We are the Journey Makers

London Stansted Airport 2023 Quarter 1 Flight Evaluation Unit Report

This report includes data from the 1st January 2023 to 31st March 2023

MAG London Stansted Airport

Executive summary

There were 40,683 arrivals and departures recorded in this quarter. This number has decreased by 3,559 from the previous quarter. This will be partly due to our runway resurfacing project, and the associated night closures, as well as the seasonal reduction of flights during the winter period.

During this period, Continuous Descent Approach performance for Runway 22 ranged from 95% to 97% (24hr measure) and Runway 04 core night (23:30 – 06:00) ranged from 57% to 69%.

Departure track-keeping performance remained at very high compliance rates , ranging from 99.70% to 99.93%.

Continuous Climb performance ranged from 84% to 88%.

4 x Noise Infringements were recorded , 2 x daytime between 07:00 and 23:00, and 2 x night-time between 23:00 and 07:00.

During this quarter, the Flight Evaluation Unit (FEU) responded to all complaints within our response target of 8 days.

For more information, invite to visit the website: stanstedairport.com/community/noise/.

About this report

This report is intended to provide people who are interested in the noise impacts of Stansted Airport with information about aircraft operations and compliance with the airport's noise controls.

It is produced by the Stansted Airport Flight Evaluation Unit (FEU). The FEU is a team of specialists that manage aircraft noise and operational performance across all three airports within the Manchester Airports Group (Manchester, East Midlands and Stansted Airport).

Within the team we monitor, analyse and report: the noise recorded at our local community noise monitoring stations, the track keeping performance of our operating airlines and if procedures have been flown using Continuous Descent Approaches (CDAs) or Continuous Climb Operations (CCOs).

The team also investigate and responds to all community complaints regarding noise associated with the airport.

This monitoring and reporting allows us to identify any emerging issues that we can, where possible, address the issue raised.

Contents

Operational statistics – runway movements

Stansted Airport has a single runway, in a northeast to southwest orientation.

The direction of departures from Stansted Airport is dependent on the wind direction, as aircraft must take off and land into the wind. Most of the time at Stansted Airport, the wind comes from the south-west, meaning aircraft will depart to the south-west (Runway 22). When the wind is from the north-east, aircraft will depart to the north-east (Runway 04). The percentage of operations in each runway direction is known as the modal split.

Figure 1 – Aircraft Movements by Runway

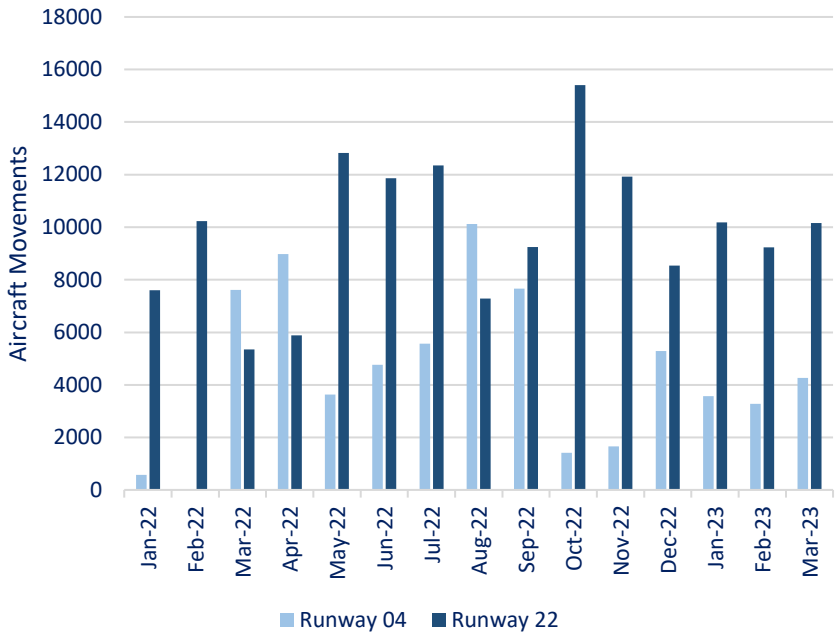
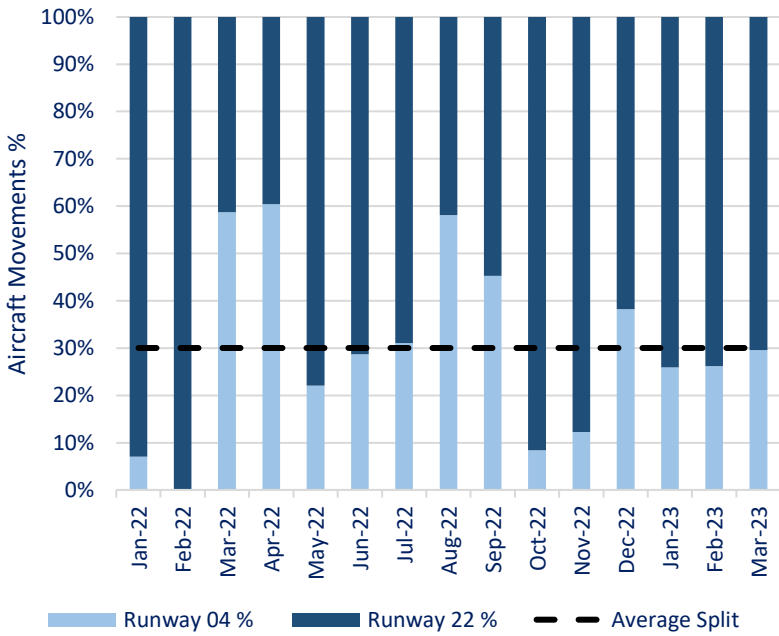


Figure 2 – Runway Modal Split in %



Arrivals – continuous descent approach

A Continuous Descent Approach (CDA) is a technique whereby an aircraft descends on a smooth continuous glide path (like standing on an escalator rather than walking down the stairs), therefore staying higher above the ground for longer. This reduces the level of arrival noise heard on the ground and emissions, as well as the amount of power going into the engines, as it remains constant.

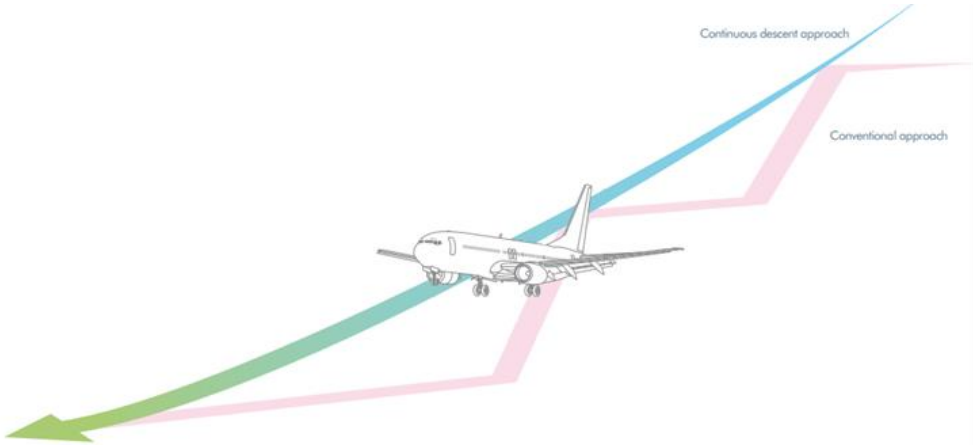
A CDA relies on the accuracy of track miles provided by Air Traffic Control (ATC) to the flight crew, pilot skill, weather and operational circumstances. Additionally, different aircraft types perform differently requiring varying operating practices to be able to slow the aircraft down and meet speed restrictions. The requirement for a pilot to fly a CDA is therefore not compulsory, rather it is to fly a CDA whenever practical.

In addition to aiding noise reduction, CDAs reduce fuel burn thereby cutting emissions and producing an overall environmental benefit. Due to airspace restrictions in the London area, it is not always possible to achieve a CDA when arriving on Runway 04 (landing from the south-west). Over 94% of all aircraft arriving at Stansted Airport on Runway 22 (landing from the north-east) use a CDA.

We have a commitment with NATS, our Air Traffic Services provider, to improve CDA compliance to Runway 04 at night where operational circumstances allow.

We measure CDA compliance from 6,000ft to the runway.

Figure 3 – Continuous Descent Approach (CDA) Profile



Arrivals – continuous descent approach

Figure 4 – Runway 22 Continuous Descent Approach Compliance (24hrs)

