This report presents the year 2010 noise exposure contours for London Stansted Airport. The 57 dBA Leq contour area for 2010 based on the actual runway modal split was calculated to be 22.5 km², which was 7% smaller than in 2009. The population enclosed within the actual 57 dBA contour decreased by 7% compared to 2009.
The authors of this report are employed by the Civil Aviation Authority. The work reported herein was carried out on behalf of the Department for Transport.

Any views expressed are not necessarily those of the Secretary of State for Transport.

© Crown Copyright 2011. Such copyright is managed through the Department for Transport, under delegation from the Controller of Her Majesty’s Stationery Office.

© Civil Aviation Authority.

Population data used in this report are based on 2001 Census data (updated for 2010) supplied by CACI Information Services.
© CACI Ltd 2010 All Rights Reserved.
Contents

Glossary v

Executive Summary vii

1 Introduction 1
1.1 Background 1
1.2 Stansted Airport 2

2 Noise contour modelling methodology 3
2.1 ANCON noise model 3
2.2 Radar data 3
2.3 Flight tracks 3
2.4 Flight profiles 4
2.5 Noise emissions 4
2.6 Traffic distributions 5
2.7 Runway modal splits 7
2.8 Topography 8
2.9 Population and ‘Points of Interest’ databases 8

3 Noise contour results 9
3.1 Actual modal split contours 9
3.2 Standard modal split contours 10

4 Analysis of results 11
4.1 Actual modal split contours – comparison with 2009 contours 11
4.2 Standard modal split contours – comparison with 2009 contours 11
4.3 Noise contour historical trend 12

5 Conclusions 14

References 15

Tables 16
Table 1 Stansted 2009 and 2010 average summer day movements by noise class 16
Table 2 Stansted 2009 and 2010 average summer day movements by noise class and ANCON aircraft type 17

Figures 18
Figure 1 Stansted Airport and surrounding area 18
Figure 2 Stansted Airport layout in 2010 19
Figure 3 Stansted Standard Instrument Departure (SID) routes 20
Figure 4 Typical Stansted radar flight tracks 21
Figure 5 Stansted noise class trend 1988-2010 22
Figure 6 Stansted 2010 average summer day movements by ANCON type 23
Figure 7 Stansted 2009 and 2010 departure traffic distributions by route 24
Figure 8 Stansted average summer day runway modal splits 1991-2010 25
Figure 9 Topography around Stansted Airport 26
Figure 10  Population data points around Stansted Airport  27
Figure 11  Stansted 2010 actual (72% SW / 28% NE) Leq contours  28
Figure 12  Stansted 2010 standard (71% SW / 29% NE) Leq contours  29
Figure 13  Stansted 2010 actual (72% SW / 28% NE) and 2009 actual (81% SW / 19% NE) Leq contour  30
Figure 14  Stansted 2010 standard (71% SW / 29% NE) and 2009 standard (71% SW / 29% NE) Leq contours  31
Figure 15  Stansted traffic and noise contour area/population trend 1988-2010  32
Glossary

AIP Aeronautical Information Publication.

ANCON The UK civil aircraft noise contour model, developed and maintained by ERCD.

ATC Air Traffic Control.

CAA Civil Aviation Authority – the UK’s independent specialist aviation regulator.

dB Decibel units describing sound level or changes of sound level.

dBA Units of sound level on the A-weighted scale, which incorporates a frequency weighting approximating the characteristics of human hearing.

CDA Continuous Descent Approach.

DfT Department for Transport (UK Government).

ERCD Environmental Research and Consultancy Department of the Civil Aviation Authority.

Leq Equivalent sound level of aircraft noise in dBA, often called ‘equivalent continuous sound level’. For conventional historical contours this is based on the daily average movements that take place within the 16-hour period (0700-2300 local time) over the 92-day summer period from 16 June to 15 September inclusive.

NPD Noise-Power-Distance.

NPR Noise Preferential Route.

NTK Noise and Track Keeping monitoring system. The NTK system associates radar data from air traffic control radar with related data from both fixed (permanent) and mobile noise monitors at prescribed positions on the ground.

OS Ordnance Survey®, Great Britain’s national mapping agency.

SEL The Sound Exposure Level generated by a single aircraft at the measurement point, measured in dBA. This noise metric accounts for the duration of the sound as well as its intensity.

