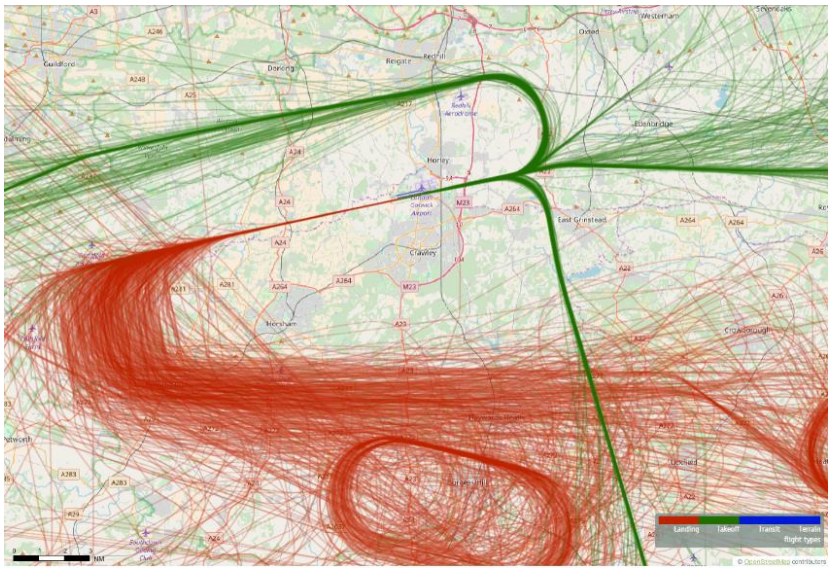
Aircraft are required to take off and land into the wind and therefore the prevailing wind direction determines the direction of airfield operation. When the wind is coming from the west, aircraft will depart towards the west and arrive from the east (westerly operations). During these times aircraft 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 DAY OF WESTERLY OPERATIONS AND A TYPICAL DAY OF EASTERLY OPERATIONS

WESTERLY OPERATIONS




EASTERLY OPERATIONS



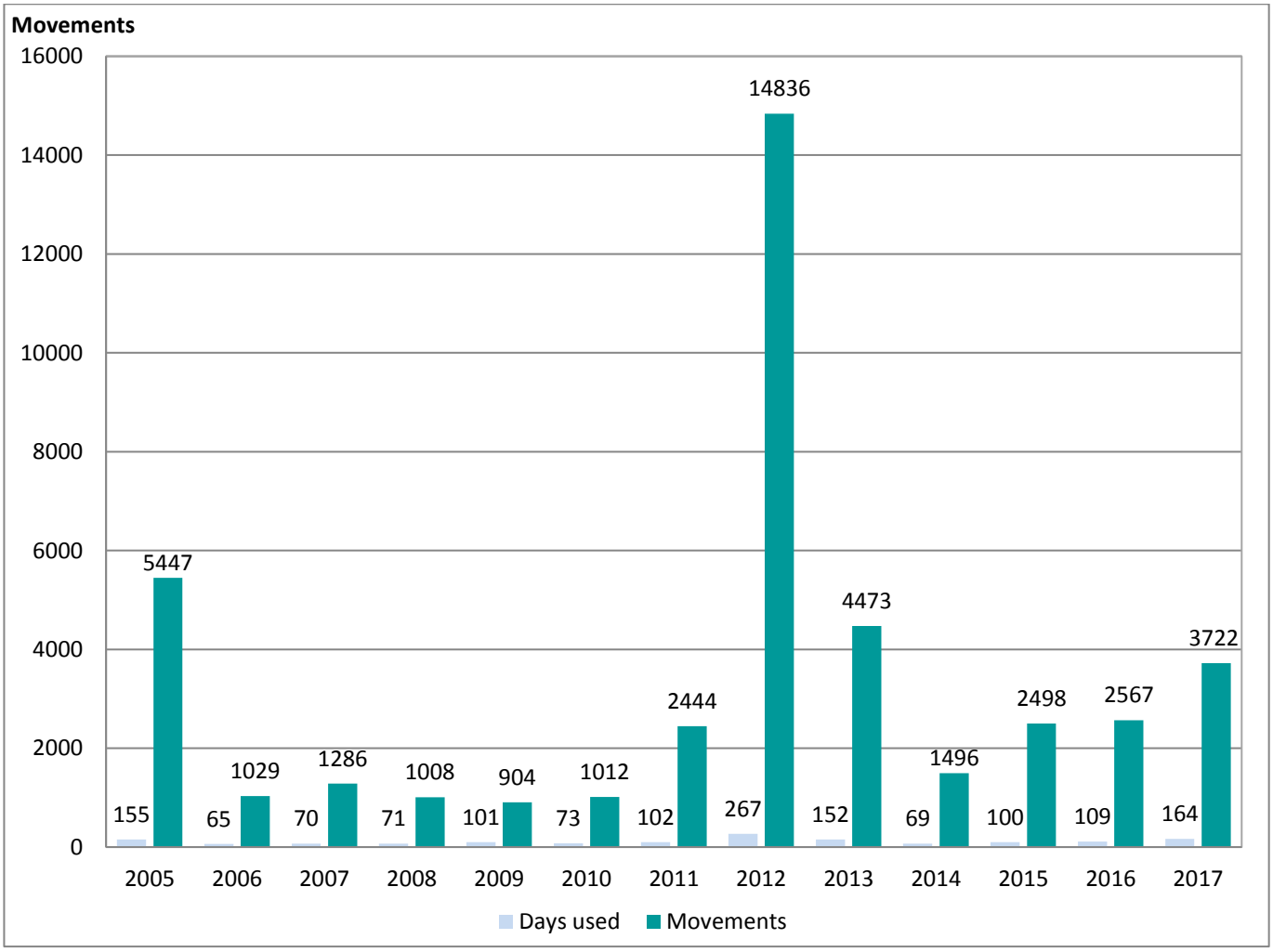
## STANDBY RUNWAY

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.

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, the 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/aircraftnoiseandairspace**

Air Traffic Control (ATC) is responsible for the routing 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 ATCdirect 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 tagged 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 modernization. It was designed decades ago in the late 1960s and early 1970s 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 2017 has been our busiest year for total passenger numbers and air traffic movements.

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 routing 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.

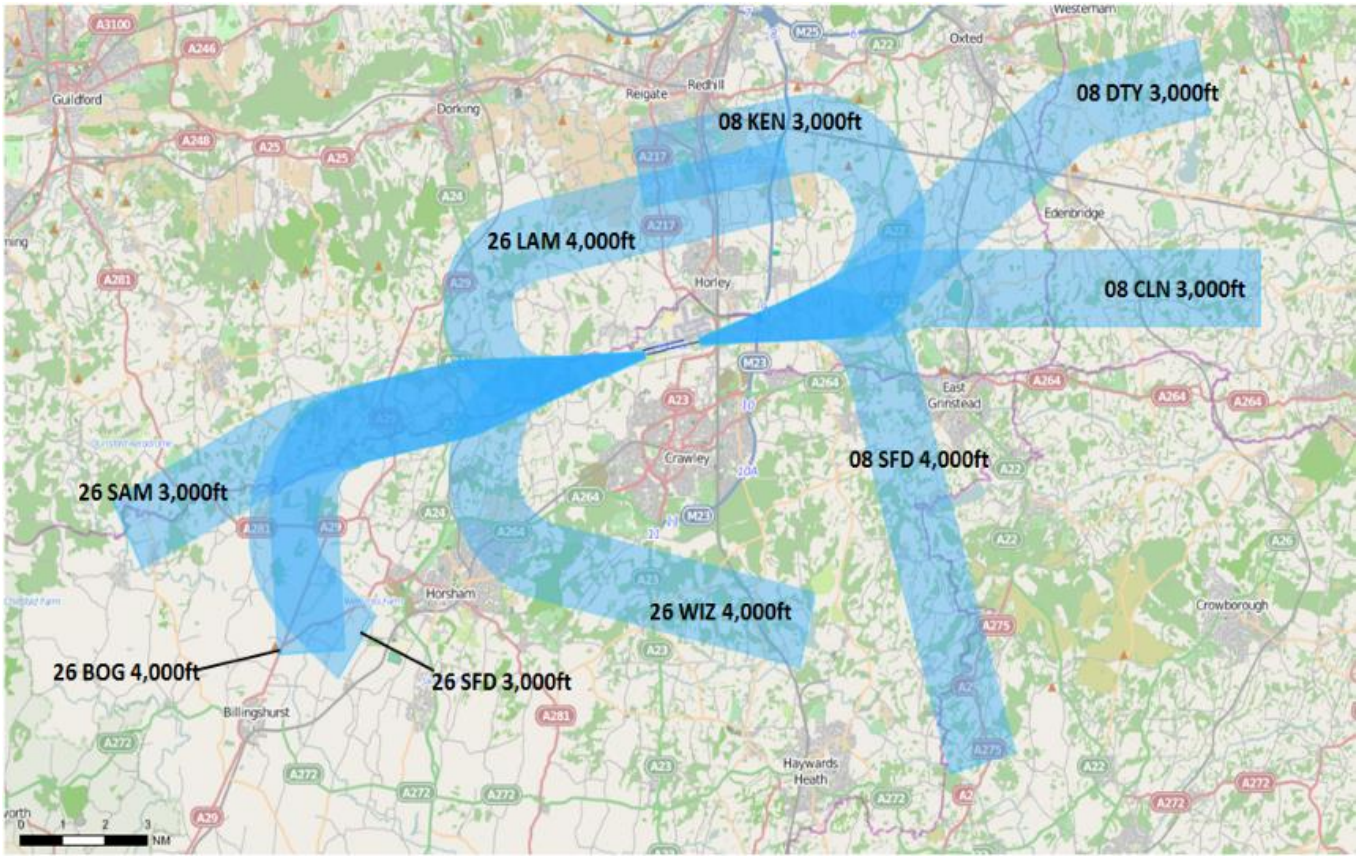
Following the introduction of P-RNAV, the CAA conducted a Post-Implementation Review (PIR) to ensure that the tracks flown by aircraft were compliant with regulations. They identified Route 4 as necessitating immediate attention therefore the CAA asked the Airport to design a solution to rectify the 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.

Post-report note: This decision has since by quashed by the Court at the request of the CAA. The result is that the Route 4 P-RNAV SID routes remain in place but will revert to a temporary status as was the case prior to the amendment. We will continue to follow CAA guidance through this process and will work closely with them to understand the next steps. This may involve a further redesign of Route 4 but no changes are anticipated in the short term.

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 aims 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 until the 30th September 2017 to ensure aircraft were operating as anticipated. As with Route 4, Gatwick engaged with the relevant parties to collate feedback and provide track data to the CAA. 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 A320 is the most widely used aircraft type at Gatwick and has an excellent record for track keeping.

FIGURE 12 – TRACK KEEPING PERFORMANCE BY AIRCRAFT TYPE 2017

| Aircraft Type | Total Departures | Percentage On Track |
|---|---|---|
| Airbus A320 | 47177 | 97.69% |
| Airbus A319 | 43911 | 98.78% |
| Boeing 737 | 23537 | 98.73% |
| Airbus A321 | 6829 | 98.11% |
| Boeing 777 | 4115 | 97.96% |
| Boeing 787 | 3369 | 97.42% |
| Boeing 757 | 3216 | 96.11% |
| Embraer family | 3154 | 99.37% |
| Airbus A330 | 1954 | 98.11% |
| Boeing 747 | 1579 | 95.57% |
| Boeing 767 | 1085 | 98.06% |
| Airbus A380 | 1047 | 79.75% |
| ATR 72 | 669 | 98.95% |
| Bombardier CS300 | 371 | 99.46% |
| Airbus A350 | 309 | 92.56% |
| Airbus A310 | 220 | 99.09% |
| Light Aircraft | 104 | 87.50% |
| Cessna Citation | 84 | 94.05% |
| Gulfstream | 54 | 98.15% |
| McDonnell Douglas | 41 | 95.12% |

[1] Monarch Airlines ceased operations 2nd October 2017

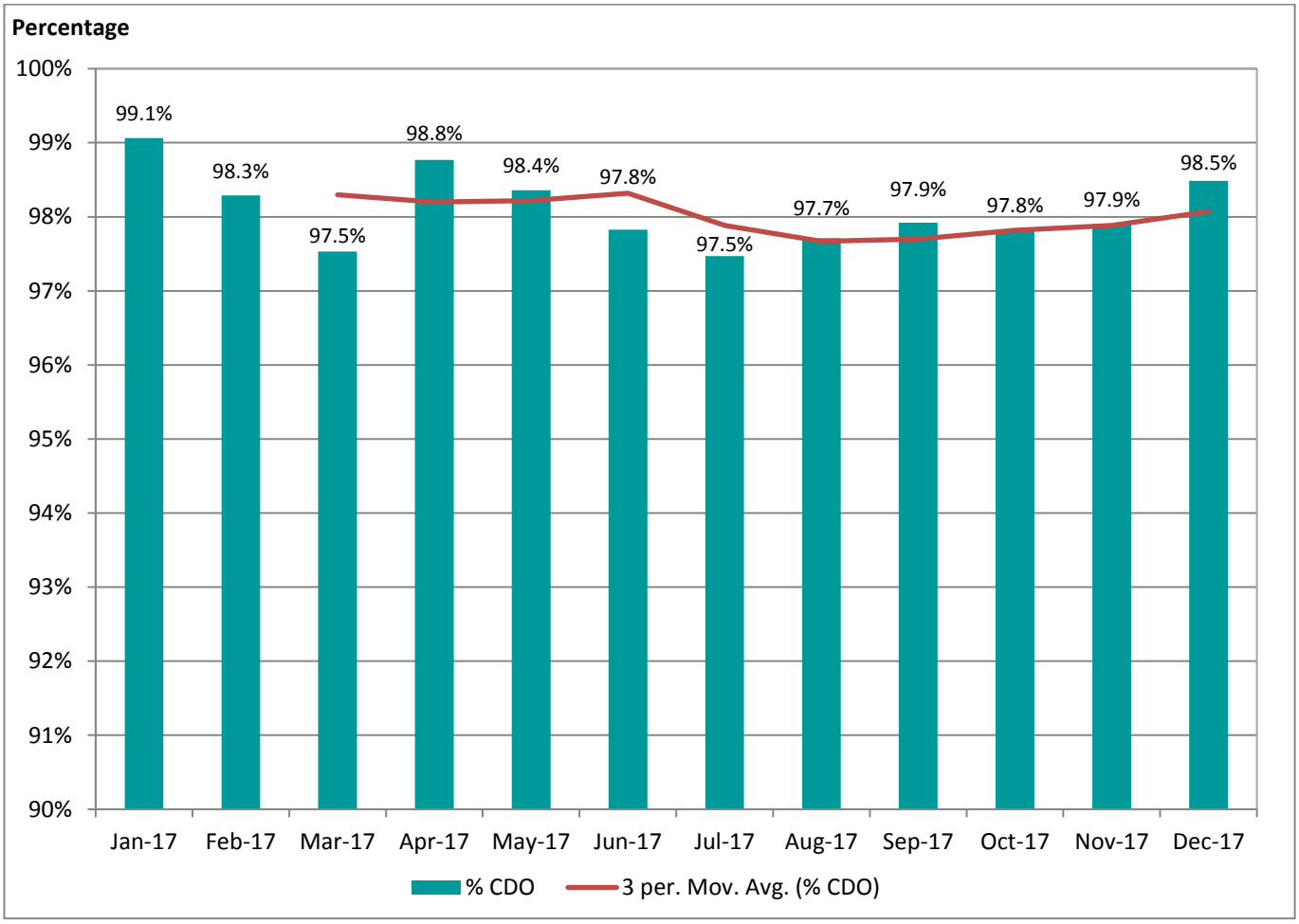
FIGURE 13 – TRACK KEEPING PERFORMANCE BY AIRLINE 2017