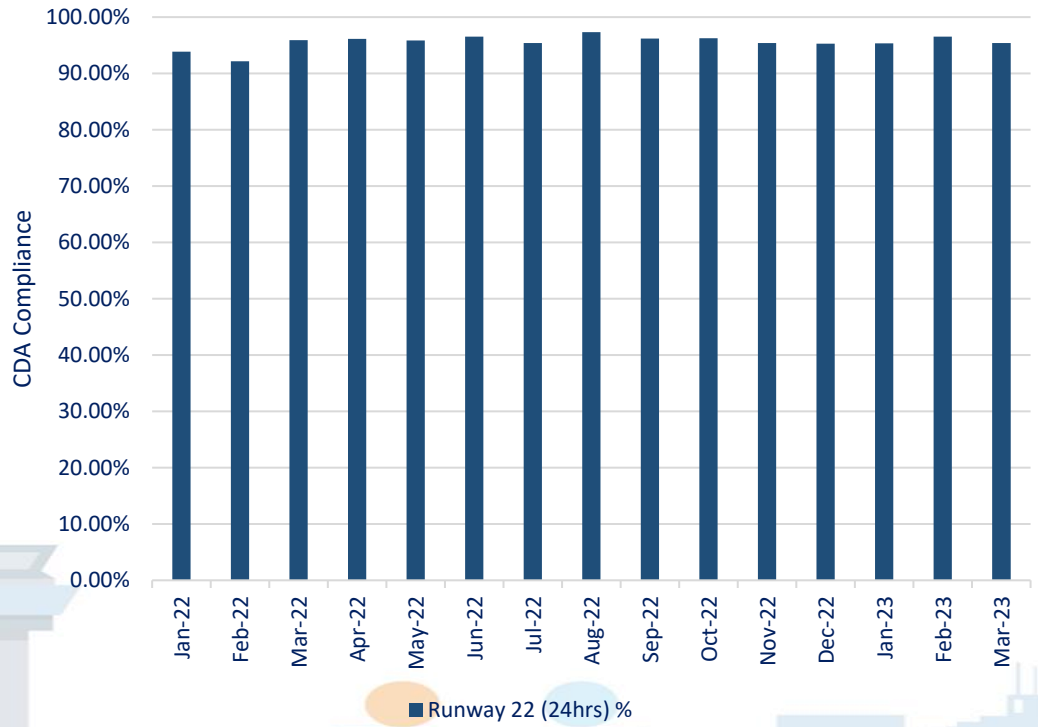
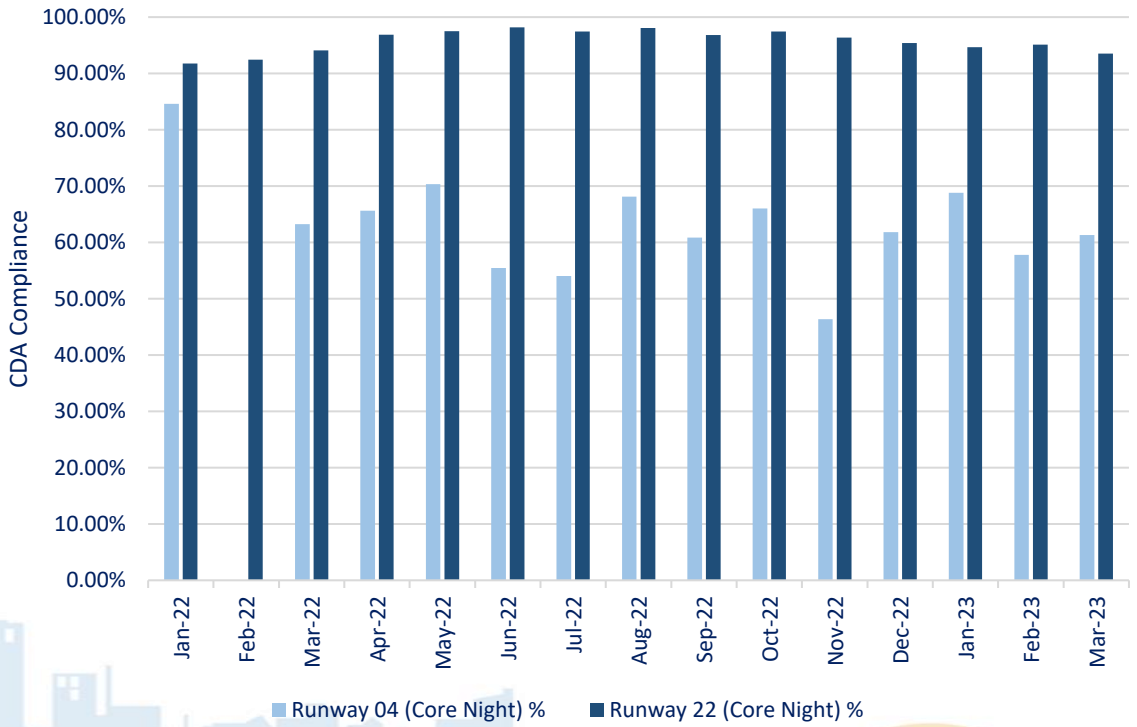


Figure 5 – Runway 04 and 22 Continuous Descent Approach Compliance (Core Night)

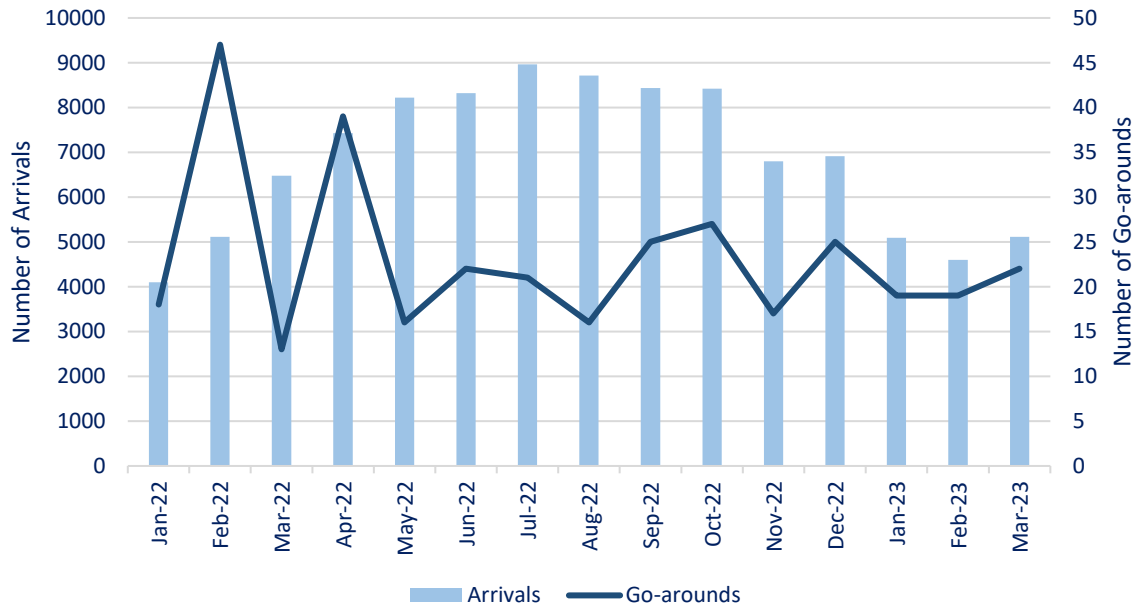


Arrivals – go-arounds

A go-around is a safe, standard aircraft manoeuvre, where an aircraft discontinues their approach before landing. Go-arounds ensure passengers and aircraft are kept safe. The go-around procedure is adopted when an arriving aircraft on final approach aborts landing, by applying increased power and climbing away from the airport. It is a set procedure to be followed by the flight crew in the event of an aircraft being unable to land.

The procedure is published so that Air Traffic Control (ATC) and pilots know where the aircraft will expect to fly following the decision to go around, usually, by following the ground track of a departure. This is known as a standard missed approach. In the event of a go-around, if another aircraft is involved, for example, a departure that has just taken off, the Air Traffic Controller must ensure that the two aircraft are safely separated. This separation is achieved by turning one of the aircraft earlier and may result in a non-standard missed approach.

Figure 6 – Arrivals and Go-arounds



Arrivals – instrument landing system joining point

The Instrument Landing System (ILS) is a beam which is aligned with the runway centreline in order to guide aircraft in a straight line approach to the runway for landing. It consists of two signals, one giving vertical guidance (the glideslope) and the other giving horizontal guidance (the localiser).

Arriving aircraft don't follow fixed approach paths, this is to enable separation and maintain safety. As a result, Air Traffic Control (ATC) have flexibility about where they direct aircraft to join the ILS.

The point at which an aircraft connects to the ILS is known as the joining point. To reduce noise disturbance from aircraft using the ILS to approach the airport, we require pilots to remain at an altitude of at least 2,000ft when they join the ILS glidepath. During the core night period (23:30 to 06:00), we require NATS to direct aircraft to join the ILS glidepath at a minimum altitude of 3,000ft and at a distance of at least 10 nautical miles from landing.

Figure 7 – Night Time ILS Joining Point Compliance

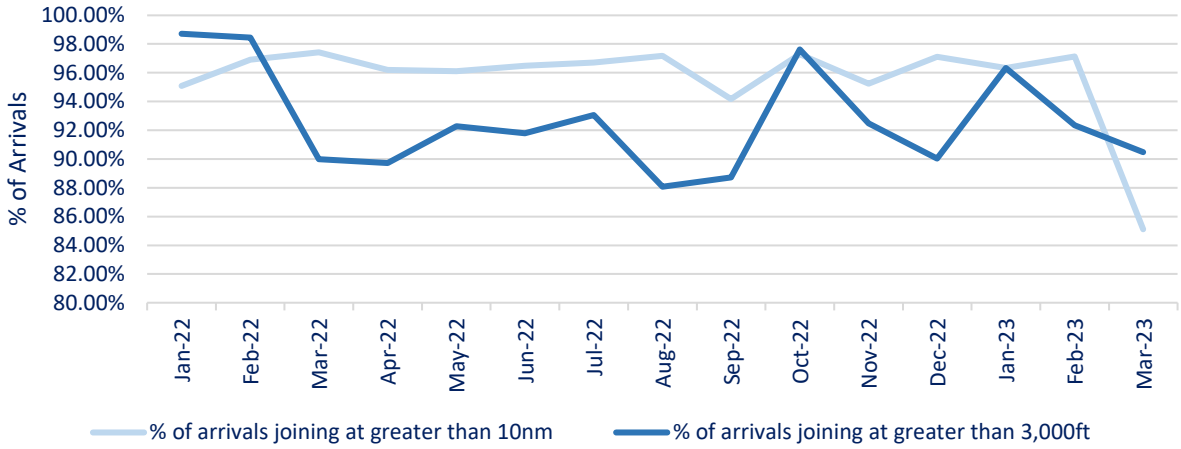
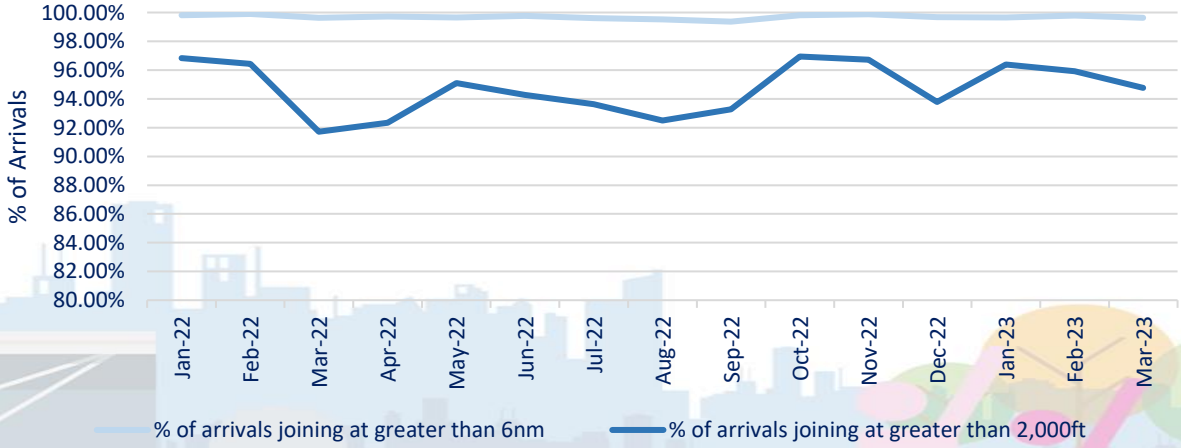


Figure 8 – Day Time ILS Joining Point Compliance



Arrival and departure overflights

Aircraft are required to avoid areas listed in the Aeronautical Information Publication (AIP).