SID Standard Instrument Departure.
Executive Summary

This report presents noise exposure contours generated for London Stansted Airport for the year 2010. The noise modelling used radar and noise data from Stansted’s Noise and Track Keeping System. Mean flight tracks and dispersions for each route, and average flight profiles of aircraft height, speed and thrust for each aircraft type, were calculated.

Analysis of the 2010 summer traffic data for Stansted revealed that average daily movements decreased by 8% compared to 2009.

The area of the 2010 ‘actual’ modal split (72% south-west / 28% north-east) 57 dBA Leq contour decreased by 7% to 22.5 km², the lowest area recorded at Stansted since 1990. This can be attributed primarily to the 8% decline in total movements, of which there was a significant reduction (9%) in numbers of the B738 ANCON aircraft type. The population count within the 2010 actual 57 dBA contour also decreased, by 7%, in line with the smaller contour area.

The area of the 2010 ‘standard’ modal split (71% south-west / 29% north-east) 57 dBA Leq contour also decreased, by 6% to 22.4 km². The population count within the 57 dBA standard contour was 9% lower compared to 2009.
Intentionally blank
1 Introduction

1.1 Background

1.1.1 Each year the Environmental Research and Consultancy Department (ERCD) of the Civil Aviation Authority (CAA) calculates the noise exposure around London Stansted Airport on behalf of the Department for Transport (DfT). A computer model, ANCON, validated with noise measurements, is used to estimate the noise exposure. The model calculates the emission and propagation of noise from arriving and departing air traffic.

1.1.2 The noise exposure metric used is the Equivalent Continuous Sound Level, or Leq 16-hour (0700-2300 local time), which is calculated over the 92-day summer period from 16 June to 15 September. The background to the use of this index is explained in DORA Report 9023 (Ref 1).

1.1.3 Noise exposure is depicted in the form of noise contours, i.e. lines joining places of constant Leq, akin to the height contours shown on geographical maps or isobars on a weather chart. In the UK, Leq noise contours are normally plotted at levels from 57 to 72 dBA, in 3 dB steps. The 57 dBA level denotes the approximate onset of significant community annoyance.

1.1.4 This report contains small-scale diagrams of the year 2010 Stansted Leq contours overlaid onto Ordnance Survey® (OS) base maps. Diagrams in Adobe® PDF and AutoCAD DXF format are also available for download from the DfT website.

1.1.5 The objectives of this report are to explain the noise modelling methodology used to produce the year 2010 Leq contours for Stansted Airport, to present the calculated noise contours and to assess the changes to the contours relative to the previous year (Ref 2).

1 Aircraft noise contours are also produced on behalf of airports for the specific purpose of meeting the requirements of the Environmental Noise (England) Regulations 2006, which implemented Directive 2002/49/EC, Assessment and Management of Environmental Noise, in England. These are based on annual average values and require the use of different parameters (L_{day}, L_{evening}, L_{night}, L_{eq,16hr} and L_{den} at 5 dB steps), so it is not possible to draw meaningful conclusions between the two types of contour maps. Further details about Directive 2002/49/EC are available on the Department for Environment, Food and Rural Affairs website at www.defra.gov.uk as well as ERCD Reports 0706, 0707 and 0708, which cover Heathrow, Gatwick and Stansted noise mapping respectively.

2 www.dft.gov.uk
1.2 Stansted Airport

1.2.1 Stansted Airport is situated 35 miles (56 kilometres) north-east of London and is surrounded by countryside and small villages to the north, south and east, and by the town of Bishop’s Stortford to the west (Figure 1).

1.2.2 Stansted Airport has a single runway (04/22), which is 3,049 metres long. The landing threshold\(^3\) for Runway 04 is displaced by 300 metres. There is one main passenger terminal. The layout of the runway, taxiways and passenger terminal in 2010 is shown in Figure 2\(^4\).

1.2.3 In the 2010 calendar year there were 155,100\(^5\) aircraft movements (2009: 167,800) at Stansted Airport, handling approximately 18.6 million passengers\(^6\) (2009: 20.0 million).

1.2.4 Following the granting of planning permission for the Stansted G1 proposal on 8 October 2008, the following planning condition (Planning Condition AN1) came into force:

“The area enclosed by the 57dB(A) Leq16hr (0700-2300) contour, when calculated and measured by the Civil Aviation Authority’s Aircraft Noise Contour Model 2.3 or as may be amended, shall not exceed 33.9 sq km using the standardised average mode from the date of grant of this permission. Any necessary account shall be taken of this requirement in declaring the capacity of Stansted Airport for the purpose of Council Regulation (EEC) No 95/93 of 18 January 1993 on common rules for the allocation of slots at Community airports. Forecast aircraft movements and consequential noise contours for the forthcoming year shall be reported to the Local Planning Authority annually on the 31st January each year.”