| Airline | Total Departures | Percentage On Track |
|---|---|---|
| easyJet | 59844 | 98.23% |
| British Airways | 22884 | 97.83% |
| Norwegian Air | 13394 | 98.67% |
| TUI | 6465 | 98.99% |
| Ryanair | 4942 | 99.45% |
| Monarch Airlines[1] | 4344 | 99.24% |
| Vueling Airlines | 3955 | 99.54% |
| Thomas Cook Airlines | 3569 | 98.66% |
| Aer Lingus | 2249 | 99.69% |
| Virgin Atlantic | 2138 | 96.68% |
| Aurigny Air Services | 2002 | 99.45% |
| easyJet Switzerland | 1499 | 99.87% |
| TAP Portugal | 1238 | 99.68% |
| Emirates Airlines | 1102 | 80.76% |
| Turkish Airlines | 1021 | 88.34% |
| Flybe | 963 | 99.79% |
| WestJet | 924 | 97.94% |
| Air Europa | 733 | 100% |
| Iberia Express | 722 | 99.72% |
| Air Transat | 677 | 97.34% |
| Ukraine International | 671 | 97.62% |
| WOW Air | 686 | 96.06% |
| AirBaltic | 528 | 98.11% |
| Germania | 493 | 98.78% |
| Travel Service Airlines | 403 | 94.54% |
| Icelandair | 384 | 79.95% |
| Aeroflot | 364 | 91.76% |
| Small Planet Airlines | 357 | 78.71% |
| Royal Air Maroc | 353 | 99.72% |
| Air Malta | 323 | 98.76% |
| Wizz Air | 308 | 94.16% |
| Cathay Pacific | 289 | 93.77% |
| Titan Airways | 278 | 100% |
| Enter Air | 267 | 99.62% |
| Meridiana | 181 | 98.90% |
| Belavia | 173 | 92.49% |
| Air Arabia Maroc | 160 | 100% |
| Tunisair | 138 | 100% |
| Air Canada Rouge | 135 | 96.27% |
| Medview Airline | 130 | 97.69% |

FIGURE 14 – TRACK KEEPING PERFORMANCE IN 2017

| Month | Total | | | Westerly | | | Easterly | | |
|---|---|---|---|---|---|---|---|---|---|
| | Deviations | Departures | % Deviations | Deviations | Departures | % Deviations | Deviations | Departures | % Deviations |
| **Jan-17** | 92 | 9822 | 0.94% | 80 | 5570 | 1.44% | 12 | 4252 | 0.28% |
| **Feb-17** | 166 | 9711 | 1.71% | 162 | 6443 | 2.51% | 4 | 3268 | 0.12% |
| **Mar-17** | 274 | 11102 | 2.47% | 270 | 8853 | 3.05% | 4 | 2249 | 0.18% |
| **Apr-17** | 146 | 11862 | 1.23% | 130 | 9553 | 1.36% | 16 | 2309 | 0.69% |
| **May-17** | 216 | 13157 | 1.64% | 198 | 6344 | 3.12% | 18 | 6813 | 0.26% |
| **Jun-17** | 291 | 13395 | 2.17% | 275 | 10843 | 2.54% | 16 | 2552 | 0.63% |
| **Jul-17** | 355 | 14029 | 2.53% | 340 | 11681 | 2.91% | 15 | 2348 | 0.64% |
| **Aug-17** | 325 | 14202 | 2.29% | 318 | 11368 | 2.80% | 7 | 2834 | 0.25% |
| **Sep-17** | 283 | 13604 | 2.08% | 266 | 10834 | 2.46% | 17 | 2770 | 0.61% |
| **Oct-17** | 273 | 12547 | 2.18% | 269 | 11577 | 2.32% | 4 | 970 | 0.41% |
| **Nov-17** | 195 | 9288 | 2.10% | 194 | 8832 | 2.20% | 1 | 456 | 0.22% |
| **Dec-17** | 155 | 10234 | 1.51% | 154 | 9478 | 1.62% | 1 | 756 | 0.13% |

FIGURE 15 – TRACK KEEPING PERFORMANCE BY MONTH IN 2017



# 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 is measured each month and is consistently close to 100% for most months.

**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.

**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 will be 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. There are also plans to construct a new Boeing hangar at the airport.

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 2017 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 2017 PER MONTH

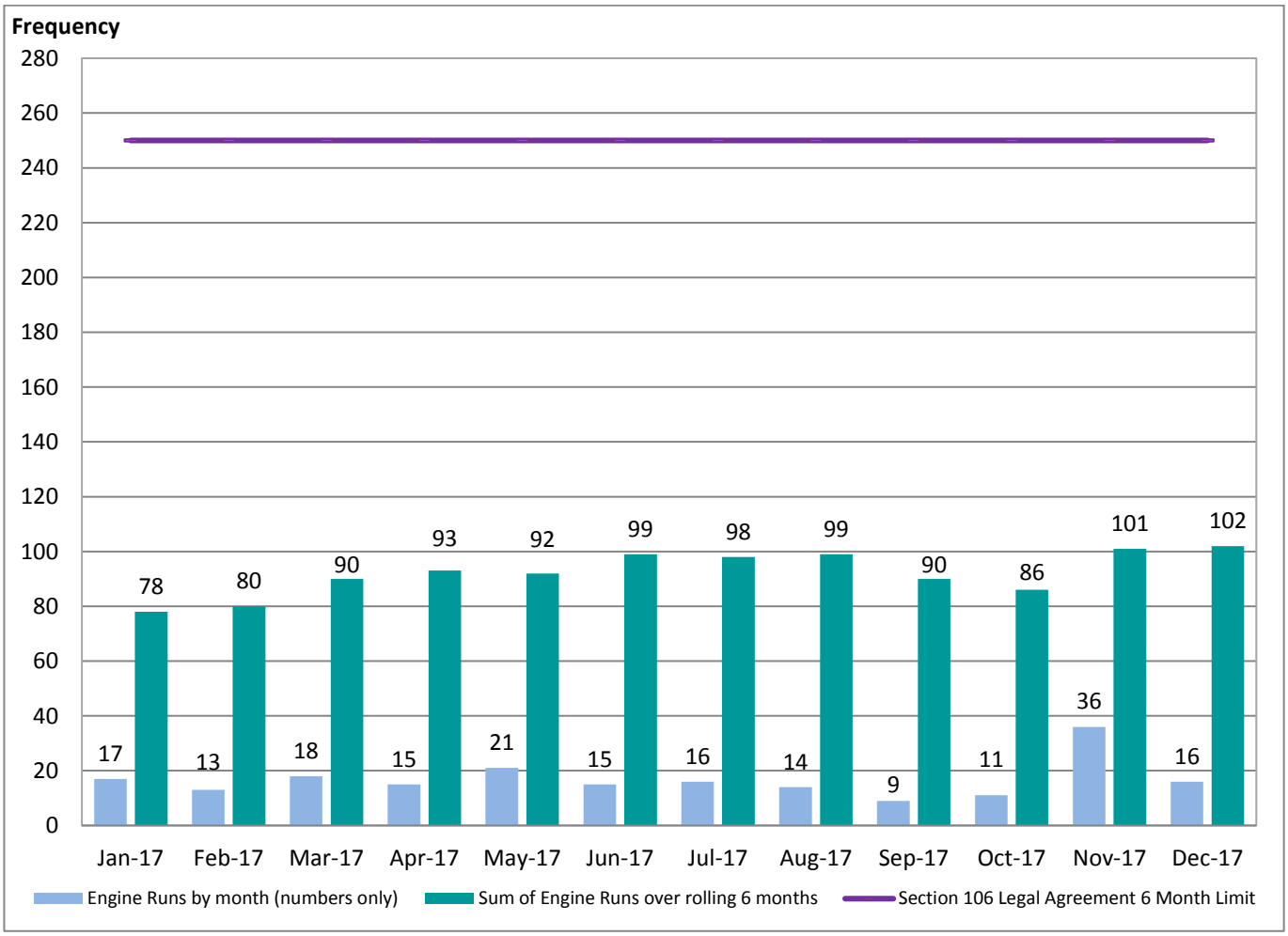
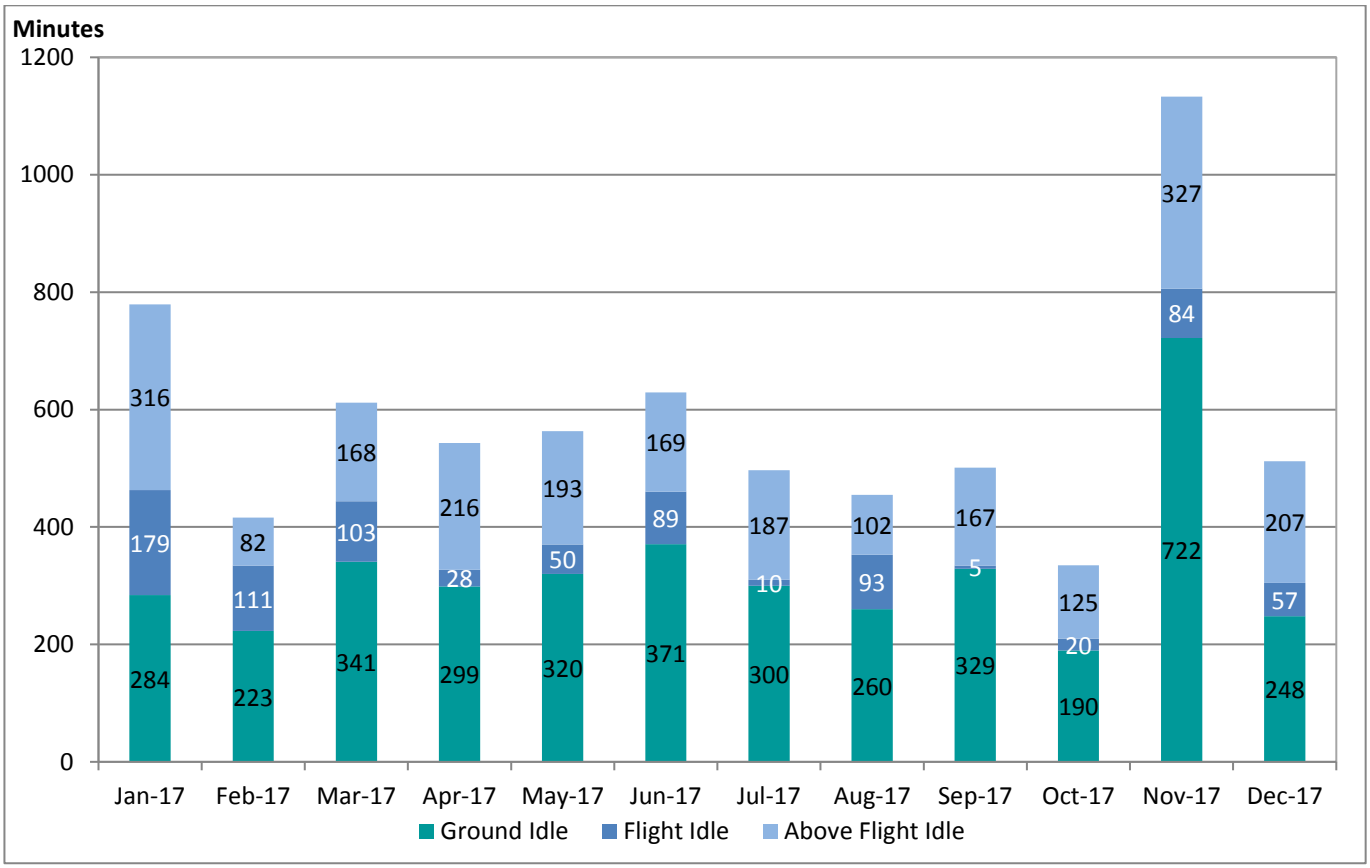


FIGURE 17 - THE ENGINE RUNNING DURATIONS PER MONTH IN 2017




## AUXILIARY AND GROUND POWER UNITS

An Auxiliary Power Unit (APU) is a device on an aircraft that provides energy for functions other than propulsion. 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 are small jet engines normally located in the tail of an aircraft. These provide electrical power to the aircraft's systems when the main engines are off. APU's 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 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. 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 2017