The AIP states;

“Aircraft shall maintain as high an altitude as practicable, shall avoid flying over Bishop’s Stortford and shall avoid flying over Sawbridgeworth and Stansted Mountfitchet at an altitude of less that 2,500ft and shall avoid flying over St Elizabeth’s Home (*514949N 0000523E) at an altitude of less than 4,000ft (Stansted QNH).”

Figure 9 – Bishop’s Stortford Overflights

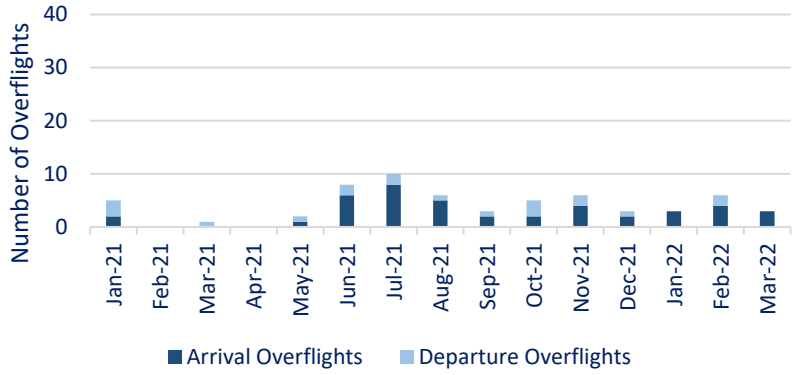


Figure 10 – St Elizabeth’s Home Overflights

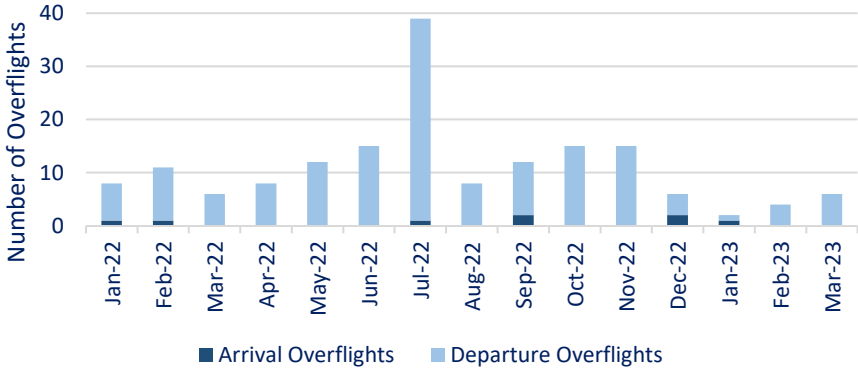


Figure 11 – Sawbridgeworth Overflights

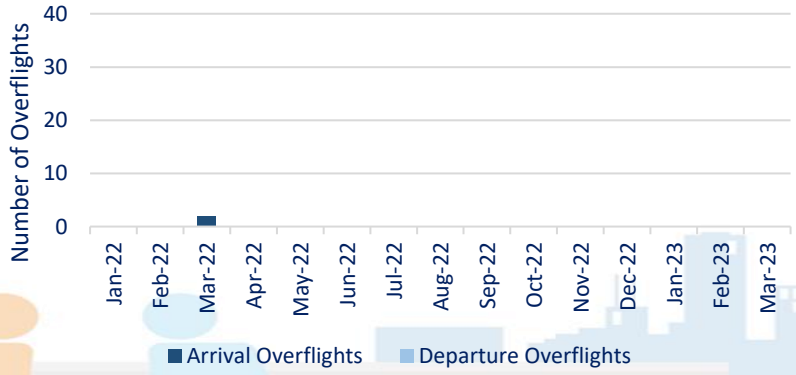
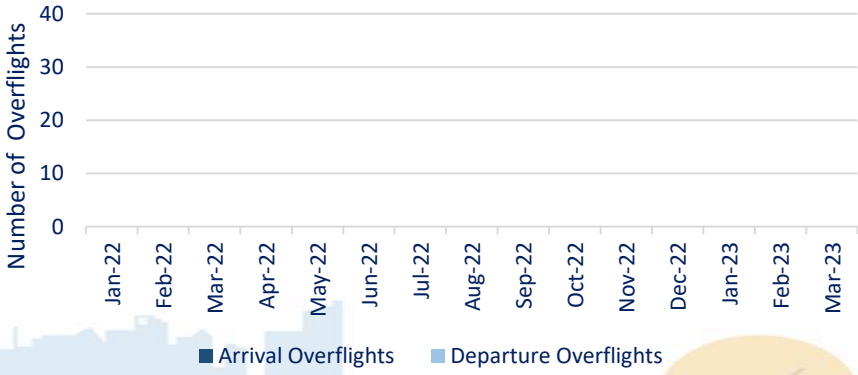


Figure 12 – Stansted Mountfitchet Overflights



Departures – noise preferential routes

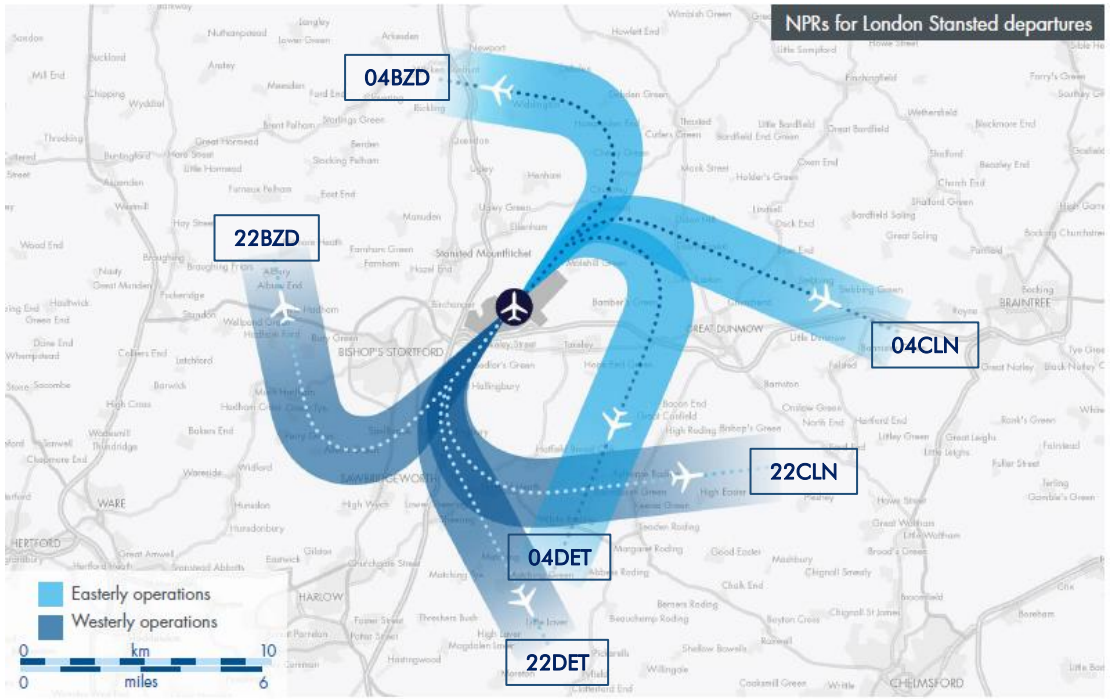
All jet aircraft and most propeller-driven aircraft departing from Stansted Airport follow initial flight paths, known as Noise Preferential Routes (NPRs). At Stansted Airport, there are six NPRs – three at each end of the runway.

The NPRs at Stansted Airport were set by the Department for Transport in 1989. The routes were designed so that aircraft avoided flying over the larger populated areas until they had reached a minimum height. As an airport operator, Stansted Airport has no authority to change these routes.

As aircraft cannot fly in the same way that a train runs on tracks, this means that there will be some variation as to where different aircraft will be within the NPR. This is because all aircraft perform differently and may be affected by weather conditions which can cause them to drift to the left or right. It is for these reasons that each NPR has a 'swathe' measuring 1.5 kilometres either side of the routes centreline, resulting in a virtual corridor three kilometres wide. As long as the aircraft fly within this 3km corridor, they are considered to be on-track.

Each NPR has a minimum height at which aircraft can be vectored onto a more direct heading to its destination by Air Traffic Control. These minimum heights are shown on the next page (Figure 14).