1.2.5 Based on the above planning condition, the area of the standard (i.e. 20-year average) runway modal split 57 dBA Leq contour is not to exceed a limit of 33.9 km\(^2\).

---

\(^3\) The runway threshold marks the beginning of the runway available for landing aircraft. A displaced threshold is a runway threshold that is not located at the physical end of the runway. A displaced threshold is often employed to give arriving aircraft sufficient clearance over an obstacle.

\(^4\) UK AIP (16 Nov 10) AD 2-EGSS

\(^5\) To the nearest hundred.

\(^6\) Source: CAA Regulatory Policy Group statistics (www.caa.co.uk)
2 Noise contour modelling methodology

2.1 ANCON noise model

2.1.1 Leq noise contours were calculated with the UK civil aircraft noise model ANCON (version 2.3), which is developed and maintained by ERCD on behalf of the DfT. A technical description of ANCON is provided in ERCD Report 0606 (Ref 3). The ANCON model is also used for the production of annual contours for Heathrow and Gatwick airports, and a number of regional airports in the UK.

2.1.2 ANCON is fully compliant with the latest European guidance on noise modelling, ECAC.CEAC Doc 29 (3rd edition), published in December 2005 (Ref 4). This guidance document represents internationally agreed best practice as implemented in modern aircraft noise models.

2.2 Radar data

2.2.1 The noise modelling carried out by ERCD made extensive use of radar data extracted from Stansted Airport’s Noise and Track Keeping (NTK) system. Most large airports have NTK systems, which take data from Air Traffic Control (ATC) radars and combine them with flight information such as call sign, tail number, type and destination. Analyses of departure and arrival flight tracks, and flight profiles, were based on Stansted 2010 summer radar data.

2.3 Flight tracks

2.3.1 Aircraft departing Stansted are required to follow specific flight paths called Noise Preferential Routes (NPRs) unless directed otherwise by ATC. NPRs were designed to avoid the overflight of built-up areas where possible. They lead from the take-off runway to the main UK air traffic routes and form the first part of the Standard Instrument Departure (SID) routes. The Stansted SIDs are illustrated in Figure 3.

2.3.2 Associated with each NPR is a lateral swathe, which is defined by a pair of lines that diverge at 10 degrees from a point 2,000 metres from start-of-roll, leading to a corridor extending 1.5 kilometres either side of the nominal NPR centreline. Within this swathe the aircraft are considered to be flying on-track. The swathe takes account of various factors that affect track-keeping, including tolerances in navigational equipment, type and weight of aircraft, and weather conditions – particularly winds that may cause drifting when aircraft are turning.
reaching an altitude of 4,000 feet\(^7\) at any point along an NPR may be turned off the route by ATC onto more direct headings to their destinations – a practice known as ‘vectoring’. ATC may also vector aircraft from NPRs below this altitude for safety reasons, including in certain weather conditions (for example, to avoid storms).

2.3.3 Departure and arrival flight tracks were modelled using samples of radar data extracted from the Stansted NTK system over the 92-day summer period, 16 June to 15 September 2010. Figure 4 shows a sample of radar flight tracks from a day in August 2010. ERCD used in-house radar analysis software to calculate mean departure flight tracks and associated lateral dispersions for each NPR/SID. Arrival tracks for Runways 04 and 22 were modelled using evenly spaced ‘spurs’ about the extended runway centrelines. The majority of arriving aircraft joined the centrelines at distances between 10 and 18 kilometres from threshold for Runway 04, and between 12 and 24 kilometres from threshold for Runway 22.

2.4 Flight profiles

2.4.1 For each ANCON aircraft type, average flight profiles of height, speed and thrust versus track distance (for departures and arrivals separately) were reviewed and updated where necessary, using 2010 summer radar data. The engine power settings required for the aircraft to follow the average height and speed profiles were calculated from data describing aircraft performance characteristics within each of the different aircraft type categories.

2.4.2 Examination of the 2010 radar data indicated that, as in the preceding years, at distances greater than 10 kilometres from the runway threshold, the average aircraft heights for arrivals on Runway 04 were generally somewhat lower than on Runway 22. This follows the introduction of Continuous Descent Approach (CDA) procedures for Runway 22 arrivals via the Abbott stack from 4 November 1999 and the extension to all Runway 22 arrivals in 2000. Separate Runway 22 and Runway 04 descent profiles were therefore used to describe arrivals for all aircraft types.