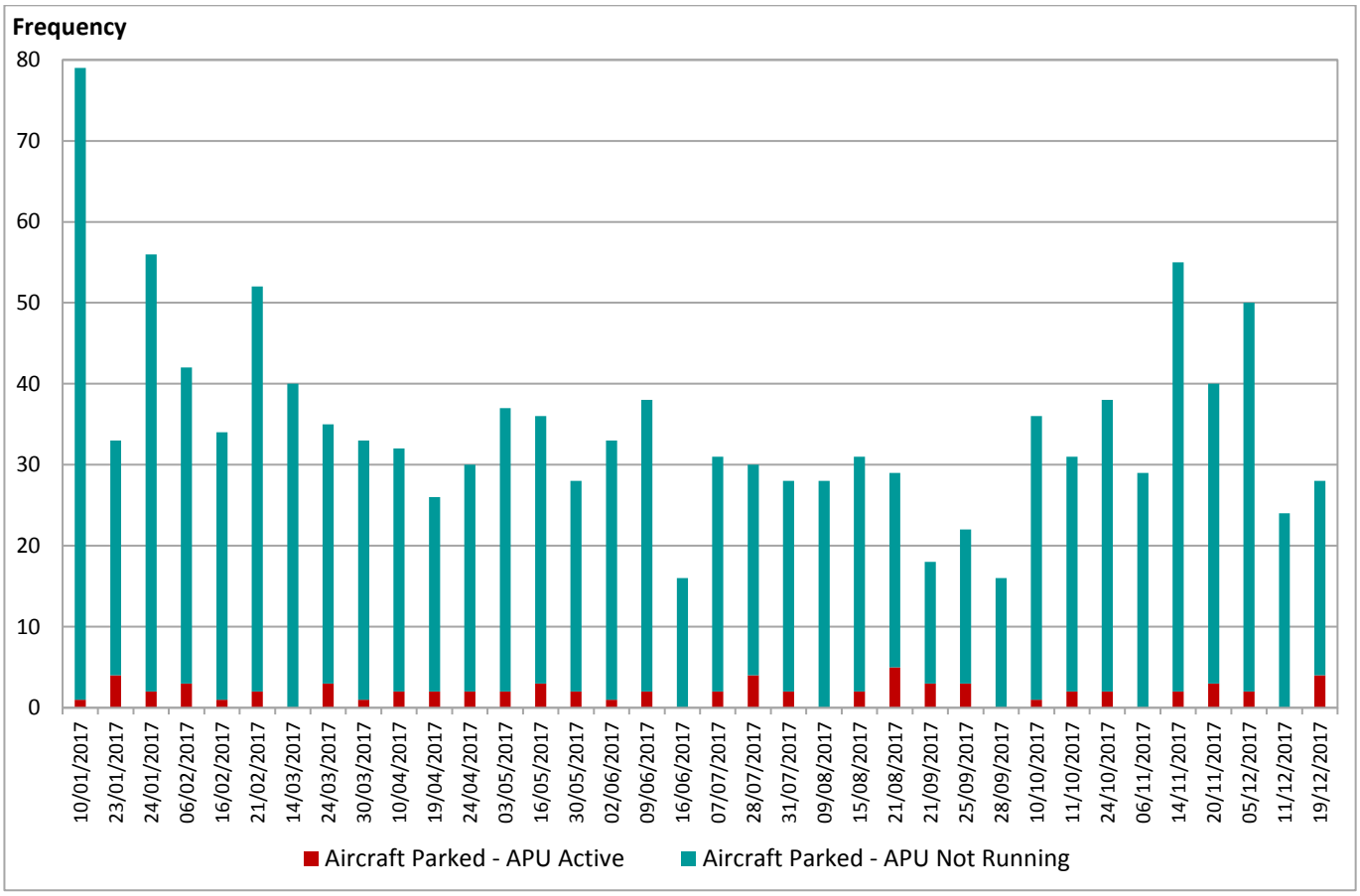
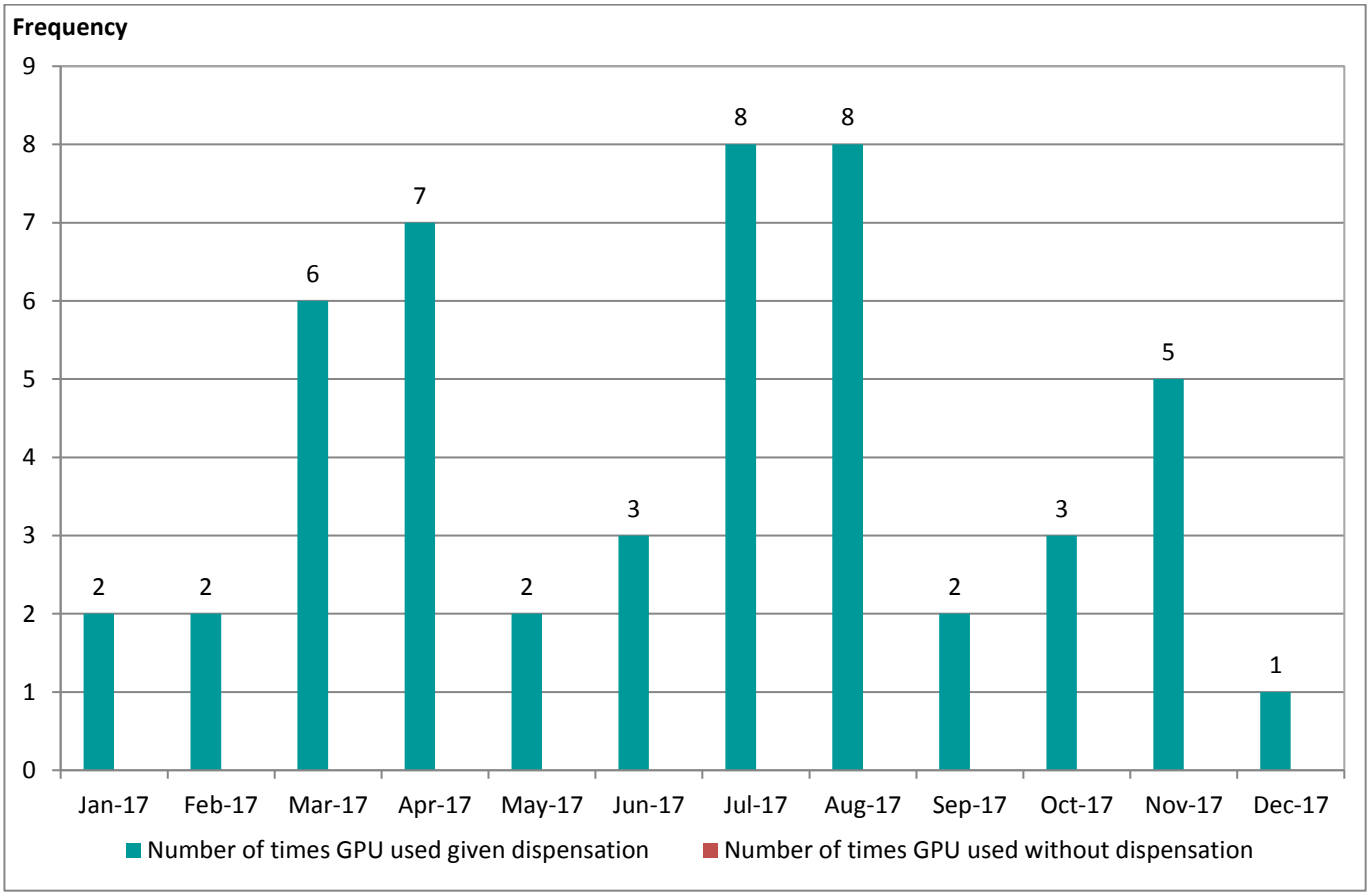



FIGURE 19 - THE USE OF GROUND POWER UNITS IN 2017



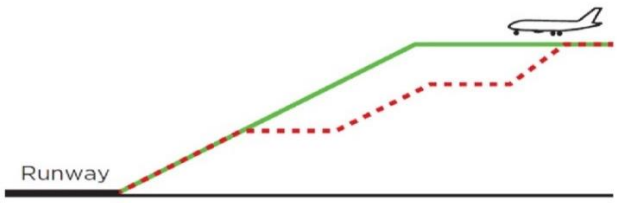
# Arriving aircraft

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).

**Figure 20** below illustrates how this type of approach differs from the traditional stepped approach.

FIGURE 20 – DIAGRAM OF HOW CDO IS PERFORMED




Aircraft engines produce more noise during level flight than in a shallow glide of a CDO and 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, air traffic conditions 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 aircraft 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.

**Figure 21** compares the level of CDO performance by our airline operators for 2017, with our top operators by aircraft movements having above average levels of achievement.

[1] Monarch Airlines ceased operations 2nd October 2017

FIGURE 21 – CDO PERFORMANCE BY AIRLINE 2017

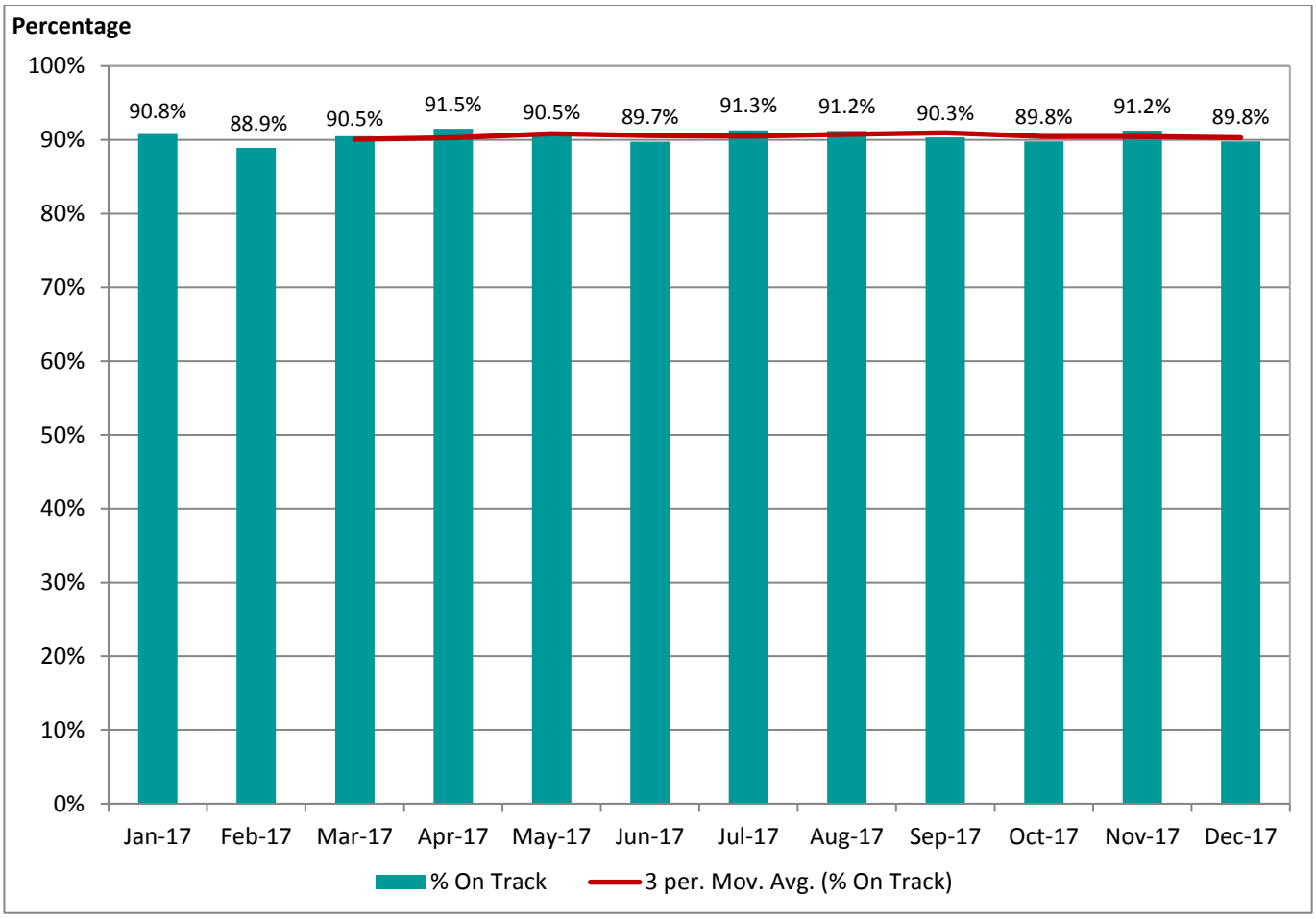
| Airline | Arrivals | CDO Performance |
|---|---|---|
| easyJet | 59881 | 95.31% |
| British Airways | 22878 | 93.46% |
| Norwegian Air | 13384 | 90.97% |
| TUI | 6478 | 95.23% |
| Ryanair | 4939 | 98.34% |
| Monarch Airlines[1] | 4354 | 96.12% |
| Vueling Airlines | 3960 | 73.76% |
| Thomas Cook Airlines | 3590 | 90.33% |
| Aer Lingus | 2250 | 87.02% |
| Virgin Atlantic | 2139 | 93.03% |
| Aurigny Air Services | 2000 | 95.05% |
| easyJet Switzerland | 1494 | 94.11% |
| TAP Portugal | 1242 | 64.70% |
| Emirates Airline | 1101 | 81.83% |
| Turkish Airlines | 1025 | 50.73% |
| Flybe | 964 | 88.49% |
| WestJet | 929 | 74.06% |
| Air Europa | 732 | 52.80% |
| Iberia Express | 723 | 55.05% |
| WOW Air | 691 | 59.33% |
| Air Transat | 679 | 74.96% |
| Ukraine International | 669 | 59.79% |
| AirBaltic | 531 | 61.21% |
| Germania | 496 | 83.67% |
| Travel Service Airlines | 405 | 53.33% |
| Icelandair | 384 | 83.85% |
| Aeroflot | 365 | 42.74% |
| Small Planet Airlines | 359 | 70.75% |
| Royal Air Maroc | 358 | 62.01% |
| Air Malta | 324 | 90.43% |
| Wizz Air | 308 | 68.18% |
| Cathay Pacific | 291 | 72.16% |
| Titan Airways | 290 | 88.85% |
| Enter Air | 268 | 51.87% |
| Meridiana | 181 | 45.30% |
| Belavia | 173 | 37.57% |
| Air Arabia Maroc | 160 | 36.88% |
| Tunisair | 138 | 29.71% |
| Air Canada Rouge | 135 | 59.40% |
| Medview Airline | 134 | 29.46% |

## 24 HOUR CDO ACHIEVEMENT

FIGURE 22 – THE SUMMARY OF CDO ACHIEVEMENT FOR THE 24 HOUR PERIOD IN 2017

| Month | All Arrivals | | | 08 Easterly Arrivals | | | 26 Westerly Arrivals | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Non CDO | % CDO | Total | Non CDO | % CDO | Total | Non CDO | % CDO |
| **Jan-17** | 8786 | 901 | 90.79% | 4235 | 328 | 92.26% | 5551 | 573 | 89.68% |
| **Feb-17** | 9675 | 1074 | 88.90% | 3138 | 359 | 88.56% | 6537 | 715 | 89.06% |
| **Mar-17** | 11034 | 1049 | 90.49% | 2282 | 229 | 89.96% | 8752 | 820 | 90.63% |
| **Apr-17** | 11795 | 1006 | 91.47% | 2373 | 205 | 91.36% | 9422 | 801 | 91.50% |
| **May-17** | 13139 | 1252 | 90.47% | 6768 | 664 | 90.19% | 6371 | 588 | 90.77% |
| **Jun-17** | 13414 | 1377 | 89.73% | 2554 | 227 | 91.11% | 10860 | 1150 | 89.41% |
| **Jul-17** | 14055 | 1223 | 91.30% | 2268 | 236 | 89.59% | 11787 | 987 | 91.63% |
| **Aug-17** | 14198 | 1249 | 91.20% | 2776 | 284 | 89.77% | 11422 | 965 | 91.55% |
| **Sep-17** | 13612 | 1316 | 90.33% | 2771 | 223 | 91.95% | 10841 | 1093 | 89.92% |
| **Oct-17** | 12582 | 1286 | 89.78% | 959 | 69 | 92.81% | 11623 | 1217 | 89.53% |
| **Nov-17** | 9279 | 813 | 91.24% | 427 | 39 | 90.87% | 8852 | 774 | 91.26% |
| **Dec-17** | 10252 | 1050 | 89.76% | 760 | 115 | 84.87% | 9492 | 935 | 90.15% |