Figure 13 – Noise Preferential Routes (NPRs) for departures

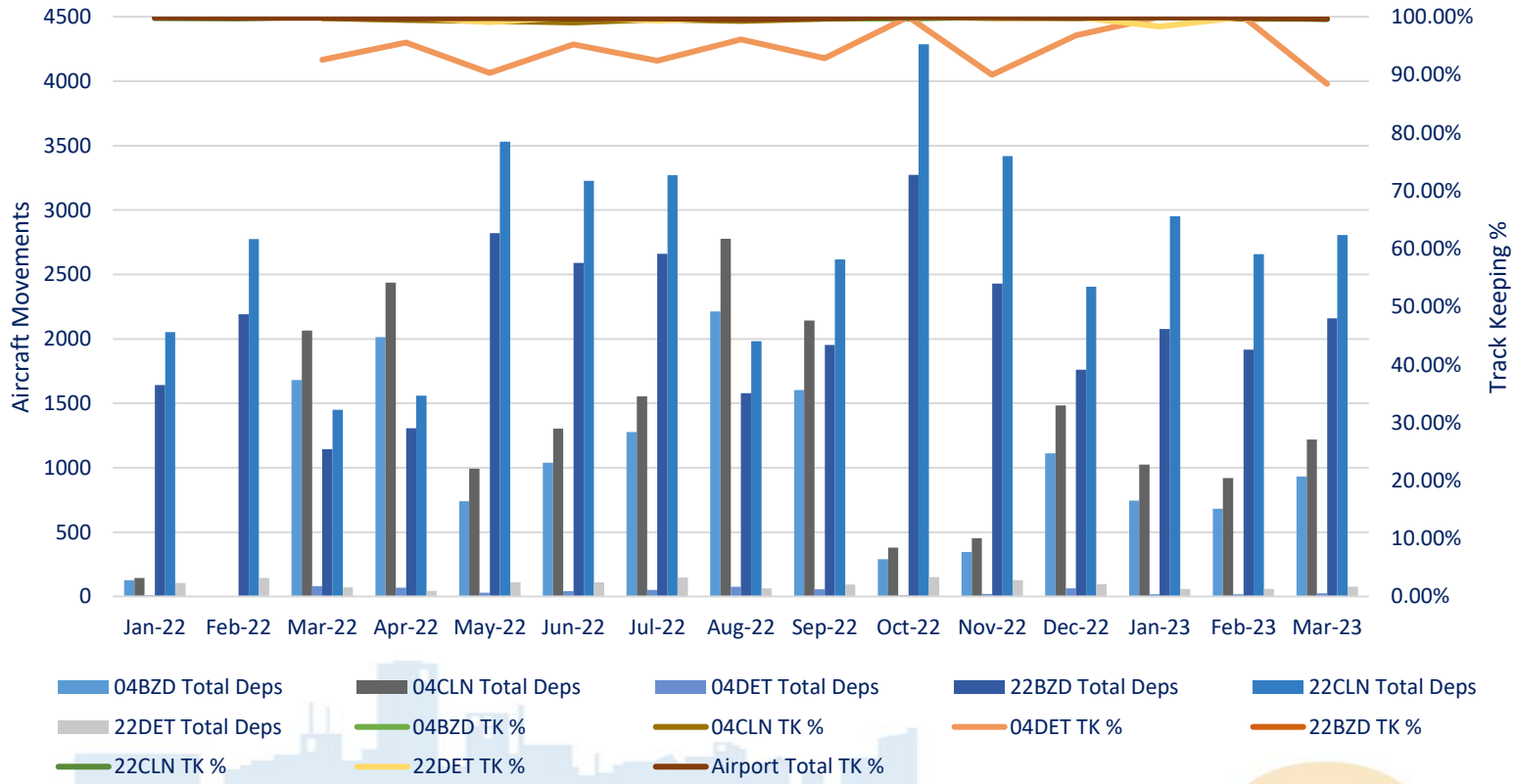


Departures – track keeping

Figure 14 – NPR Minimum Vectoring Heights

Route	Minimum Vectoring Altitude (day 06:00- 23:30)	Minimum Vectoring Altitude (night 23:30- 06:00)
22CLN	4,000ft	4,000ft
22DET	4,000ft	4,000ft
22BZD	3,000ft	4,000ft
04CLN	4,000ft	4,000ft
04DET	4,000ft	4,000ft
04BZD	3,000ft	4,000ft

Figure 15 – Track Keeping (TK) and Route Usage



Departures – track keeping

Figure 16 – Track Keeping Compliance (24hrs)

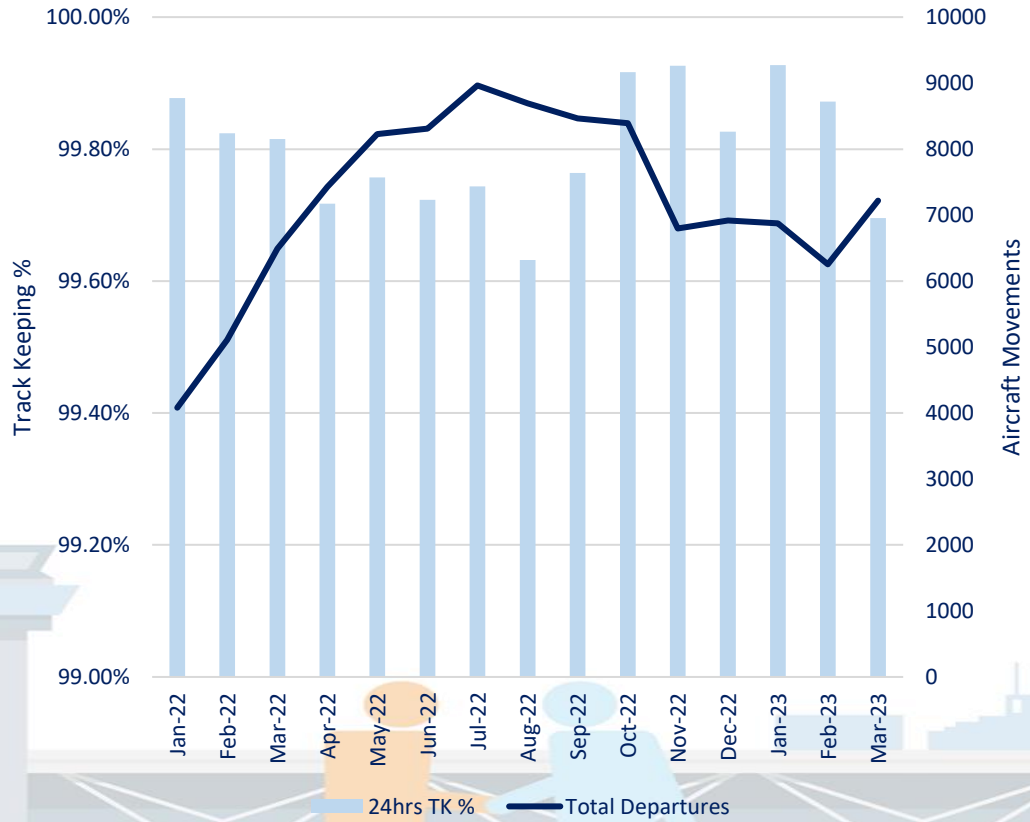
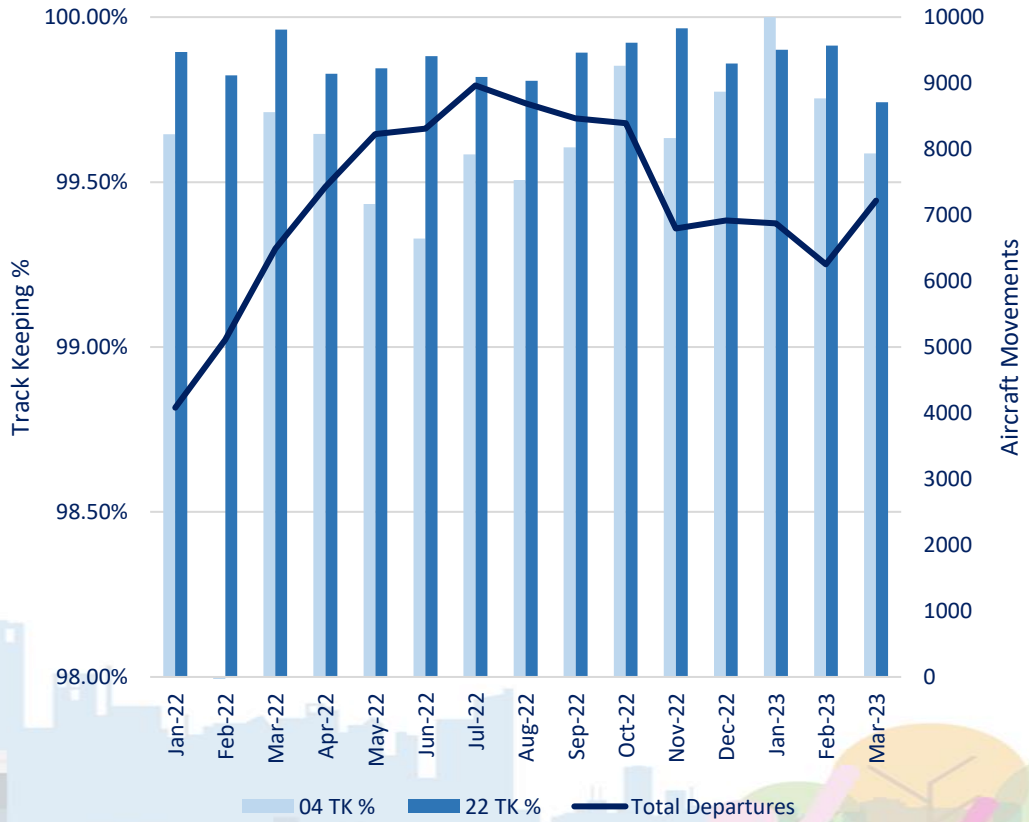