2.4.3 The application of reverse thrust following touchdown was modelled for all ANCON types where applicable.

2.5 Noise emissions

2.5.1 At Stansted the NTK system captures data from both fixed and mobile noise monitors around the airport, which are then matched to operational data. The Stansted NTK system comprises eight fixed monitors (positioned approximately

\(^7\) 3,000 feet for those on the ‘Buzad’ departure routes in the period 0600-2330.
6.5 kilometres from start-of-roll), together with a number of mobile monitors that
can be deployed anywhere within the NTK radar coverage area.8

2.5.2 The noise data collected are screened by ERCD with reference to several criteria
so that only high quality data are used in the analysis. First of all, noise data that
lie outside a ‘weather window’ are discarded. This ensures that the data used are
not affected by adverse meteorological conditions such as precipitation and strong
winds. Secondly, the maximum noise level of the aircraft event must exceed the
noise monitor threshold by at least 10 dB to avoid underestimates of the Sound
Exposure Level (SEL).9 Thirdly, only measurements obtained from aircraft events
that pass through a 60-degree inverted cone, centred at the noise monitor, are
retained in order to minimise the effects of lateral attenuation10 and lateral
directivity.11

2.5.3 Noise event levels are determined from a noise database expressing SEL as a
function of engine power setting and slant distance to the receiver – the so-called
‘Noise-Power-Distance’ (NPD) relationship. The ANCON noise database is
continually reviewed and updated with adjustments made when, and where,
measurements show this to be necessary. Further information on the validation of
the ANCON noise model can be found on the CAA website.12

2.6 Traffic distributions

2.6.1 The Leq contours are based on the daily average movements that take place
during the 16-hour day (0700-2300 local time) over the 92-day period from
16 June to 15 September inclusive. The source of this information is the NTK
system, which stores radar data supplemented by daily flight plans. Traffic
statistics from NTK data were cross-checked with runway logs supplied by NATS13
and very close agreement was found.

---

8 Further information on the noise monitors can be found in ERCD Report 1004 (Ref 5).
9 The Sound Exposure Level of an aircraft noise event is the steady noise level, which over a period of one
second contains the same sound energy as the whole event. It is equivalent to the Leq of the noise event
normalised to one second.
10 Lateral attenuation is the excess sound attenuation caused by the ground surface, which can be significant
at low angles of elevation.
11 Lateral directivity is the non-uniform directionality of sound radiated laterally about the roll axis of the
aircraft – this is influenced to a large extent by the positioning of the engines.
12 http://www.caa.co.uk/docs/68/Valid_ANCON.pdf
13 NATS is the provider of air traffic control services to Stansted Airport.
Traffic distribution by noise class

2.6.2 **Table 1** lists the average summer day movements\(^\text{14}\) by eight noise classes of aircraft, ranked in ascending order of noise emission, i.e. from least to most noisy, in 2009 and 2010. There was a sizeable (22%) decrease in the numbers of large propeller aircraft (Noise Class 2) in 2010, although they only comprised a small (3%) proportion of the total movements at Stansted. As in 2009, the vast majority of movements (92%) were by short-haul ‘Chapter 3’ and ‘Chapter 4\(^\text{15}\) jet aircraft (Noise Class 3), however, their numbers declined by 8% to 378 per day in 2010.

2.6.3 There were relatively few movements by aircraft in Noise Classes 4 and 5, and almost insignificant numbers in Noise Classes 1, 6, 7 and 8.

2.6.4 The total 2010 daily movement rate for all aircraft types at Stansted over the summer period was 8% lower than in 2009.

2.6.5 **Figure 5** illustrates the changing distribution of traffic among the eight noise classes over the period from 1988 to 2010 inclusive. The increasing dominance of short-haul Chapter 3 and 4 jet movements (Noise Class 3) over the years at Stansted can be clearly seen.

Traffic distribution by ANCON aircraft type

2.6.6 A more detailed breakdown of the 2010 average summer day movements, indicating the ANCON aircraft types that fall into each noise class, is provided in **Table 2**. Comparison of the movement rates for 2009 and 2010 shows that the largest reduction by far was for the ANCON type B738\(^\text{16}\), which decreased by 24 movements (9%) per day. Movements of the EA320V\(^\text{17}\) and B733\(^\text{18}\) also fell, by 8 and 4 movements per day respectively. The largest increase in movements, which was for the B757E\(^\text{19}\), was only 3 movements per day.