FIGURE 23 – CDO ACHIEVEMENT DURING THE 24 HOUR PERIOD PER MONTH WITH A TRENDLINE

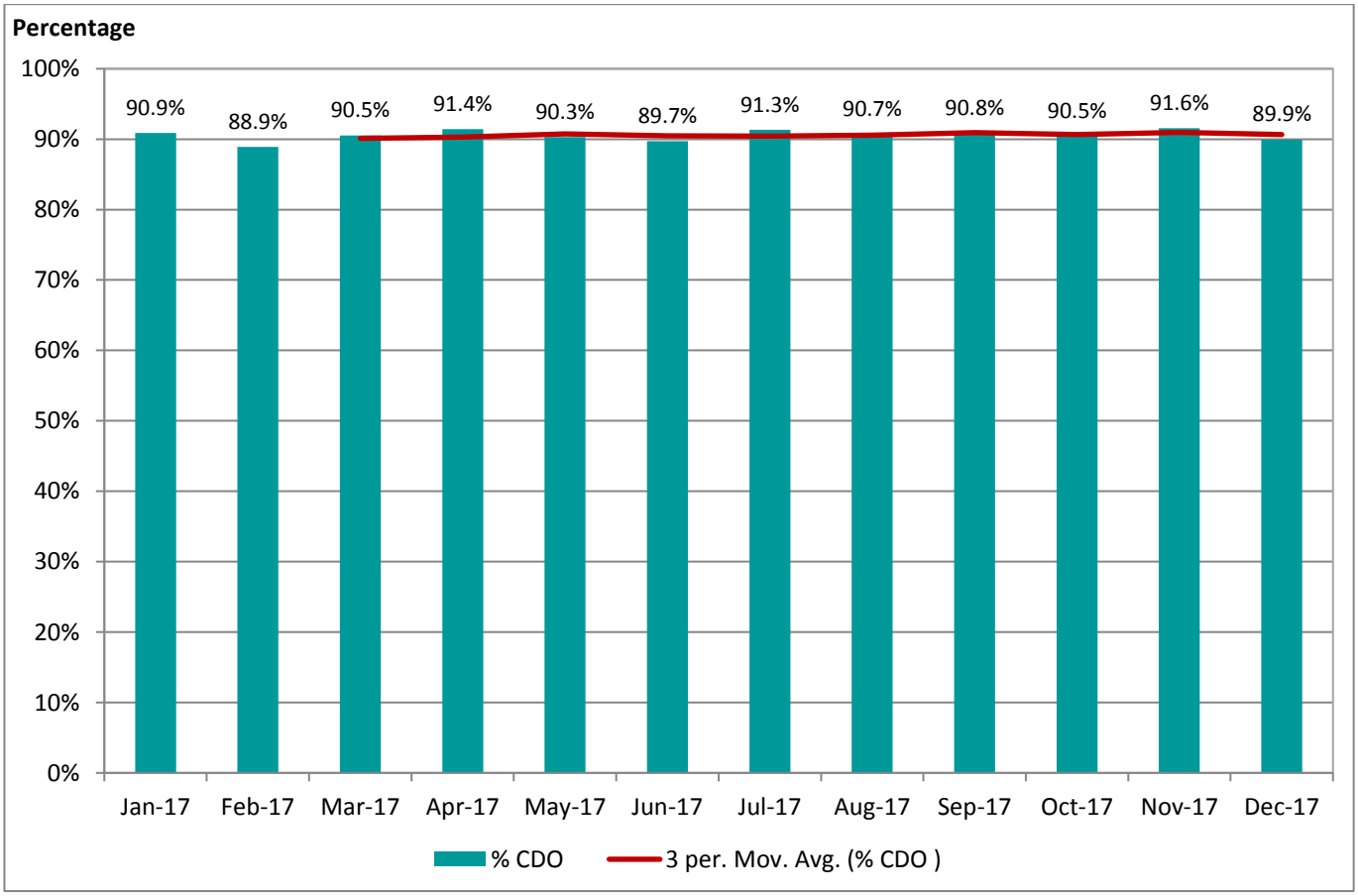


## DAYTIME AND SHOULDER PERIOD CDO ACHIEVEMENT (0600-2330)

FIGURE 24 - THE SUMMARY OF CDO ACHIEVEMENT FOR THE DAYTIME AND SHOULDER PERIOD IN 2017

| | All Arrivals | | | 08 Easterly Arrivals | | | 26 Westerly Arrivals | | |
|---|---|---|---|---|---|---|---|---|---|
| Month | Total | Non CDO | % CDO | Total | Non CDO | % CDO | Total | Non CDO | % CDO |
| Jan-17 | 9395 | 855 | 90.90% | 4085 | 317 | 92.24% | 5310 | 538 | 89.87% |
| Feb-17 | 9305 | 1031 | 88.92% | 3017 | 342 | 88.66% | 6288 | 689 | 89.04% |
| Mar-17 | 10587 | 1004 | 90.52% | 2157 | 225 | 89.57% | 8430 | 779 | 90.76% |
| Apr-17 | 11016 | 943 | 91.44% | 2159 | 193 | 91.06% | 8857 | 750 | 91.53% |
| May-17 | 11873 | 1154 | 90.28% | 6104 | 600 | 90.17% | 5769 | 554 | 90.40% |
| Jun-17 | 11902 | 1222 | 89.73% | 2288 | 204 | 91.08% | 9614 | 1018 | 89.41% |
| Jul-17 | 12221 | 1061 | 91.32% | 2016 | 199 | 90.13% | 10205 | 862 | 91.55% |
| Aug-17 | 12483 | 1164 | 90.68% | 2446 | 263 | 89.25% | 10037 | 901 | 91.02% |
| Sep-17 | 11879 | 1089 | 90.83% | 2381 | 181 | 92.40% | 9498 | 908 | 90.44% |
| Oct-17 | 11369 | 1082 | 90.48% | 909 | 65 | 92.85% | 10460 | 1017 | 90.28% |
| Nov-17 | 9012 | 760 | 91.57% | 415 | 37 | 91.08% | 8597 | 723 | 91.59% |
| Dec-17 | 9879 | 993 | 89.95% | 711 | 108 | 84.81% | 9168 | 885 | 90.35% |

FIGURE 25 - CDO ACHIEVEMENT DURING THE DAYTIME AND SHOULDER PERIOD PER MONTH WITH A TRENDLINE

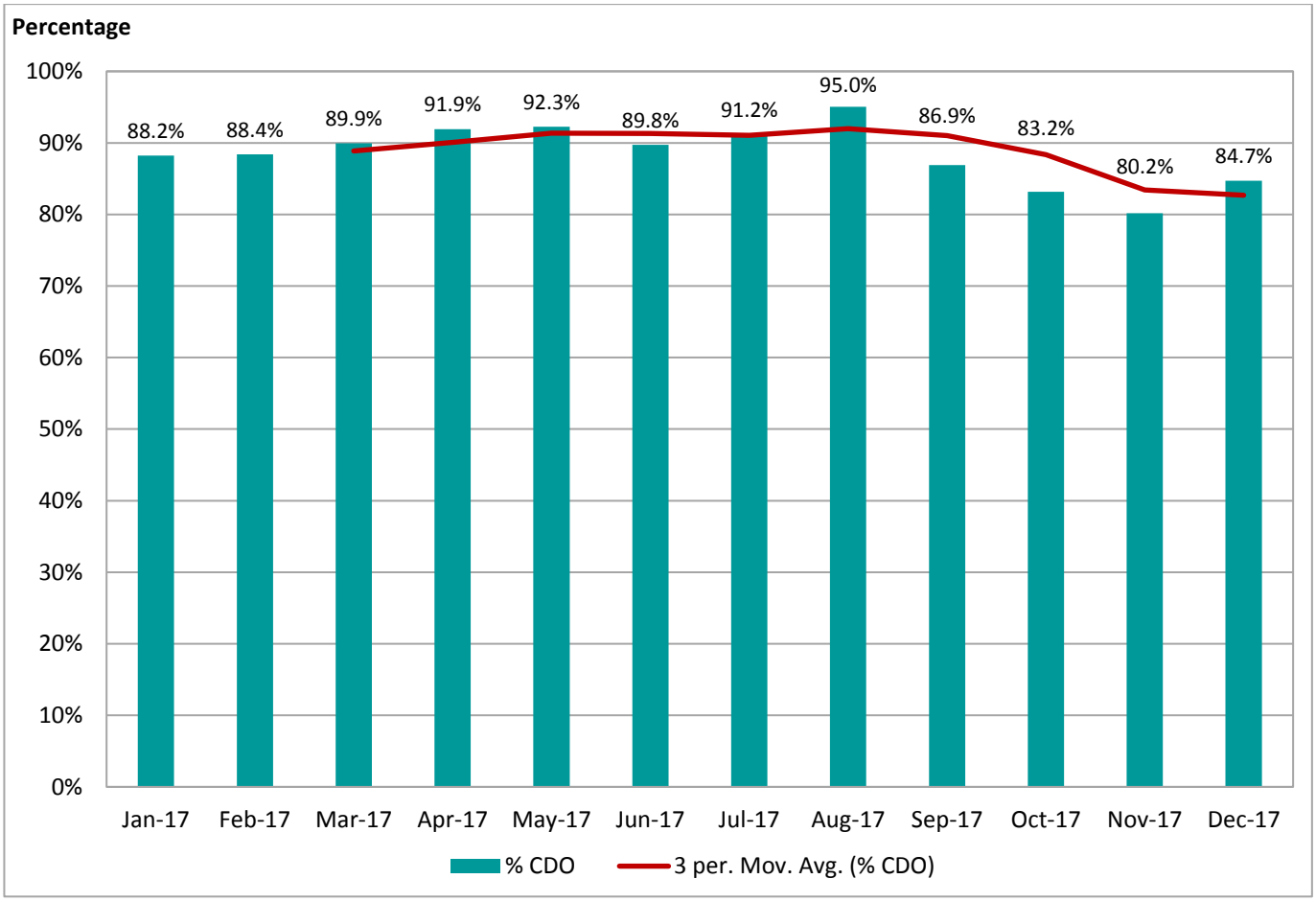


## CORE NIGHT CDO ACHIEVEMENT (2330-0600)

FIGURE 26 - THE SUMMARY OF CDO ACHIEVEMENT FOR THE CORE NIGHT PERIOD IN 2017

| Month | All Arrivals | | | 08 Easterly Arrivals | | | 26 Westerly Arrivals | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Non CDO | % CDO | Total | Non CDO | % CDO | Total | Non CDO | % CDO |
| **Jan-17** | 391 | 46 | 88.24% | 150 | 11 | 92.67% | 241 | 35 | 85.48% |
| **Feb-17** | 370 | 43 | 88.38% | 121 | 17 | 85.95% | 249 | 26 | 89.56% |
| **Mar-17** | 447 | 45 | 89.93% | 125 | 4 | 96.80% | 322 | 41 | 87.27% |
| **Apr-17** | 779 | 63 | 91.91% | 214 | 12 | 94.39% | 565 | 51 | 90.97% |
| **May-17** | 1266 | 98 | 92.26% | 664 | 64 | 90.36% | 602 | 34 | 94.35% |
| **Jun-17** | 1512 | 155 | 89.75% | 266 | 23 | 91.35% | 1246 | 132 | 89.41% |
| **Jul-17** | 1834 | 162 | 91.17% | 252 | 37 | 85.32% | 1582 | 125 | 92.10% |
| **Aug-17** | 1715 | 85 | 95.04% | 330 | 21 | 93.64% | 1385 | 64 | 95.38% |
| **Sep-17** | 1733 | 227 | 86.90% | 390 | 42 | 89.23% | 1343 | 185 | 86.22% |
| **Oct-17** | 1213 | 204 | 83.18% | 50 | 4 | 92.00% | 1163 | 200 | 82.80% |
| **Nov-17** | 267 | 53 | 80.15% | 12 | 2 | 83.33% | 255 | 51 | 80.00% |
| **Dec-17** | 373 | 57 | 84.72% | 49 | 7 | 85.71% | 324 | 50 | 84.57% |

FIGURE 27 - CDO ACHIEVEMENT DURING THE CORE NIGHT PERIOD PER MONTH WITH A TRENDLINE



# Operations at Night

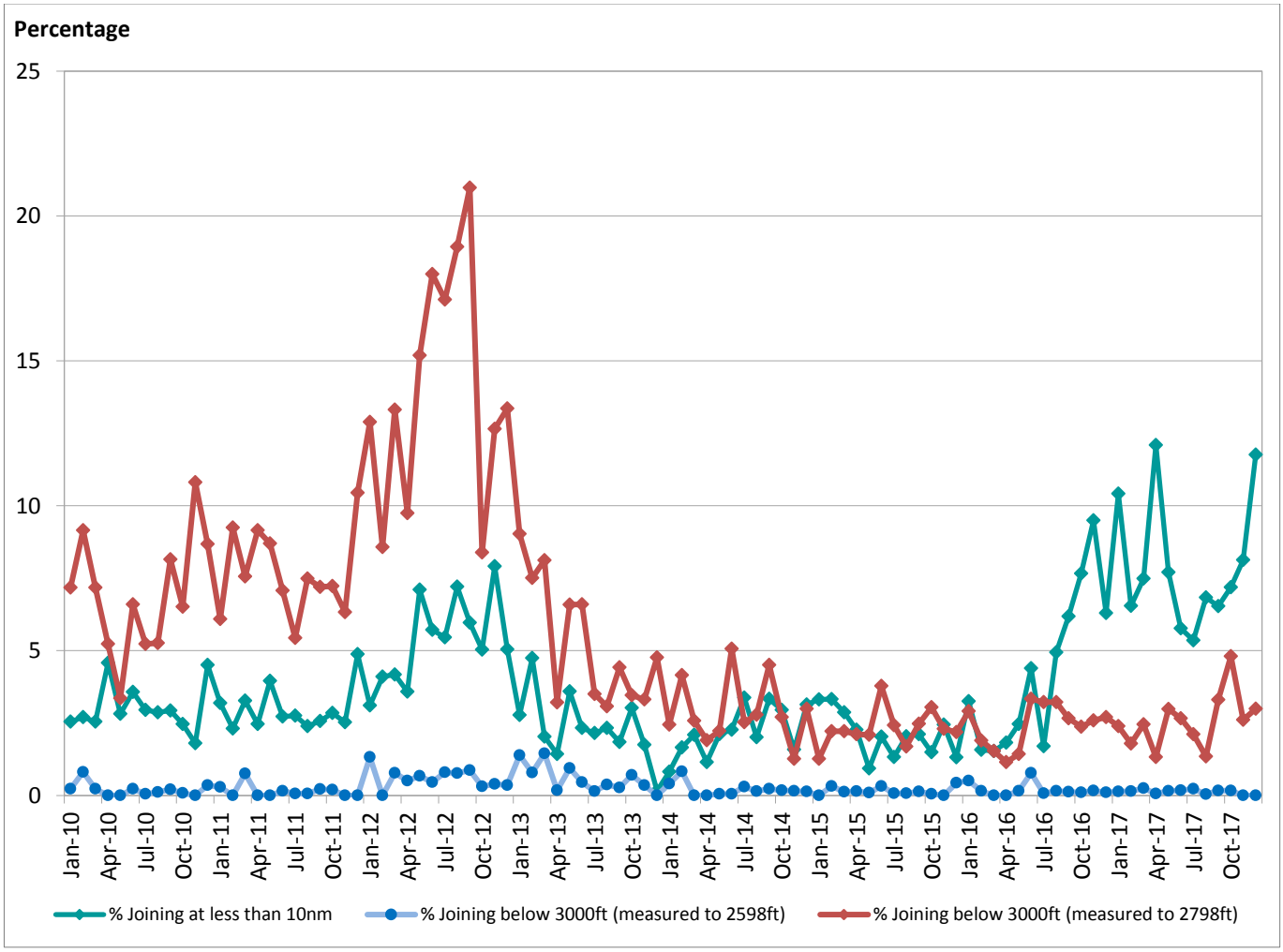
## NIGHT-TIME JOINING POINT

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.