Figure 17 – Track Keeping Runway 04/Runway 22 Compliance



Departures – track keeping

Figure 18 – Track Keeping Runway 22 NPRs

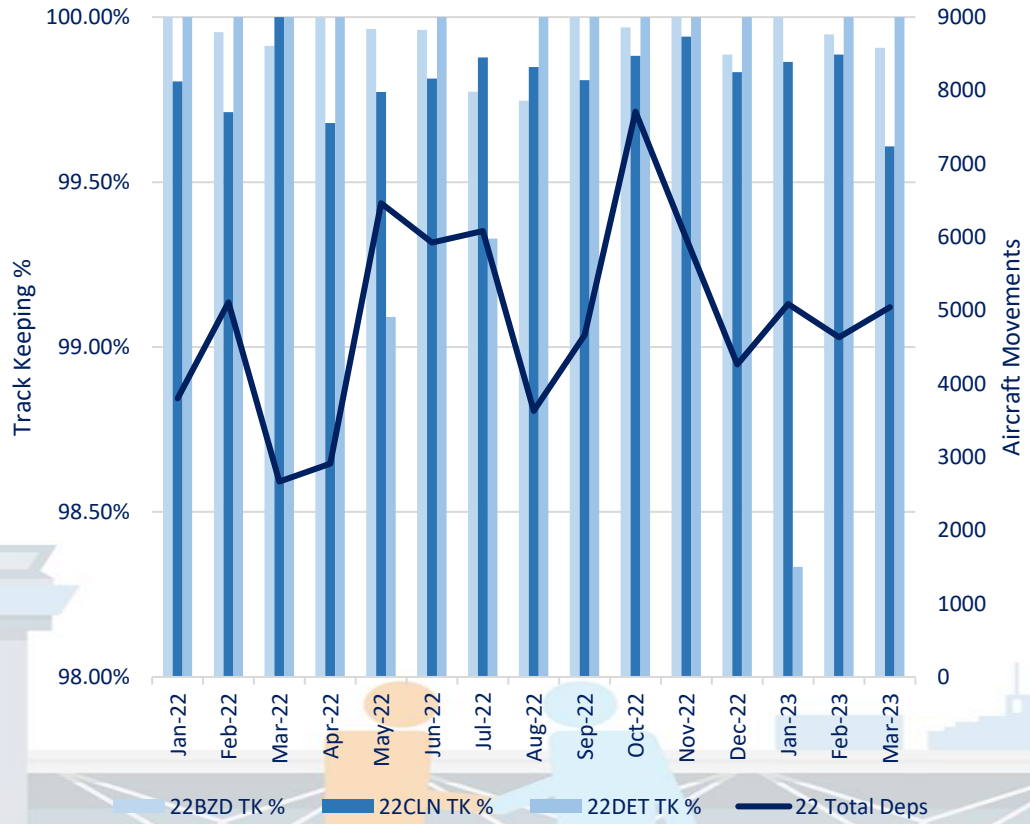
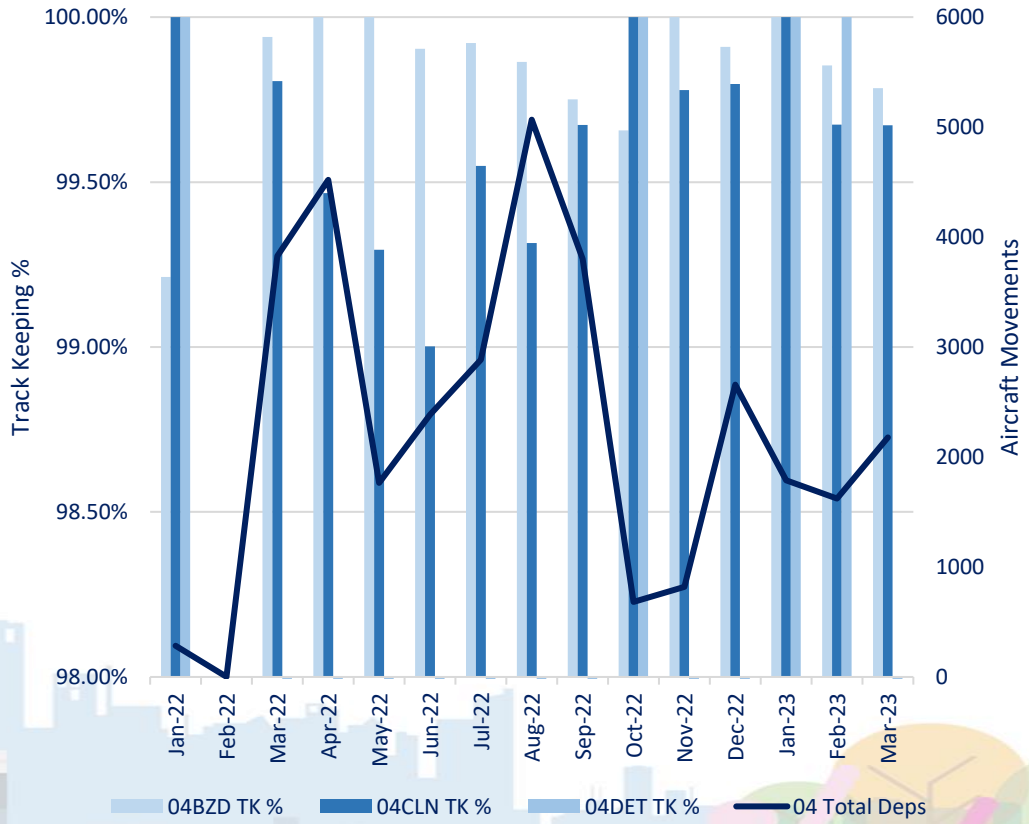


Figure 19 – Track Keeping Runway 04 NPRs



Departures – continuous climb operations

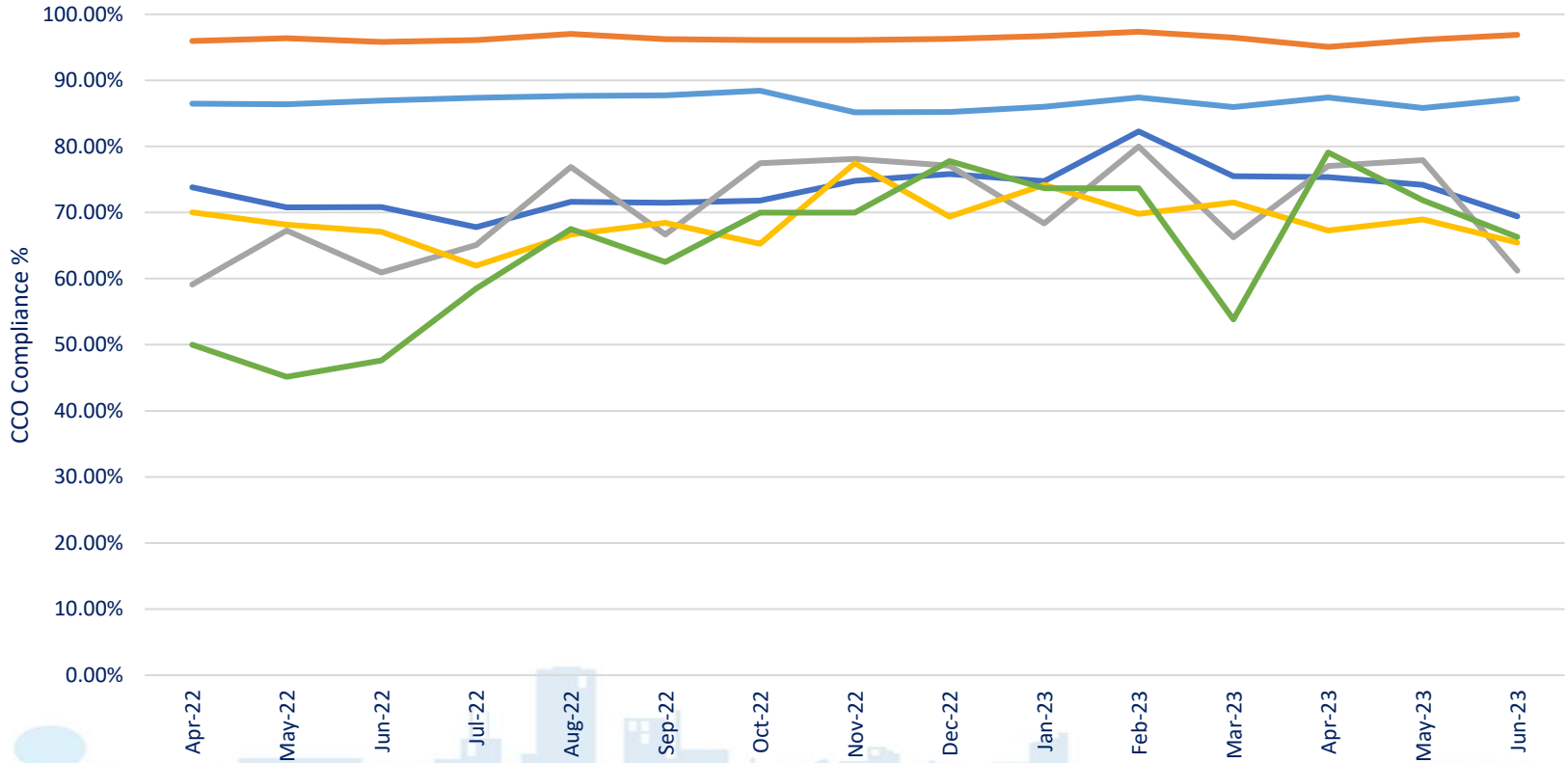
When departing, an aircraft is initially given a ‘stop climb’ altitude of 4,000ft. This is the altitude the aircraft cannot climb beyond without further instruction from Air Traffic Control (ATC).

If an aircraft does not receive further climb instructions, the aircraft will fly level for a period of time until further climb is approved.

Level flight on departure usually occurs when there are routes from other airports that interact and an aircraft has to be held level until it is safe to climb further.

We monitor Continuous Climb Operations (CCO) from start of roll to 10,000ft above mean sea level (amsl) on each of the departure routes.

Figure 20 – CCO Compliance



Departures – performance based navigation

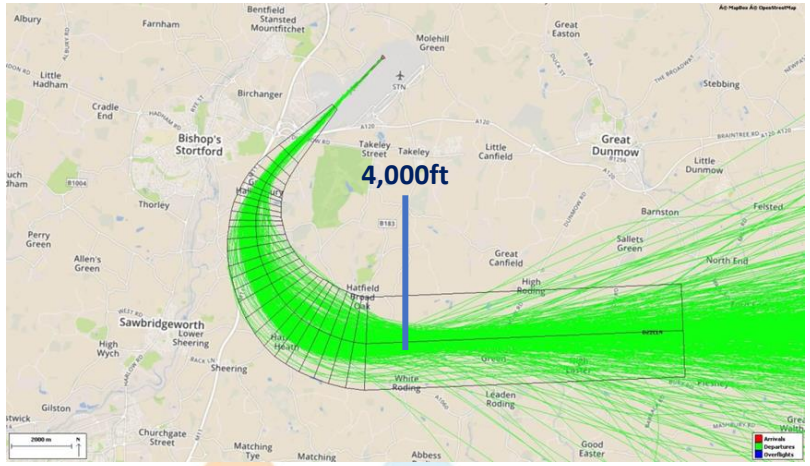
Following feedback from local communities, we worked with the Stansted Airport Consultative Committee (STACC) sub committee – Environmental Issues Group (EIG), Noise and Track Keeping Working Group (NTKWG), NATS, Civil Aviation Authority (CAA) and our operators to identify opportunities to reduce the area overflown by aircraft departing on the Runway 22 CLN departure route. As a result, we trialled Required Navigational Performance of 1NM with Radius to Fix turns (RNP1(RF)) procedures for a number of years.

The trial was conducted “to improve the adherence to the current ‘flight path’ Standard Instrument Departure (SID) / Noise Preferential Route (NPR) centreline through replication”.

Every aircraft type has unique characteristics and will fly conventional procedures slightly differently, but utilising RNP1(RF) enabled greater precision and adherence to the designed route when flying RNP1(RF) procedures.

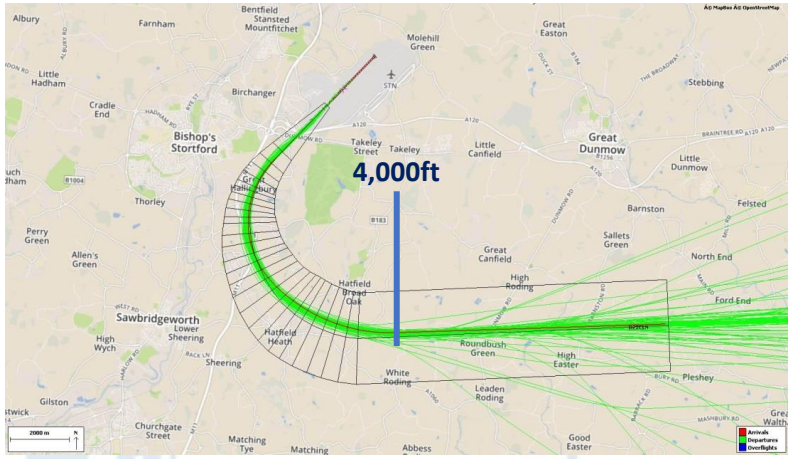
Subsequently, due to the much greater accuracy of these departure procedures, we now report track keeping compliance for PBN departures to +/-500m , instead of the traditional +/-1,500m swathe.