2.6.7 **Figure 6** illustrates the frequency of movements by ANCON aircraft type for the 2010 average summer day. The B738 was clearly the most common ANCON aircraft type at Stansted, with 237 daily movements (58% of total movements), followed by the EA319C\(^\text{20}\), with 92 daily movements (22% of total movements).

\(^{14}\) Includes departures and arrivals.

\(^{15}\) Aircraft whose certificated noise levels are classified by the ICAO Standards and Recommended Practices – Aircraft Noise: Annex 16 to the Convention on International Civil Aviation into ‘Chapter 3’ and ‘Chapter 4’ types - these are typically characterised by modern, quieter, high-bypass turbofan aircraft.

\(^{16}\) B738 = Boeing 737-800/900 series

\(^{17}\) EA320V = Airbus A320 with IAE-V2500 engines

\(^{18}\) B733 = Boeing 737-300/400/500 series

\(^{19}\) B757E = Boeing 757-200 with Rolls Royce RB211 engines

\(^{20}\) EA319C = Airbus A319 with CFM-56 engines
2.6.8 The B738 was the noise dominant ANCON type at Stansted because it was responsible for the highest contribution of 'noise energy', which is a function of both aircraft noise level and movement numbers.

Traffic distribution by SID route

2.6.9 Figure 7 shows the distribution of departing aircraft by SID route for 2010, including figures from 2009 for comparison. As in the previous year, the Runway 22 BUZ/BKY/CPT SIDs took the highest proportion of departure traffic over the summer period (about 36%); however, the percentage loadings on this and one other south-westerly route (DVR/LAM/LYD) were both 3% lower compared to 2009. All the north-easterly routes experienced higher traffic loadings in 2010.

2.7 Runway modal splits

2.7.1 In general, aircraft will take-off and land into a headwind to maximise lift during take-off and maximise deceleration upon landing. The wind direction, which varies over the course of a year, will therefore have an important influence on the usage of runways. The ratio of south-westerly (i.e. Runway 22) and north-easterly (i.e. Runway 04) operations is referred to as the runway modal split.

2.7.2 To remove the effect of year-on-year weather fluctuations on aircraft operations and to clarify underlying trends, two sets of contours have been produced for the year 2010:

(i) Contours using the ‘actual’ modal split over the Leq period; and

(ii) Contours assuming the ‘standard’ modal split over the Leq period, i.e. the long-term modal split calculated from the 20-year rolling average; for 2010, this is the 20-year period from 1991 to 2010. Use of the standard modal split enables year-on-year comparisons without the runway usage affecting the contour shape.

2.7.3 The actual and standard modal splits for 2010, together with the previous year, are summarised in the following table:

<table>
<thead>
<tr>
<th>Modal split scenario</th>
<th>% south-west (Runway 22)</th>
<th>% north-east (Runway 04)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual 2010</td>
<td>72%</td>
<td>28%</td>
</tr>
<tr>
<td>Actual 2009</td>
<td>81%</td>
<td>19%</td>
</tr>
<tr>
<td>Standard 2010</td>
<td>71%</td>
<td>29%</td>
</tr>
<tr>
<td>Standard 2009</td>
<td>71%</td>
<td>29%</td>
</tr>
</tbody>
</table>
2.7.4 It can be seen that in 2010 the proportion of south-westerly movements (Runway 22) reduced significantly, by 9%, compared to the previous year. The 2010 actual modal split was almost the same as the 2010 standard modal split, which was unchanged from 2009. Historical runway modal splits at Stansted for the past 20 years are summarised in Figure 8.

2.8 Topography

2.8.1 The topography around Stansted Airport was modelled by accounting for terrain height. This was achieved by geometrical corrections for source-receiver distance and elevation angles. Other, more complex effects, such as lateral attenuation from uneven ground surfaces and noise screening/reflection effects due to topographical features, were not taken into account.

2.8.2 ERCD holds OS terrain height data\(^{21}\) on a 200-metre by 200-metre grid for the whole of England. Interpolation was performed to generate height data at each of the calculation points on the receiver grid used by the ANCON noise model. The terrain heights in the vicinity of Stansted Airport are depicted diagrammatically in Figure 9.