FIGURE 28 - THE NIGHT TIME JOINING POINTS (2010 – 2017)




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 new 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 will see a reduction in the QC limit and a new QC value of 0.125 applied to some aircraft which are currently exempt. As of October 2017, all aircraft movements have counted towards the night quota limit, including those previously exempt which will carry a QC value of zero. 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 29** 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 29 - THE CLASSIFICATION OF QC VALUES

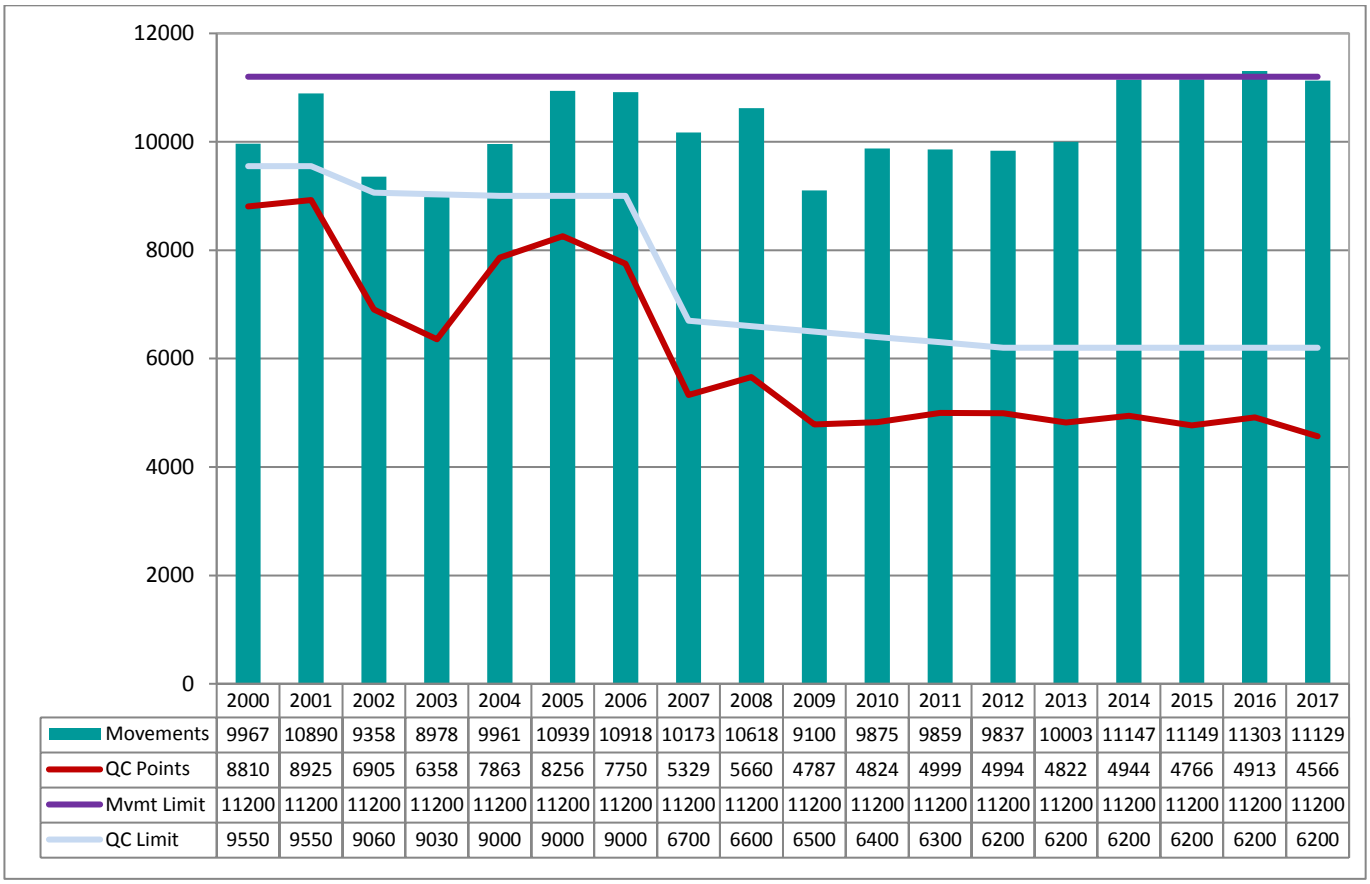
| Certificated noise level (EPNdB) | Quota count |
|---|---|
| Less than 84 | 0 |
| 84 to 86.9 | 0.25 |
| 87 to 89.9 | 0.5 |
| 90 to 92.9 | 1 |
| 93 to 95.9 | 2 |
| 96 to 98.9 | 4 |
| 99 to 101.9 | 8 |
| Greater than 101.9 | 16 |

FIGURE 30 - 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 31 – A SUMMARY OF NIGHT QUOTA QC MOVEMENT USAGE FOR THE SUMMER SEASON 2000-2017




| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movements | 9967 | 10890 | 9358 | 8978 | 9961 | 10939 | 10918 | 10173 | 10618 | 9100 | 9875 | 9859 | 9837 | 10003 | 11147 | 11149 | 11303 | 11129 |
| QC Points | 8810 | 8925 | 6905 | 6358 | 7863 | 8256 | 7750 | 5329 | 5660 | 4787 | 4824 | 4999 | 4994 | 4822 | 4944 | 4766 | 4913 | 4566 |
| Mvmt Limit | 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 |

## 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 25 QC4 aircraft which operated during this period in the summer season. These aircraft were not scheduled but were delayed into the night period.

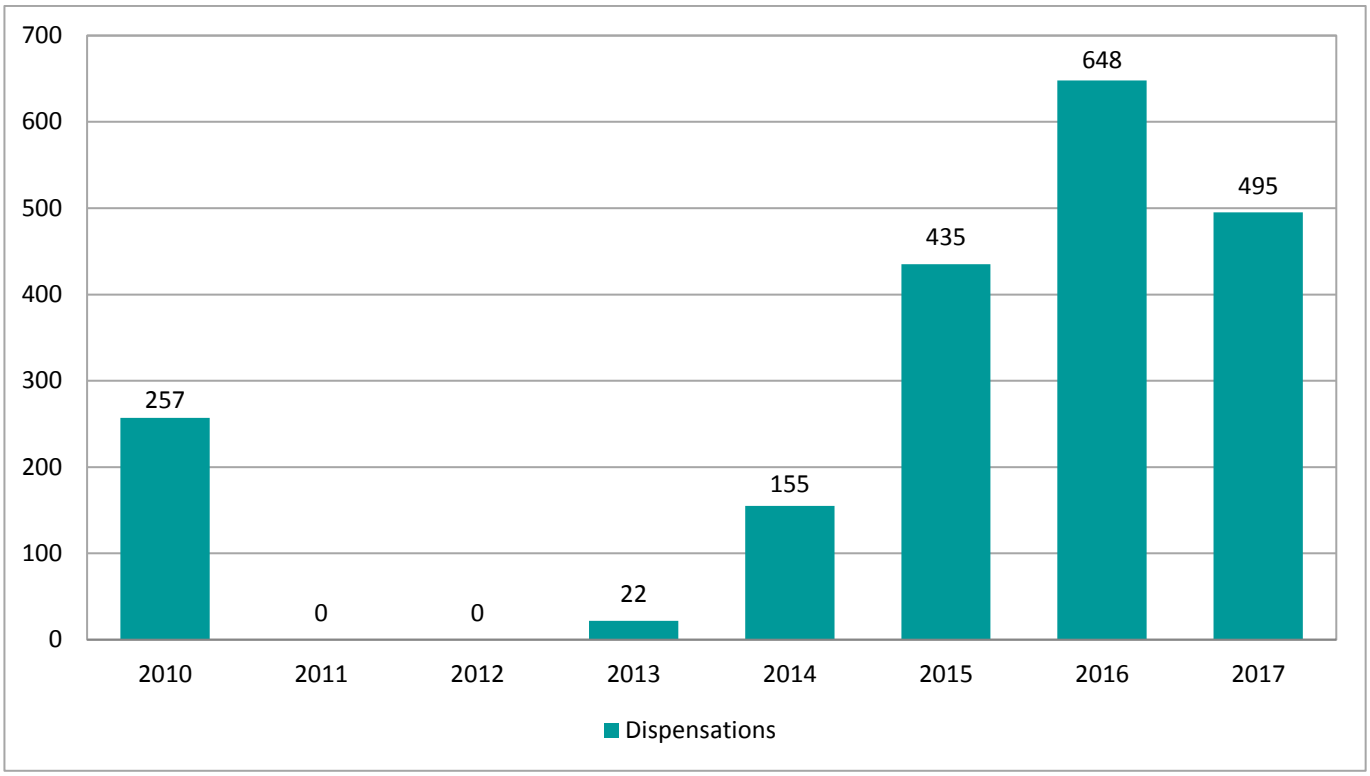
Aircraft with a QC0.0 classification are those which for noise classification purposes were treated as exempt from the night flying regulations up until the end of the summer season in 2017. Examples of this aircraft type are some small executive jets and small propeller aircraft. Very few aircraft fall under this category at Gatwick. Since the beginning of the winter season, under new DfT guidelines, aircraft types with a QC0.0 classification are now included in the night movement count.

## 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 32 – THE NUMBER OF DISPENSATIONS GRANTED BY THE DfT (2010 – 2017)




## REASONS FOR DISPENSATIONS 2017

FIGURE 33 – A SUMMARY OF THE REASONS FOR GIVEN DISPENSATIONS DURING 2017

| Reason | Frequency |
|---|---|
| Disruption caused by severe weather conditions | 285 |
| Closure of main runway due to Air Canada Rouge burst tyre on departure on 17th July 2017. | 73 |
| French ATC strikes during March, September and October 2017 | 64 |
| Disruption caused by low visibility conditions | 57 |
| Closure of main runway due to a drone observation on 2nd July 2017 | 6 |
| Disruption to flights caused by Hurricane Irma in September 2017 | 4 |
| Knock on delays caused by the runway closure at TFS Airport on 2nd June 2017 | 4 |
| Medical Emergencies on the 27th and 28th May 2017 | 2 |

FIGURE 34 - THE QUOTA COUNT USED DURING THE SUMMER SEASON 2004 - 2017

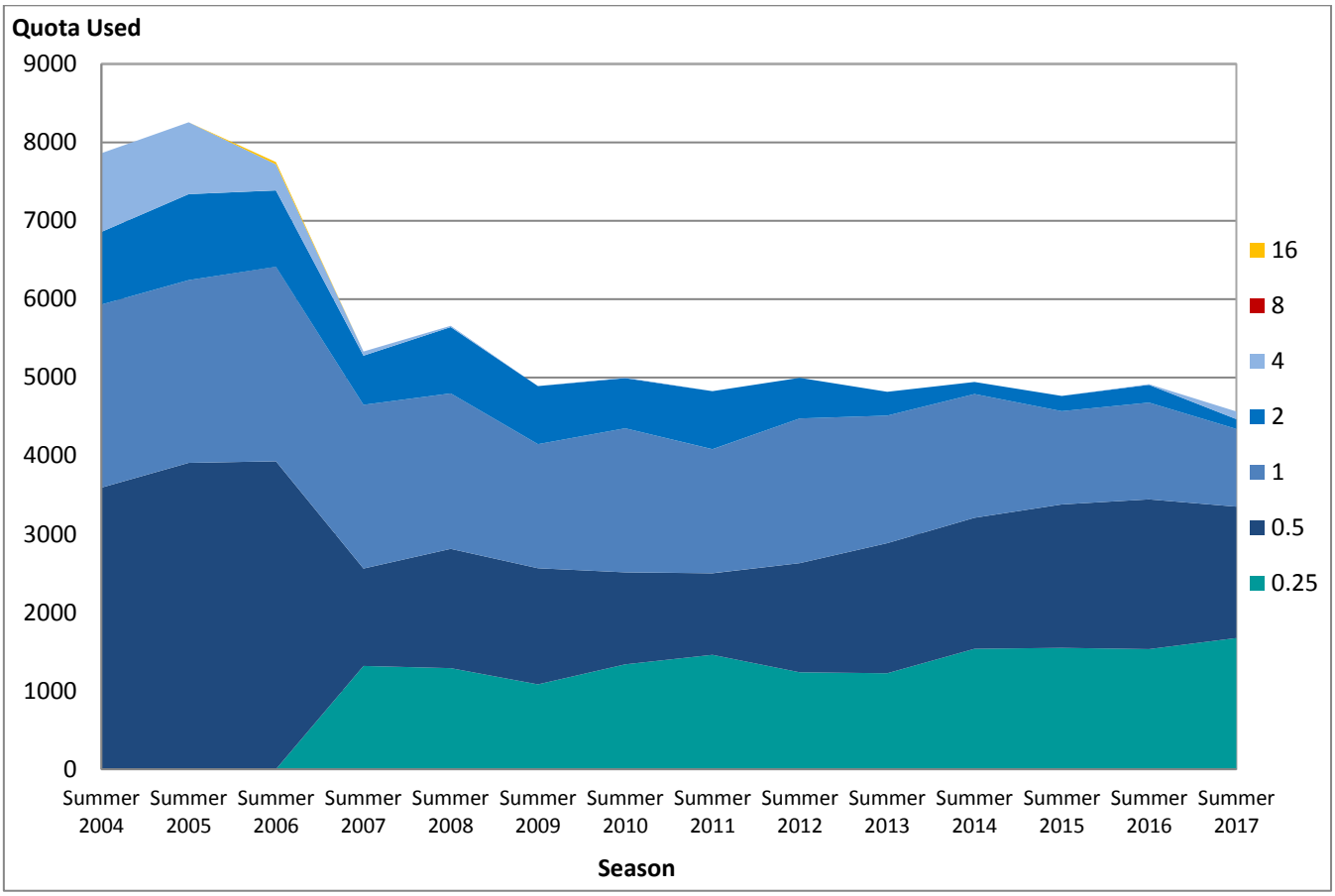
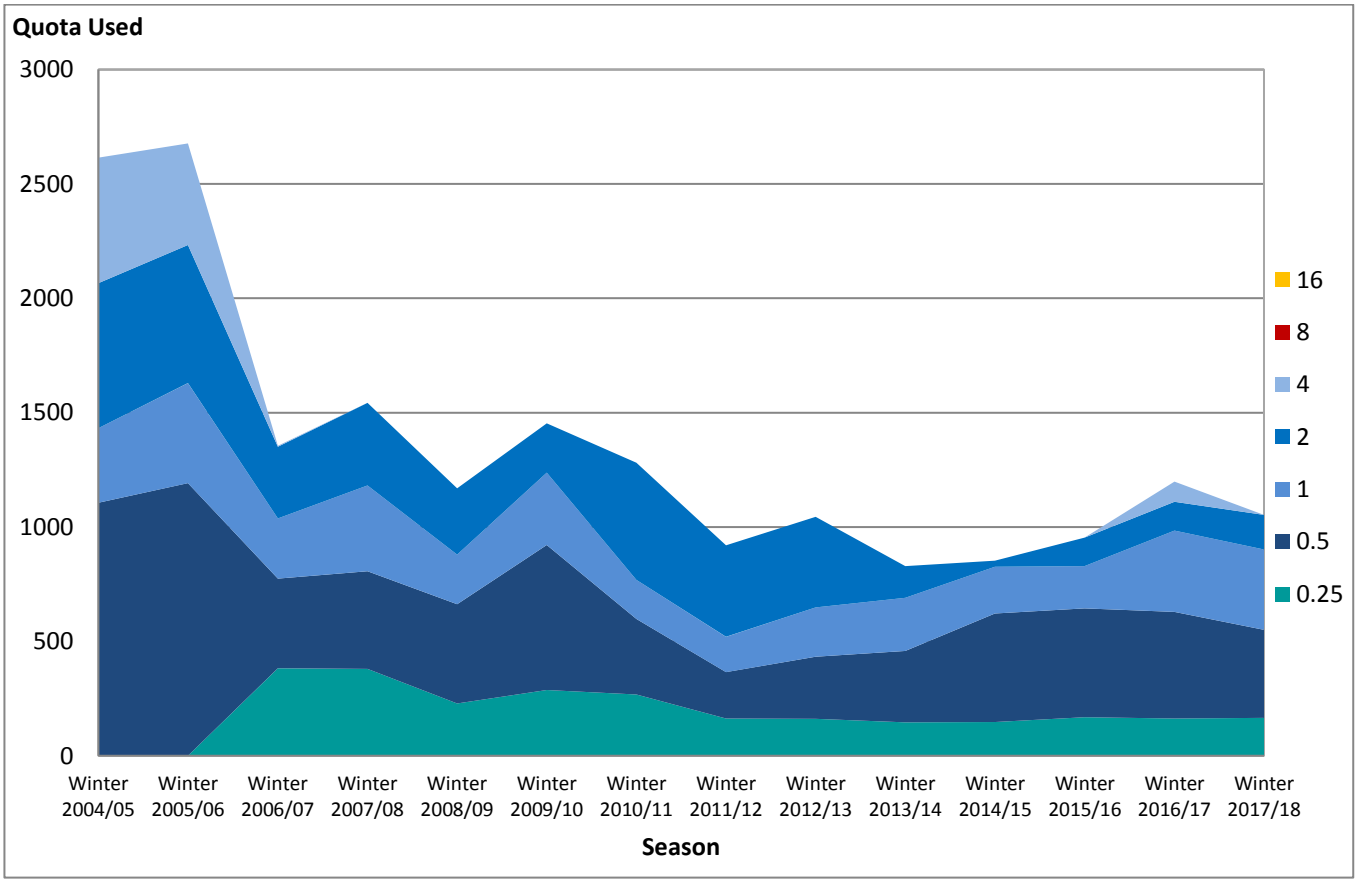