Figure 21 - Conventional Departure Procedures



- Wide spread of tracks across corridor +/- 1,500m
- ATC vectoring above 4,000ft

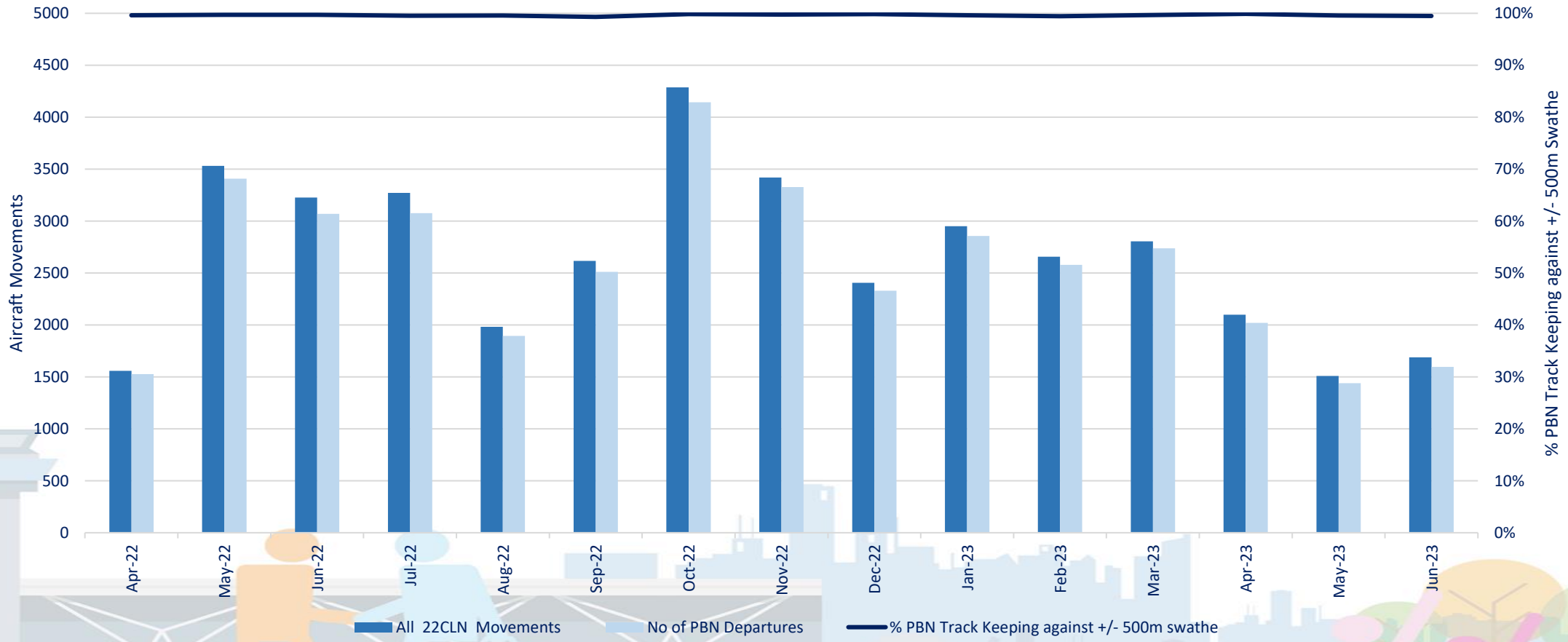
Figure 22 – RNP1 (RF) Departure Procedures (PBN)



- Narrow spread of tracks between Hatfield Heath and Hatfield Broad Oak – avoiding direct overflight
- ATC vectoring above 4,000ft

Departures – performance based navigation

Figure 23 – Performance Based Navigation (PBN) Departure Track Keeping Compliance



Departures – noise infringements

At Stansted Airport we have eight fixed noise monitors – four placed at each end of the runway. Departing aircraft fly over these monitors after take-off and the noise levels are recorded in the Airport Noise and Operations Monitoring System (ANOMS).

Previously the noise limits were 94 decibels (dB) for daytime, (07:00- 23:00), 89dB (23:00 – 23:30 and 06:00 – 07:00) and 87dB for the core night period (23:30- 06:00).

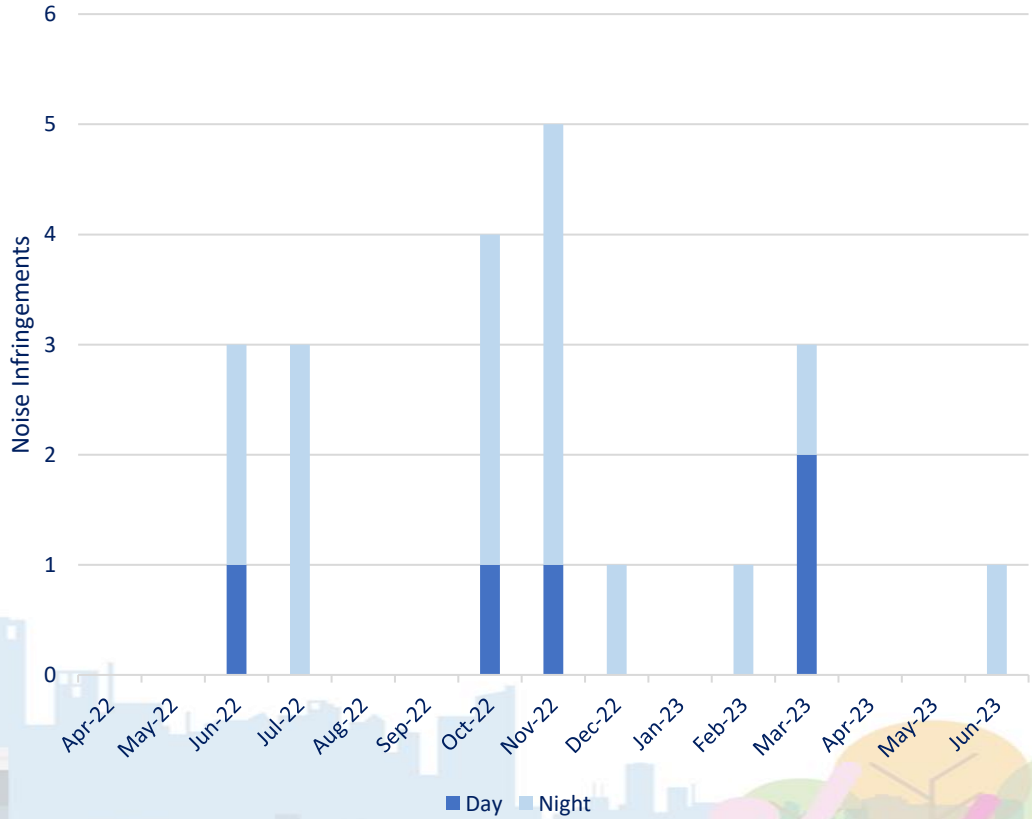
A part of our Noise Action Plan (NAP) commitments, in May 2022, these limits were reduced and simplified to an 89dB limit for the daytime period (07:00- 23:00) and 84dB for the night-time period (23:00- 0700).

If an aircraft exceeds these noise limits, the airline pays a fine, the monies are transferred to our Community Fund and invested in local projects.

The noise monitors and recorded departure noise levels are displayed on our WebTrak system: [WebTrak : Stansted (emsbk.com)]

WebTrak is our online information tool that shows all operations associated with Stansted Airport, as well as our noise monitoring terminals.

Figure 24 – Noise Infringements



Noise monitoring

At Stansted Airport, we have a sophisticated noise monitoring system that uses eight microphones. These microphones are located underneath the departure flight paths used by aircraft, at a distance of approximately 6.5 kilometres (km) from the point on the runway where an aircraft begins its take-off. We chose this point as it coincides with the internationally agreed monitoring point at which noise from an aircraft is measured as it is certified before entering service. By measuring at this point we can therefore ensure that noise from an aircraft when it is flying at Stansted Airport is no more than when it was certified before entering service.

On average, an aircraft at this point in its flight will record 75 decibels (dB), though some aircraft will be in excess of 90dB and some below 65dB. In general, larger and older aircraft are noisier whilst smaller and more modern aircraft are quieter. Many other factors will influence aircraft noise, particularly weather and wind direction.

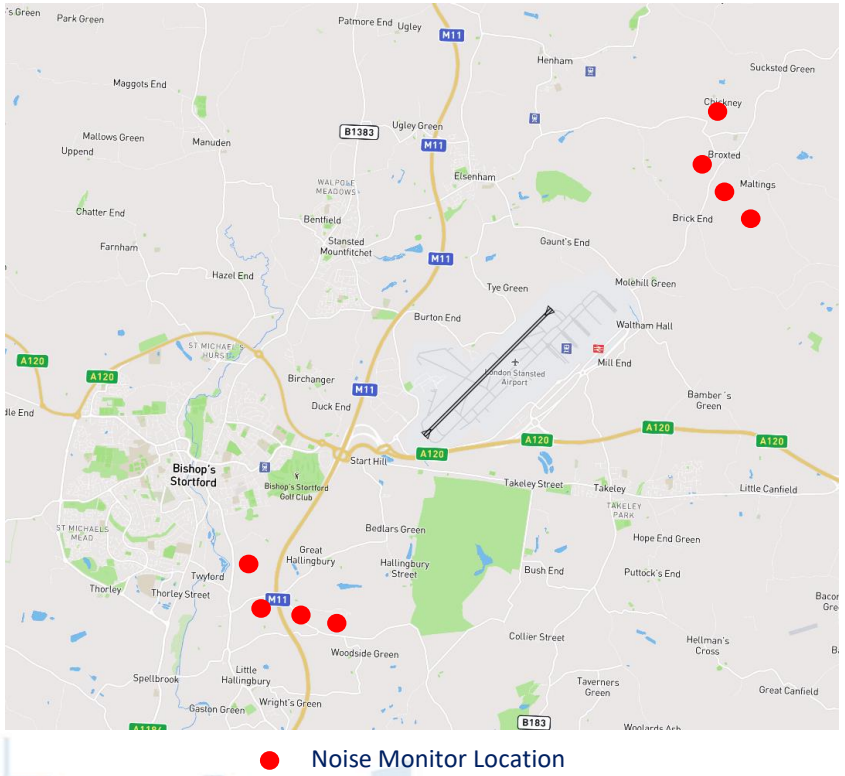
Runway 04 Noise Monitors

- Anglian Water
- Moor End Farm
- Goodacres
- Chickney Hall Villas

Runway 22 Noise Monitors

- Howe Green
- Thames Water
- Woolcotts
- Morleys

Figure 25 – Noise Monitor Locations



Night operations

Each aircraft type is classified and awarded a QC value depending on the amount of noise it generated under controlled certification conditions. The quieter the aircraft, the smaller the QC value. Aircraft are classified separately for landing and take-off.