2.9 Population and ‘Points of Interest’ databases

2.9.1 Estimates were made of the numbers of people enclosed within the noise contours. The population data used in this report are a 2010 update of the 2001 Census supplied by CACI Limited\(^{22}\). The CACI population database contains data referenced at the postcode level. Population numbers associated with each postcode are assigned to a single co-ordinate located at the postcode’s centroid. The population data points for the area around Stansted Airport are illustrated in Figure 10.

2.9.2 This year, for the first time, the estimated numbers of households within the contours are also provided.

2.9.3 Estimates have been made of the numbers of noise sensitive buildings situated within the contours, using the PointX\(^{23}\) ‘Points of Interest’ database (2010). For the purposes of this study, the noise sensitive buildings that have been considered are schools, hospitals and places of worship.

\(^{21}\) Meridian\(^{\text{TM}}\) 2
\(^{22}\) www.caci.co.uk
\(^{23}\) PointX is a joint venture company set up by Ordnance Survey and Landmark Information Group.
3 Noise contour results

3.1 Actual modal split contours

3.1.1 The Stansted 2010 Leq noise contours generated with the actual 2010 summer period runway modal split (72% south-west / 28% north-east) are shown in Figure 11. The contours are plotted from 57 to 72 dBA at 3 dB intervals.

3.1.2 The cumulative areas, populations and households within the contours are listed in the table below:

<table>
<thead>
<tr>
<th>Leq contour level (dBA)</th>
<th>Area (km²)</th>
<th>Population</th>
<th>Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 57</td>
<td>22.5</td>
<td>1,400</td>
<td>550</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>12.0</td>
<td>550</td>
<td>200</td>
</tr>
<tr>
<td>&gt; 63</td>
<td>6.4</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>&gt; 66</td>
<td>3.3</td>
<td>&lt; 50</td>
<td>&lt; 50</td>
</tr>
<tr>
<td>&gt; 69</td>
<td>1.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 72</td>
<td>1.1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: Populations and households are given to the nearest 50.

3.1.3 Estimates of the cumulative numbers of noise sensitive buildings within the actual modal split contours are listed in the table below:

<table>
<thead>
<tr>
<th>Leq contour level (dBA)</th>
<th>Schools</th>
<th>Hospitals</th>
<th>Places of worship</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 57</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 63</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 66</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 69</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 72</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
3.2 **Standard modal split contours**

3.2.1 The Stansted 2010 Leq noise contours generated with the standard 2010 summer period runway modal split (71% south-west / 29% north-east) are shown in Figure 12. The contours are plotted from 57 to 72 dBA at 3 dB intervals.

3.2.2 The cumulative areas, populations and households within the contours are listed in the table below:

<table>
<thead>
<tr>
<th>Leq contour level (dBA)</th>
<th>Area (km²)</th>
<th>Population</th>
<th>Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 57</td>
<td>22.4</td>
<td>1,450</td>
<td>550</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>12.0</td>
<td>550</td>
<td>200</td>
</tr>
<tr>
<td>&gt; 63</td>
<td>6.4</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>&gt; 66</td>
<td>3.3</td>
<td>&lt; 50</td>
<td>&lt; 50</td>
</tr>
<tr>
<td>&gt; 69</td>
<td>1.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 72</td>
<td>1.1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: Populations and households are given to the nearest 50.

3.2.3 Estimates of the cumulative numbers of noise sensitive buildings within the standard modal split contours are listed in the table below:

<table>
<thead>
<tr>
<th>Leq contour level (dBA)</th>
<th>Schools</th>
<th>Hospitals</th>
<th>Places of worship</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 57</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 63</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 66</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 69</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 72</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
4 Analysis of results

4.1 Actual modal split contours – comparison with 2009 contours

4.1.1 The Stansted 2010 actual modal split Leq contours are compared against the 2009 actual Leq contours in Figure 13. The table below summarises the areas, populations and percentage changes from 2009 to 2010:

Stansted actual modal split contours: areas and populations for 2009 and 2010

<table>
<thead>
<tr>
<th>Leq (dBA)</th>
<th>2009 Area (km²)</th>
<th>2010 Area (km²)</th>
<th>Area change (%)</th>
<th>2009 Pop.</th>
<th>2010 Pop.</th>
<th>Pop. change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 57</td>
<td>24.1</td>
<td>22.5</td>
<td>-7%</td>
<td>1,500</td>
<td>1,400</td>
<td>-7%</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>12.9</td>
<td>12.0</td>
<td>-7%</td>
<td>550</td>
<td>550</td>
<td>0%</td>
</tr>
<tr>
<td>&gt; 63</td>
<td>6.9</td>
<td>6.4</td>
<td>-7%</td>
<td>250</td>
<td>100</td>
<td>-60%</td>
</tr>
<tr>
<td>&gt; 66</td>
<td>3.6</td>
<td>3.3</td>
<td>-8%</td>
<td>&lt; 50</td>
<td>&lt; 50</td>
<td>(n/a)</td>
</tr>
<tr>
<td>&gt; 69</td>
<td>1.9</td>
<td>1.8</td>
<td>-5%</td>
<td>0</td>
<td>0</td>
<td>(n/a)</td>
</tr>
<tr>
<td>&gt; 72</td>
<td>1.1</td>
<td>1.1</td>
<td>0%</td>
<td>0</td>
<td>0</td>
<td>(n/a)</td>
</tr>
</tbody>
</table>

Note: The actual modal split was 81% SW / 19% NE in 2009 and 72% SW / 28% NE in 2010.

4.1.2 Relative to 2009, most of the contour areas decreased by up to 8%. This can be attributed to the 8% reduction in total daily movements. In particular, movements of the noise dominant B738 ANCON aircraft type (Noise Class 3) fell by 9%, offset to a small extent by some rises in numbers of Noise Class 4 and 5 aircraft types.

4.1.3 Populations enclosed within the actual contours also decreased as a result of the smaller contour areas. It should be noted that percentage changes in contour areas are not necessarily accompanied by similar changes in enclosed population because of unevenly distributed populations around the airport.

4.2 Standard modal split contours – comparison with 2009 contours

4.2.1 The Stansted 2010 standard modal split Leq contours are compared against the 2009 standard Leq contours in Figure 14. The following table summarises the areas, populations and percentage changes from 2009 to 2010:
### Stansted standard modal split contours: areas and populations for 2009 and 2010

<table>
<thead>
<tr>
<th>Leq (dBA)</th>
<th>2009 Area (km²)</th>
<th>2010 Area (km²)</th>
<th>Area change (%)</th>
<th>2009 Pop.</th>
<th>2010 Pop.</th>
<th>Pop. change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 57</td>
<td>23.9</td>
<td>22.4</td>
<td>-6%</td>
<td>1,600</td>
<td>1,450</td>
<td>-9%</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>12.8</td>
<td>12.0</td>
<td>-6%</td>
<td>600</td>
<td>550</td>
<td>-8%</td>
</tr>
<tr>
<td>&gt; 63</td>
<td>6.8</td>
<td>6.4</td>
<td>-6%</td>
<td>200</td>
<td>100</td>
<td>-50%</td>
</tr>
<tr>
<td>&gt; 66</td>
<td>3.6</td>
<td>3.3</td>
<td>-8%</td>
<td>&lt; 50</td>
<td>&lt; 50</td>
<td>(n/a)</td>
</tr>
<tr>
<td>&gt; 69</td>
<td>1.9</td>
<td>1.8</td>
<td>-5%</td>
<td>0</td>
<td>0</td>
<td>(n/a)</td>
</tr>
<tr>
<td>&gt; 72</td>
<td>1.1</td>
<td>1.1</td>
<td>0%</td>
<td>0</td>
<td>0</td>
<td>(n/a)</td>
</tr>
</tbody>
</table>

Note: The standard modal splits in 2009 and 2010 were both 71% SW / 29% NE.

4.2.2 Relative to 2009, nearly all the contour areas have decreased by up to 8%. This can be explained by the 8% reduction in movements, most of which occurred within Noise Class 3, e.g. for the ANCON aircraft type B738.

4.2.3 Populations enclosed within the standard contours also decreased. The area of the 2010 57 dB(A) Leq standard modal split contour of 22.4 km² is 11.5 km² below the Planning Condition AN1 contour area limit of 33.9 km² (see section 1.2.4).

4.3 **Noise contour historical trend**

4.3.1 Figure 15 shows how the actual 57 dBA Leq contour has changed in area and population terms since 1988 by comparison with the total annual (365-day) aircraft movements. (Actual modal split data are used in this figure because standard modal split contours were not produced prior to 1995).

**Movements**

4.3.2 Annual movements at Stansted rose steadily between 1990 and 2001 showing particularly rapid growth between 1997 and 1999. The number of movements in 2001 and 2002 were similar but in 2003 the annual figure rose by 9% over the preceding year. Another rise in 2006 was followed by a slight increase in the annual figure in 2007, representing a peak level.