FIGURE 35 - THE QUOTA COUNT USED DURING THE WINTER SEASON 2004/5 – 2017/18



# Aircraft Noise and Community 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 36 - 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 following noise 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 5 decibels or more, a fine of £1,000 is applied.

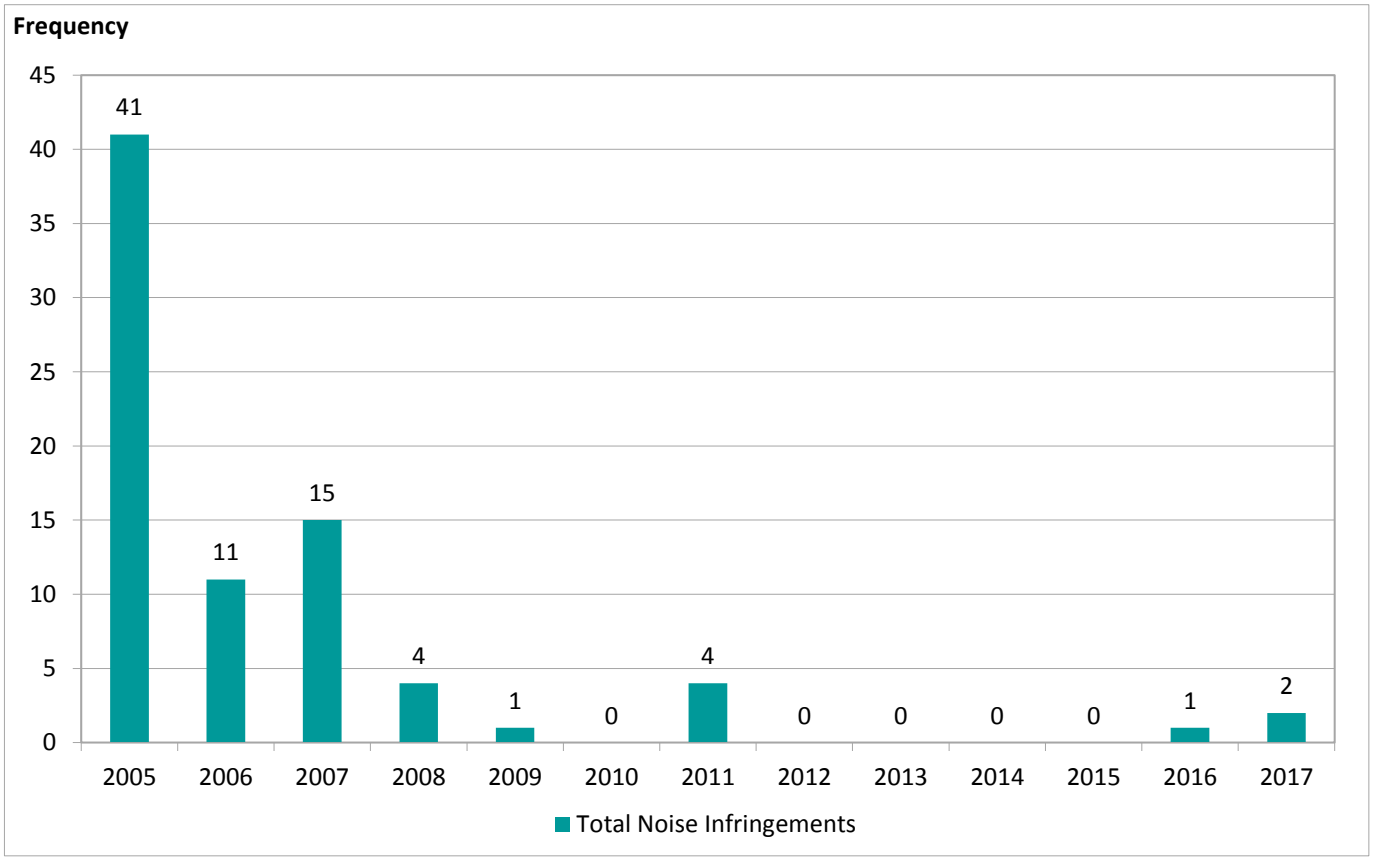
All proceeds from noise fines are passed to the independently run Gatwick Airport Community Trust (GACT). The trust also receives over £200,000 per annum from the airport and distributes grants to local charities and community projects.

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

During 2017, there were two night noise infringements on the 3rd and 6th April both caused by a Medview Airlines Boeing 747-412 series. The airline has been issued with a fine of £1500 for breaching the limits on both occasions. Medview Airlines have suspended operations at Gatwick Airport at the end of 2017.

Despite this, 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 and A320 Neo family of aircraft.

FIGURE 37 - THE GRAPH BELOW SHOWS THE DEPARTURE NOISE INFRINGEMENTS PER YEAR 2005 – 2017



## 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 during the night period.

To show where the different average noise levels are located around the airport, the Government has developed maps showing 'noise contours'. **Figure 39** is 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.

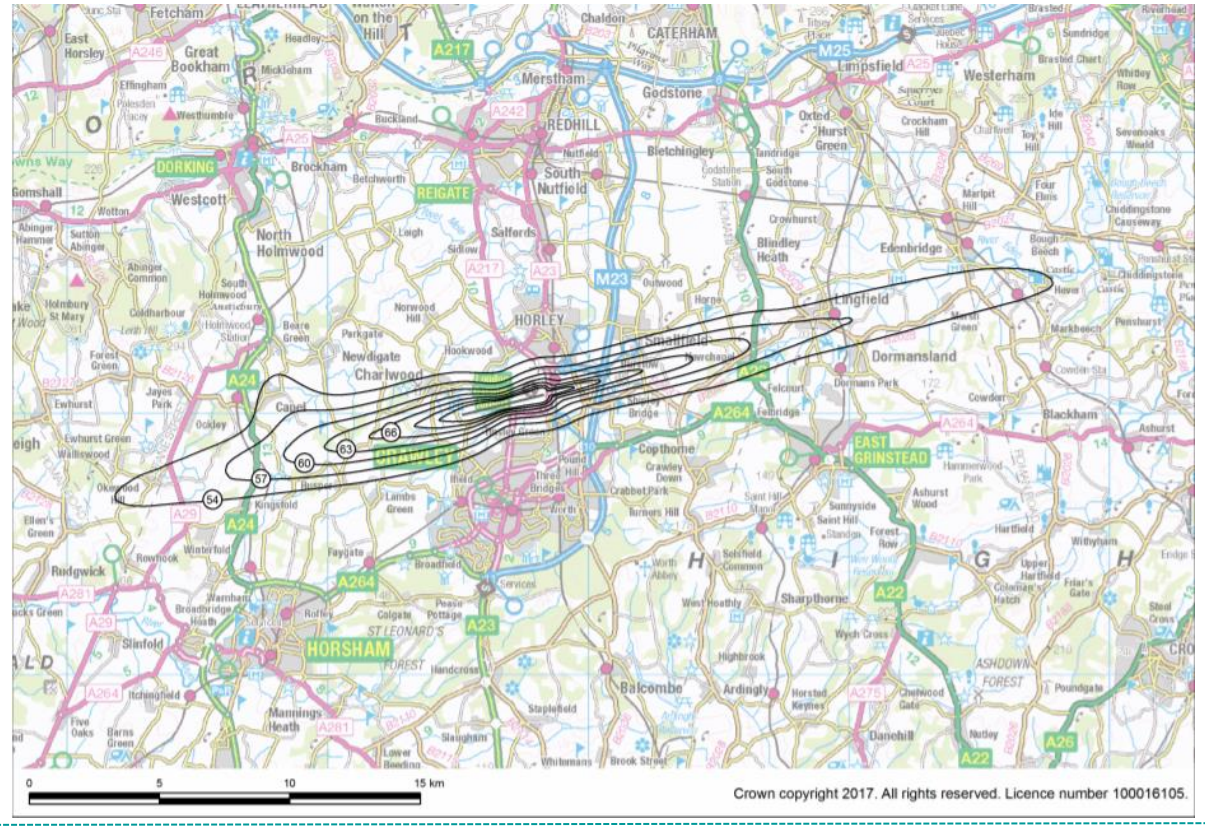
The 57 dBA Leq day contour area for 2016 based on the actual runway modal split was calculated to be 44.2km$^2$, 3% higher than in 2015. The population enclosed within the actual 57 dBA Leq day contour increased by 14% to 4,150. This is due to population growth and can also be affected by the split in runway direction.

The 2017 noise contours have not been completed at the time of publication.

FIGURE 38 - THE GATWICK DAY STANDARD CONTOURS – AREAS AND POPULATIONS FOR 2015 AND 2016

| Leq (dBA) | 2015 Area (km$^2$) | 2016 Area (km$^2$) | Area change (%) | 2015 Population | 2016 Population | Population change (%) |
|---|---|---|---|---|---|---|
| > 57 | 42.8 | 44.2 | 3% | 3,350 | 4,150 | 14% |
| > 60 | 24.2 | 25.1 | 4% | 1,550 | 1,550 | 0% |
| > 63 | 13 | 13.7 | 5% | 550 | 550 | 0% |
| > 66 | 6.7 | 7.2 | 7% | 350 | 350 | 0% |
| > 69 | 3.5 | 3.8 | 9% | 150 | 150 | 0% |
| > 72 | 2 | 2.1 | 5% | 0 | 0 | 0% |

FIGURE 39 - THE NOISE EXPOSURE CONTOURS 2016



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## GATWICK NOISE MONITORING GROUP