Figure 26 – Quota Count (QC)

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

By virtue of 'designated' status, the Secretary of State for Transport sets seasonal limits on Night Movements and Noise Quota.

There are two time periods associated with the regime:

- **Night Period 23:00 – 07:00**
  QC8 or 16 rated aircraft are banned from operating
- **Core Night Period 23:30 – 06:00**
  QC4 rated aircraft are banned from operating

The movements limit is the number of Air Transport Movements (ATMs) that operate in the core night period.

Noise Quota is the sum of the arrival or departure points value in terms of Quota Count (QC) Points for each movement in the core night period.

Figure 27 – STN Movement and Quota Limits per season

Season	Movements	QC Points
Summer	8,100	4,650
Winter	5,600	3,310
Annual Total	13,700	7,960

Historically, for each 5 year regime, Movement and Quota Count limits have remained unchanged. The only significant change from Winter 2017 was the introduction of a QC 0.125 band and slight increase in Movements at Stansted to account for no "exempt" aircraft.*

* QC 0 rated aircraft would previously not have counted against the movement limit.

Night operations – dispensations

The night operations regime allows for flights to be ‘dispensed’ where the operation was delayed into the night period due to exceptional circumstances.

The reasons for dispensations can include delays and disruption (ATC industrial action, equipment failure, weather, ATC staffing), Government exemption as directed by the Secretary of State, and where there is a risk to life (medical emergencies).

The numbers of dispensations applied can vary greatly from week to week and all are reported to Government.

Figure 28 – Summer 2022 Dispensations

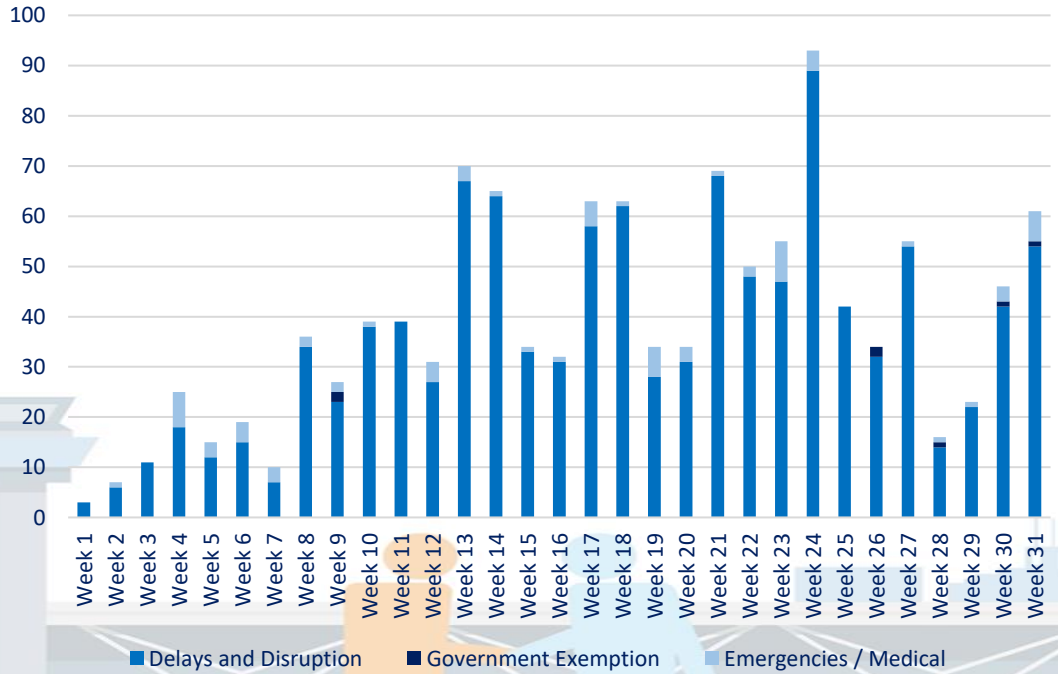
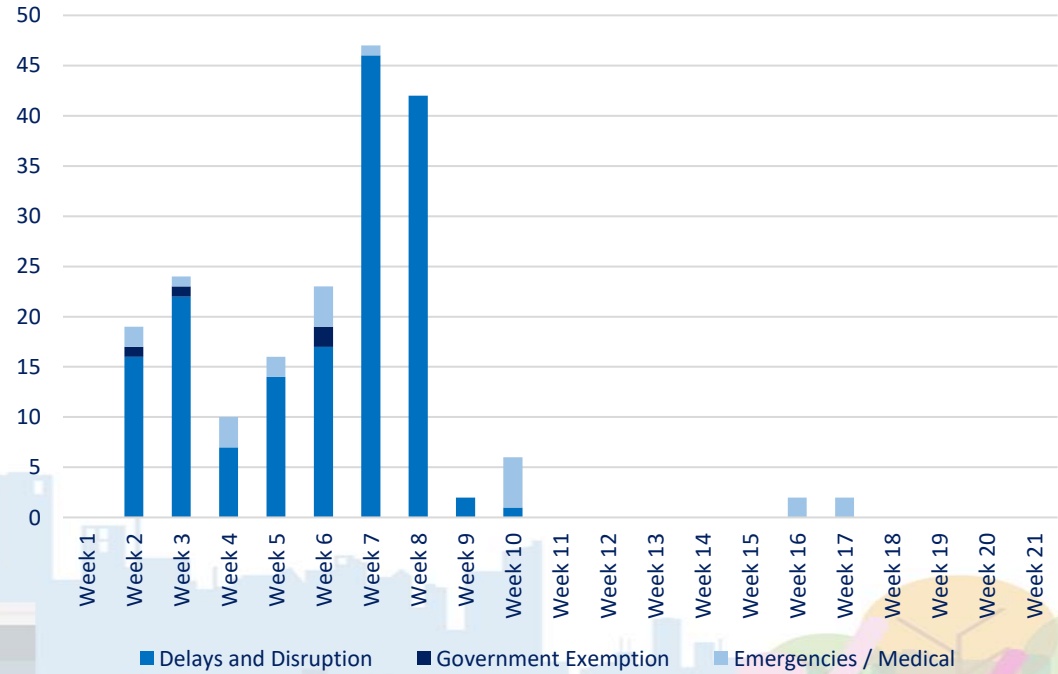


Figure 29 – Winter 2022 Dispensations



Night operations

Figure 30 – Core Night Movements (net of dispensations)

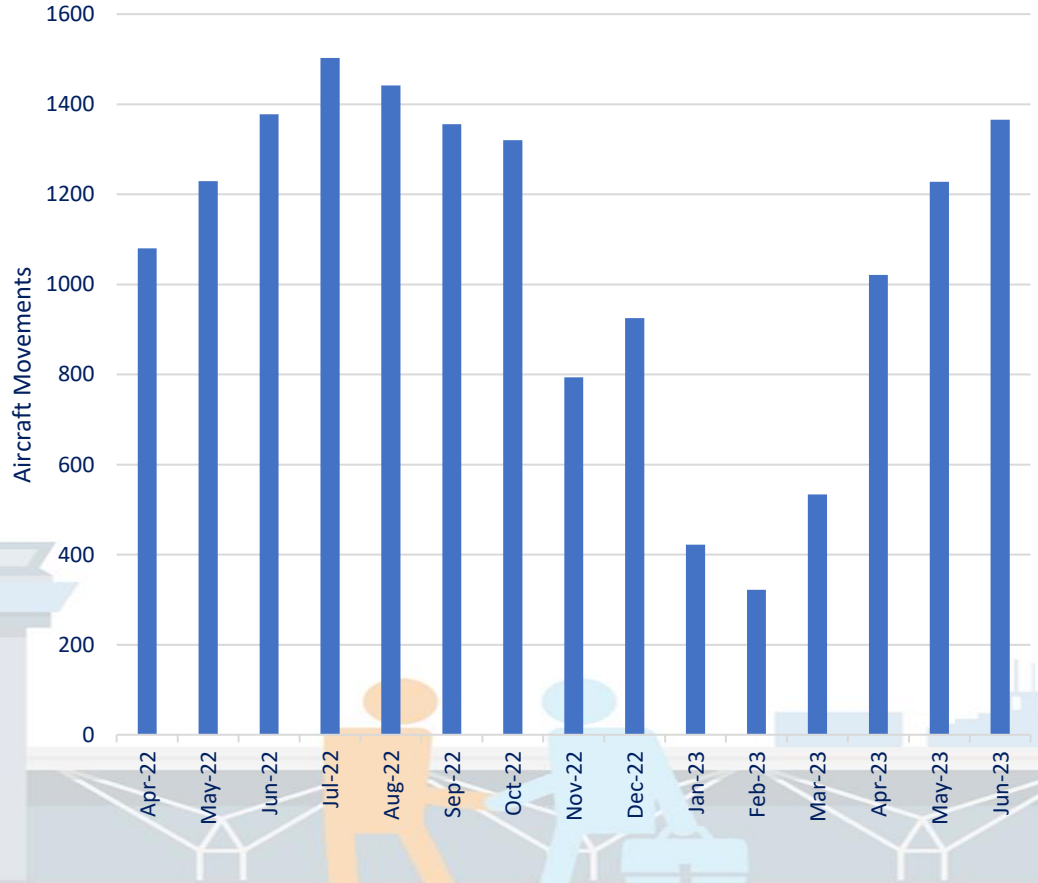
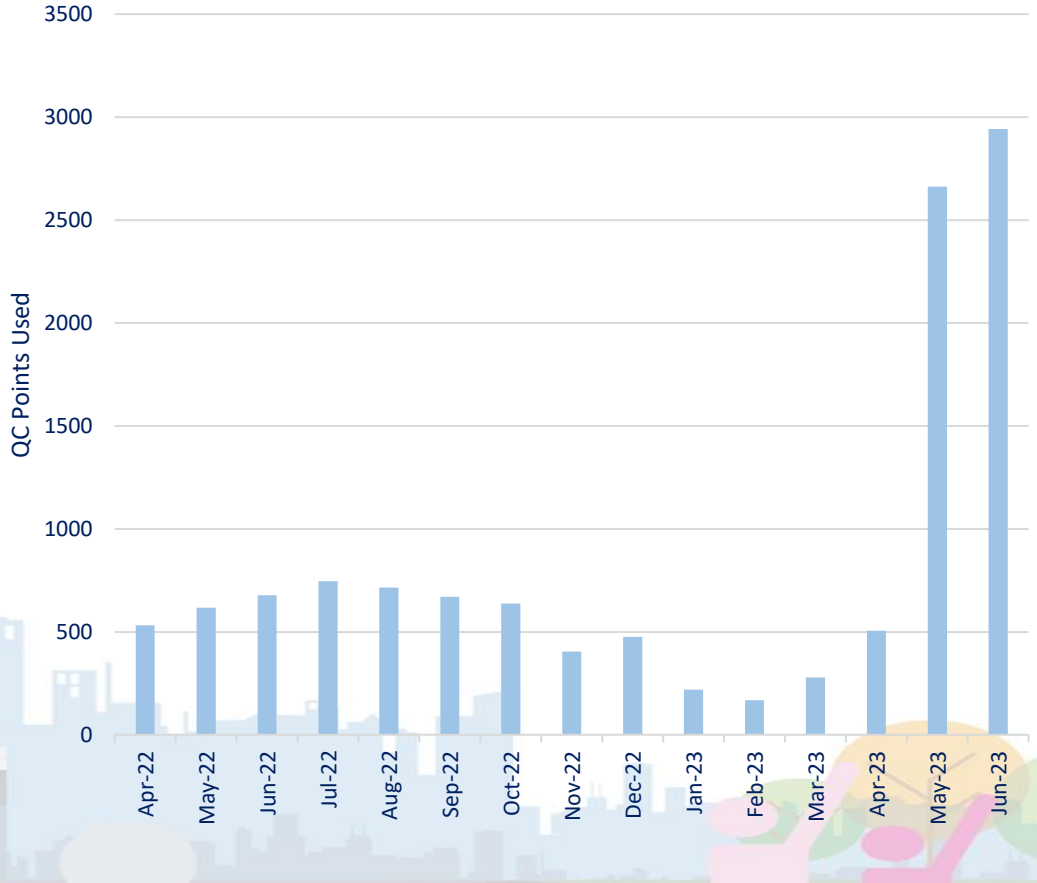