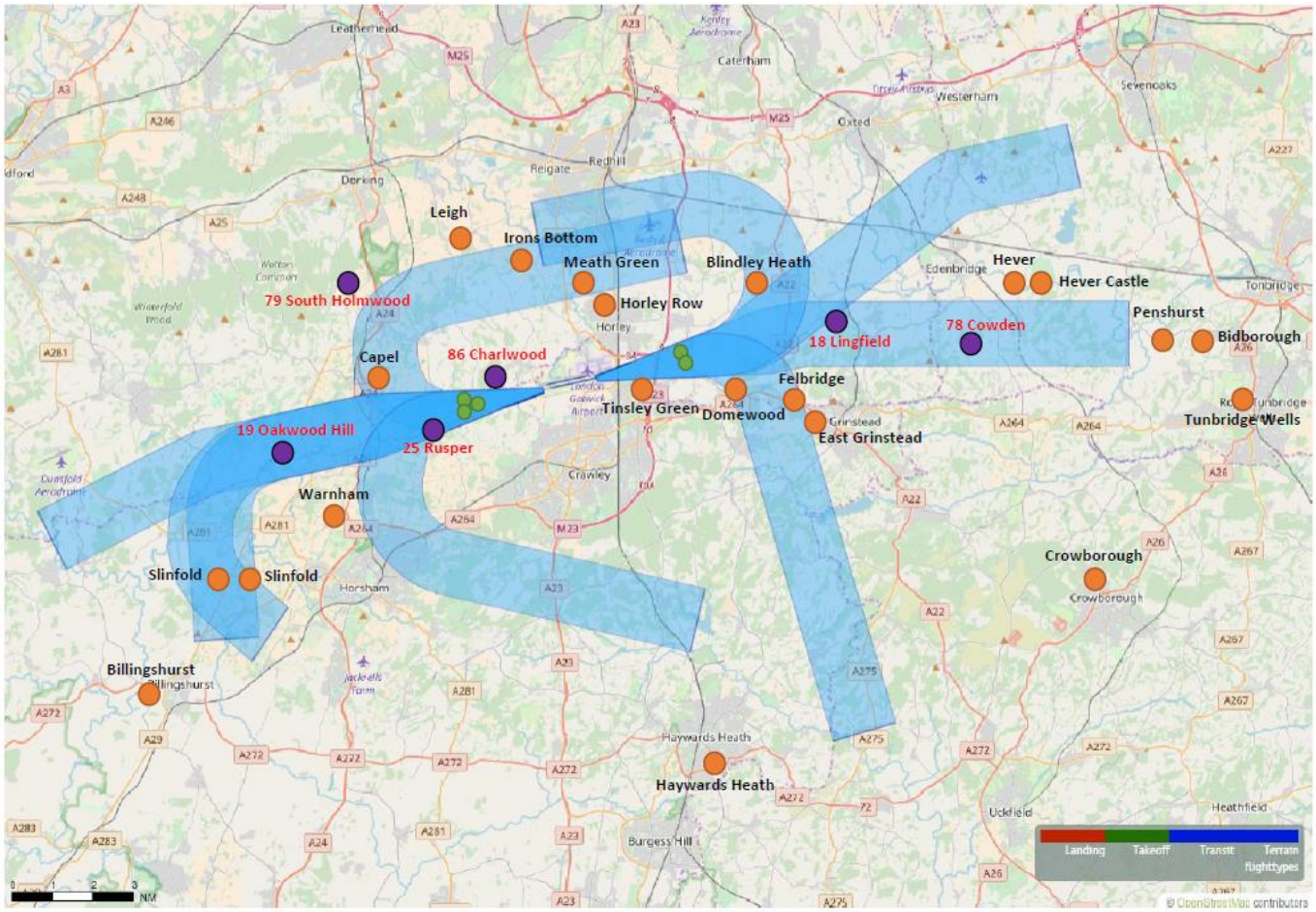
Gatwick Airport funds and co-ordinates a community noise monitoring programme in conjunction with local Environmental Health Officers and the Airport's Consultative Committee. Noise monitors are located throughout local communities in Sussex, Surrey and Kent in order to develop an understanding of the 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/aircraftnoiseandairspace** and also via Gatwick Noise Lab where historical data can be viewed and downloaded at: **http://noiselab.casper.aero/lgw/**

**Figure 40** 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 2017, a detailed noise study was commissioned for East Grinstead which is available on the Gatwick website.

FIGURE 40 - THE LOCATION OF THE CURRENT AND HISTORICAL NOISE MONITORS




Location of current and historical noise monitors and NPRs – February 2018 Current sites Historical sites Fixed sites

# 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.

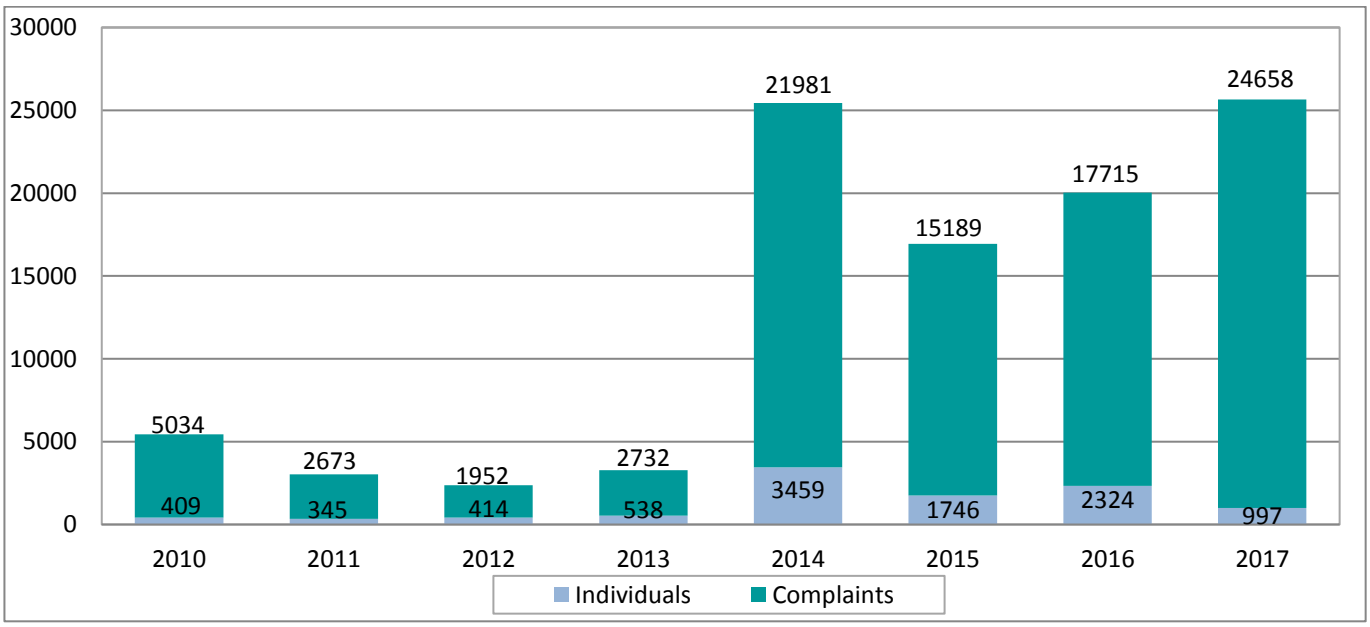
In order to provide public protection from aircraft noise, an 'annoyance threshold' currently exists within UK policy. The time period for noise exposure used is an average summer day, from 16th June to 15th September and from 7am to 11pm to reflect that there is a difference in terms of daytime and 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 41** 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 UK study on aviation noise was the Survey of Noise Attitudes (SONA 2014) published by the CAA.