Figure 31 – Core Night QC Points (net of dispensations)



Complaints

We record all complaints we receive, investigating them and responding within a target response time of 8 days. As the summer weather gets warmer, individuals tend to open their windows and spend more time outside, and therefore exposed to more aircraft noise than what they would in the winter season. Between January – March 2023, there were 1,953 complaints made by one individual in Harlow, 980 complaints made by one individual in Bardfield Sailing, and 80 complaints made by one individual in Rayne. Additionally, there were 15 complaints made by 14 individuals in Bishop's Stortford. Historically, the most frequent method in which we are contacted, is via email. However, we have seen an increase in the number of complaints made via the Web Form. We also receive complaints to our answerphone and via post.

Figure 32 - Complaints

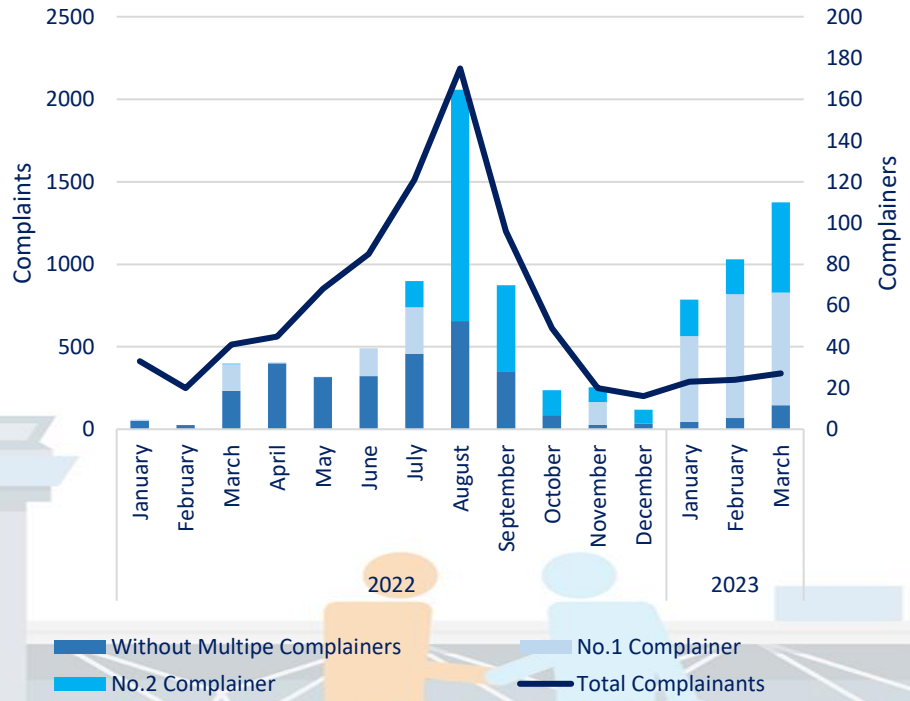


Figure 33 – Complaint Areas

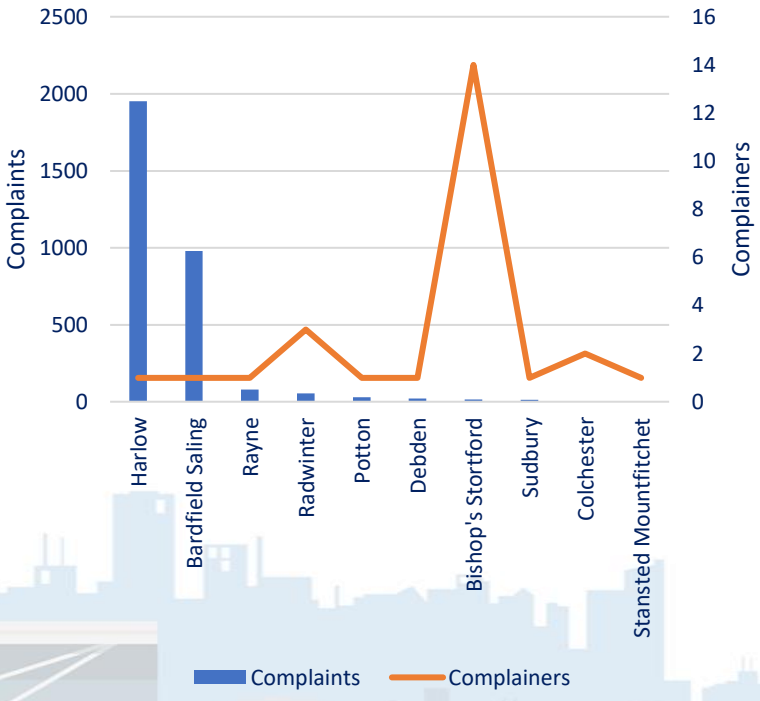


Figure 34 – Complaint Methods

Method	Complaints
Answerphone	75
Email	5,524
Letter	1
Web Form	536

ANNEX A – roles and responsibilities

Stansted Airport Limited (STAL)

STAL is the licensed operator of Stansted Airport.

The Flight Evaluation Unit (FEU)

The FEU is responsible for recording, investigating and responding to aircraft noise enquiries as well as to monitor and report airline compliance and noise mitigation measures as detailed in the UK AIP. The FEU can, if requested, provide information regarding flight paths and arrival routes, for example to prospective homebuyers. The FEU also manages the Airport Noise and Operation Monitoring System (ANOMS) and a number of fixed and mobile noise monitors within the local area.

Air Traffic Control (ATC)

NATS is the main Air Navigation Service Provider in the United Kingdom who provide guidance to flights in the vicinity of Stansted Airport, and also manage higher level airspace across the UK.

The Stansted Airport air traffic control is operated by NATS, who oversee the runway and ground operations.

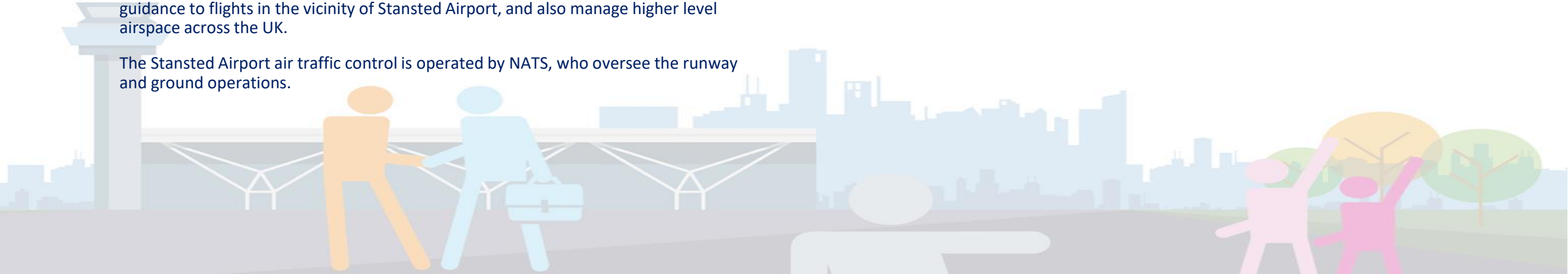
Department for Transport (DfT)

The DfT is responsible for the formulation of noise abatement policy, the location of the Noise Preferential Routes (NPRs) for departing aircraft and night flight regulations.

Civil Aviation Authority (CAA)

As the UK's independent specialist aviation regulator, the CAA has responsibility for regulating airspace over the UK. This includes the new and established air traffic routes and areas which commercial aircraft use to fly into and out of airports, and the airspace used by military and General Aviation flights.

An organisation proposing a change to the design of UK airspace must follow the CAA's airspace change process. The CAA has a duty to consider a range of factors set out by government in deciding whether or not to approve the change. One set of factors is the environmental objectives set for the CAA by the Secretary of State- including consideration of noise impacts.



ANNEX B – departure noise limits

To the right, the top diagram gives an indication as to what the old noise restrictions were, prior to them being changed in May 2022.

The bottom diagram shows what the **current** noise restrictions are.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