FIGURE 41 - THE NUMBER OF INDIVIDUAL COMPLAINANTS AND RECORDED COMPLAINT NUMBERS



## COMPLAINANT LOCATIONS

FIGURE 42 - THE LOCATIONS OF COMPLAINTS RECORDED IN 2017

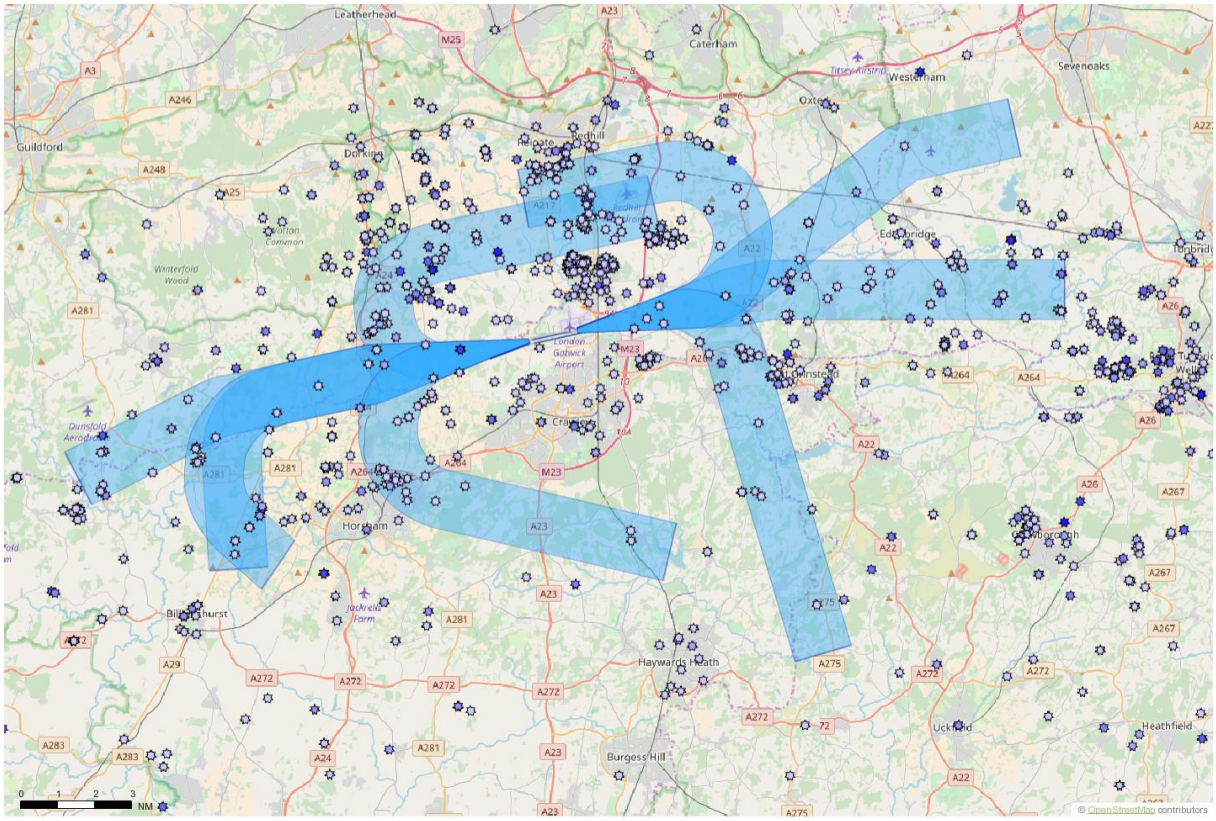



FIGURE 43 – THE LOCATIONS OF GATWICK NOISE COMPLAINTS RECORDED ACROSS THE SOUTH EAST IN 2017

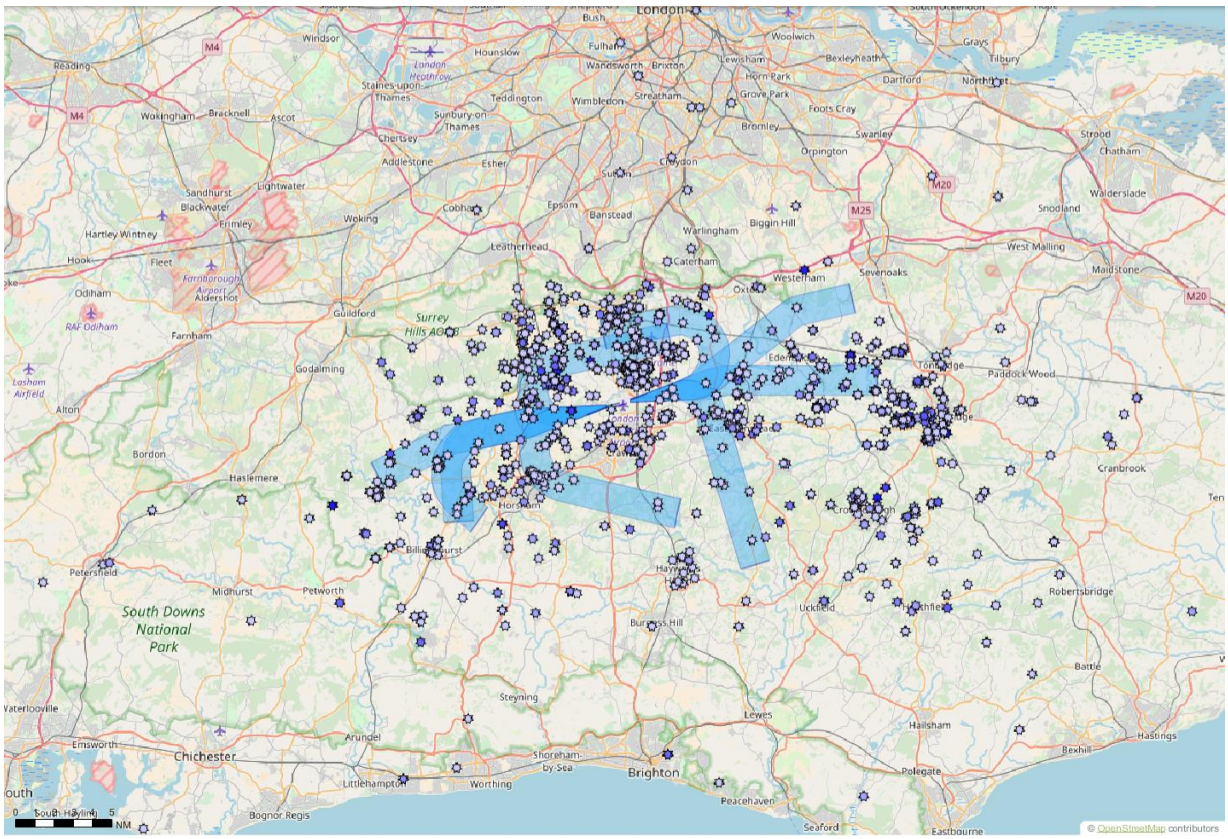


FIGURE 44 – THE LOCATION OF COMPLAINTS RECORDED FROM COMMUNITIES TO THE WEST

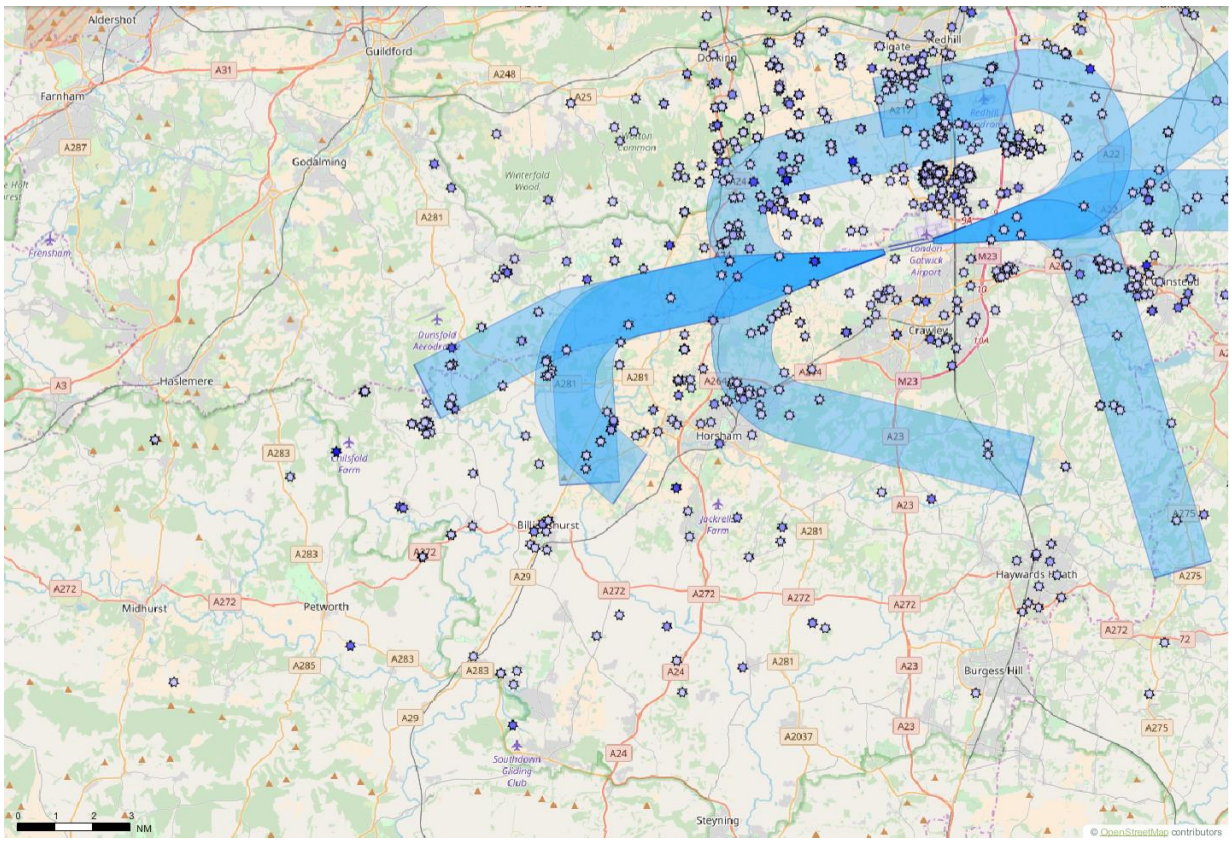



FIGURE 45 - THE LOCATION OF COMPLAINTS RECORDED FROM COMMUNITIES TO THE EAST

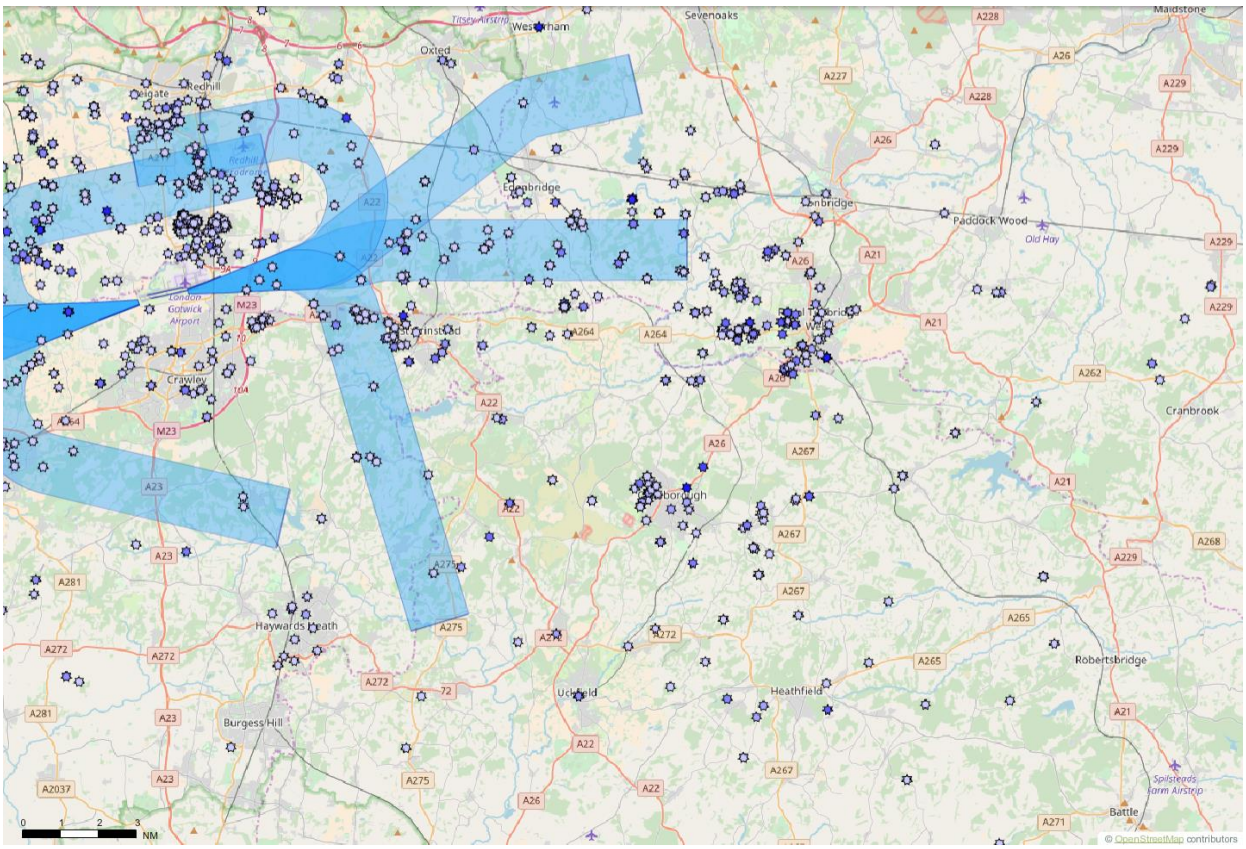
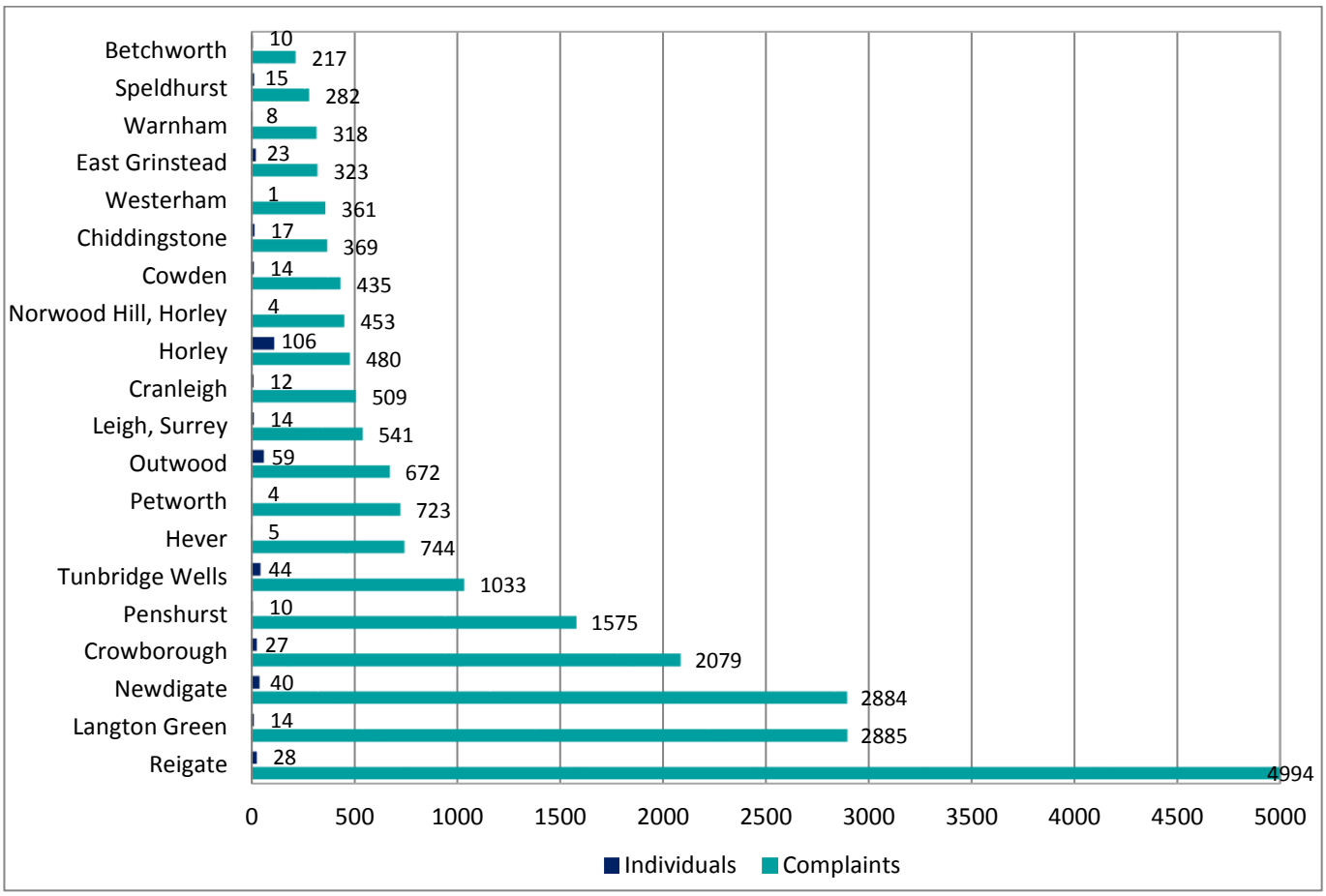


FIGURE 46 - THE TOP 20 LOCATIONS FOR COMPLAINTS IN 2017




## 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 a 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 analyse the types of aircraft that have caused concern. These statistics are provided overleaf in **Figure 47** and **Figure 48.**

FIGURE 47 - THE ANALYSIS OF THE DISTRIBUTION OF COMPLAINTS AGAINST AIRCRAFT TYPES COMPARED TO TOTAL MOVEMENTS 2017

| Type | Number of Complaints | Total Movements | % Complaints | % Movements |
|---|---|---|---|---|
| Airbus A320 | 2876 | 94363 | 24.70% | 33.00% |
| Airbus A319 | 2686 | 87821 | 23.07% | 30.71% |
| Boeing 737 | 1995 | 47074 | 17.13% | 16.46% |
| Airbus A380 | 801 | 2094 | 6.88% | 0.73% |
| Boeing 747 | 632 | 3159 | 5.43% | 1.10% |
| Airbus A321 | 570 | 13650 | 4.89% | 4.77% |
| Boeing 777 | 563 | 8232 | 4.83% | 2.88% |
| Airbus A330 | 414 | 3907 | 3.56% | 1.37% |
| Boeing 757 | 190 | 6433 | 1.63% | 2.25% |
| Other Light Aircraft | 175 | 241 | 1.50% | 0.08% |
| Boeing 787 | 155 | 6738 | 1.33% | 2.36% |
| Boeing 767 | 152 | 2170 | 1.31% | 0.76% |
| Embraer | 139 | 6308 | 1.19% | 2.21% |
| Helicopter | 130 | 38 | 1.12% | 0.01% |
| Airbus A310 | 44 | 440 | 0.38% | 0.15% |
| Cessna Citation | 42 | 168 | 0.36% | 0.06% |
| ATR 72 | 20 | 1362 | 0.17% | 0.48% |
| Airbus A340 | 11 | 16 | 0.09% | 0.01% |
| McDonnell Douglas | 10 | 82 | 0.09% | 0.03% |
| Airbus A350 | 9 | 618 | 0.08% | 0.22% |
| Lockheed | 9 | 6 | 0.08% | 0.01% |
| Beechcraft Jet | 8 | 16 | 0.07% | 0.01% |
| Gulfstream | 5 | 108 | 0.04% | 0.04% |
| Dash 8 Prop | 3 | 8 | 0.03% | 0.01% |
| Airbus A318 | 2 | 15 | 0.02% | 0.01% |
| Dassault Falcon | 2 | 70 | 0.02% | 0.02% |
| Canadair Regional Jet | 1 | 28 | 0.01% | 0.01% |
| Bombardier | 1 | 766 | 0.01% | 0.27% |
| Fokker 100 | 0 | 26 | 0.00% | 0.01% |

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. The most common aircraft types operating at Gatwick receive the most complaints.

**Figure 48** overleaf shows aircraft types classified by their comparable size and the percentage of complaints received per movement.

FIGURE 48 - THE ANALYSIS OF COMPLAINTS AGAINST AIRCRAFT TYPE BY COMPARATIVE SIZE 2017

| Class | Type | Number of Complaints | Total Movements | % Complaints | % Movements |
|---|---|---|---|---|---|
| **Large** | Boeing 777 | 563 | 8232 | 4.92% | 2.88% |
| **Large** | Boeing 787 | 155 | 6738 | 1.36% | 2.36% |
| **Large** | Airbus A330 | 414 | 3907 | 3.62% | 1.37% |
| **Large** | Boeing 747 | 631 | 3159 | 5.53% | 1.11% |
| **Large** | Boeing 767 | 152 | 2170 | 1.33% | 0.76% |
| **Large** | Airbus A380 | 801 | 2094 | 7.00% | 0.73% |
| **Large** | Airbus A350 | 9 | 618 | 0.08% | 0.22% |
| **Medium** | Airbus A320 | 2876 | 94363 | 25.15% | 33.07% |
| **Medium** | Airbus A319 | 2686 | 87821 | 23.49% | 30.78% |
| **Medium** | Boeing 737 | 1995 | 47074 | 17.44% | 16.50% |
| **Medium** | Airbus A321 | 570 | 13650 | 4.98% | 4.78% |
| **Medium** | Boeing 757 | 190 | 6433 | 1.66% | 2.25% |
| **Medium** | Bombardier | 1 | 766 | 0.01% | 0.27% |
| **Medium** | Embraer | 139 | 6308 | 1.22% | 2.21% |
| **Small** | ATR 72 | 20 | 1362 | 0.17% | 0.48% |
| **Small** | Other Light Aircraft | 175 | 241 | 1.53% | 0.08% |
| **Small** | Cessna Citation | 42 | 168 | 0.37% | 0.06% |
| **Small** | Gulfstream | 5 | 108 | 0.04% | 0.04% |
| **Small** | McDonnell Douglas | 10 | 82 | 0.09% | 0.03% |
| **Small** | Dassault Falcon | 2 | 70 | 0.02% | 0.02% |

**Figure 48** 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.

We should point out that helicopters are also a source of complaint, however very few operate from Gatwick, and 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.

To this end, we will continue to work with our airlines, Air Traffic Control and local community representatives to continue to improve the noise environment in and 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/aircraftnoiseandairspace**. Also available on this site is our Noise Lab which includes a free to use flight tracking tool which allows the public to track movements of Gatwick aircraft and also an interactive tool to view complaint data recorded in Casper.

# 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 sea level (asl).

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

**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 - See Casper below

**Casper:** The NTK system used by Gatwick Airport for accurate monitoring and management of airport operations and the associated noise.

## REFERENCES

CAA (2017) Survey of noise attitudes 2014: Aircraft **https://publicapps.caa.co.uk/docs/33/CAP%201506%20FEB17.pdf**

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

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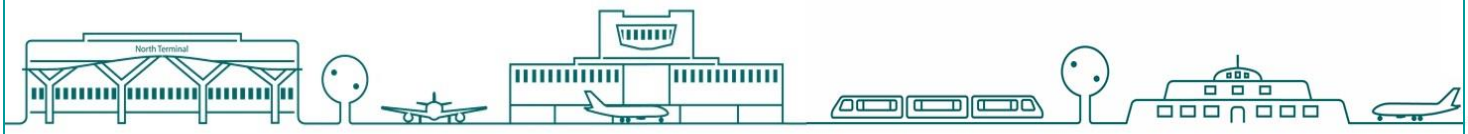


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