4.3.3 The total annual movement figure for 2008 dropped by 7% – this can be attributed to the economic downturn and fluctuating oil price. The figure dropped even further in 2009, by 13%, as the global recession continued to impact upon the aviation industry.

4.3.4 Year 2010 saw another large fall in traffic for the third year running, this time by 8%. The volcanic ash crisis in April, industrial action in May, adverse winter weather and a continued reduction in demand for leisure travel are likely causes for the decline in traffic.
Areas and populations

4.3.5 Up to 1998, areas and populations within the 57 dBA Leq contour have generally risen in line with movements but in 1999, despite the high traffic growth, the area fell by 19%. This decrease was attributable to fewer movements of older, noisier, Chapter 2 aircraft – in particular those by the BAC 1-11 which fell by 64% in that year.

4.3.6 Areas have been generally steady since 2001 following completion of the phase-out of Chapter 2 aircraft. There was a 7% decrease in traffic in 2008 and the area fell by 6% relative to 2007. The area further reduced in 2009 and again in 2010 as total movements dropped substantially. The 2010 area was the lowest since 1990.

4.3.7 From 2001 to 2008, population counts fluctuated within a range from approximately 2,000 to 2,900. The years with higher proportions of south-westerly movements have tended to produce the higher population counts. In 2009 the shift in modal split to a lower proportion of south-westerly movements along with significantly lower movement numbers caused the population count to dip markedly. The 2010 population count fell again in line with the 7% reduction in area.
5 Conclusions

5.1 Year 2010 average summer 16-hour day Leq noise exposure contours have been generated for Stansted Airport using the ANCON noise model.

5.2 The results show that the actual modal split 57 dBA Leq contour area decreased by 7% from 24.1 km$^2$ in 2009 to 22.5 km$^2$ in 2010. The reduction in area can be attributed primarily to the 8% drop in movements in 2010. In particular, there were significant reductions in movements of the noise dominant B738 ANCON aircraft type. The 2010 area of 22.5 km$^2$ is the lowest recorded at Stansted since 1990. Populations enclosed within the actual 57 dBA Leq contour dropped by 7% in line with the smaller contour area.

5.3 The 57 dBA Leq standard contour area decreased by 6% to 22.4 km$^2$, which is well within the 33.9 km$^2$ contour area limit imposed by the Stansted G1 planning condition. The population count within the standard contour also fell, by 9%.
References

1  Critchley J B, Ollerhead J B  
   The Use of $Leq$ as an Aircraft Noise Index  
   DORA Report 9023, September 1990

2  Lee J, Beaton D, Edmonds L, Patel J  
   Noise Exposure Contours for Stansted Airport 2009  
   ERCD Report 1003, March 2010

3  Rhodes D P  
   The UK Civil Aircraft Noise Contour Model: ANCON version 2.3  
   ERCD Report 0606 (to be published)

4  European Civil Aviation Conference  
   Report on Standard Method of Computing Noise Contours around Civil Airports  
   ECAC.CEAC Doc 29, 3rd edition, Volumes 1 & 2, December 2005

5  White S, Beaton D  
   Noise Monitor Positions at Heathrow, Gatwick and Stansted Airports  
   ERCD Report 1004 (2nd edition), December 2010
Table 1  Stansted 2009 and 2010 average summer day movements by noise class

<table>
<thead>
<tr>
<th>Noise Class</th>
<th>Description</th>
<th>2009</th>
<th>2010</th>
<th>Percentage of total 2010 movements</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;PROPELLER AIRCRAFT&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Small propeller aircraft</td>
<td>0.5</td>
<td>0.6</td>
<td>0.1%</td>
<td>+0.1 (*)</td>
</tr>
<tr>
<td>2</td>
<td>Large propeller aircraft</td>
<td>17.9</td>
<td>14.0</td>
<td>3.4%</td>
<td>-3.9 (-22%)</td>
</tr>
<tr>
<td></td>
<td>&lt;CHAPTER 3/4 JETS&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Short-haul aircraft</td>
<td>411.6</td>
<td>378.0</td>
<td>92.3%</td>
<td>-33.6 (-8%)</td>
</tr>
<tr>
<td>4</td>
<td>Wide-body twin-engine aircraft</td>
<td>3.9</td>
<td>4.8</td>
<td>1.2%</td>
<td>+0.9 (+22%)</td>
</tr>
<tr>
<td>5</td>
<td>2nd generation wide-body 3.4-engine aircraft</td>
<td>8.9</td>
<td>11.5</td>
<td>2.8%</td>
<td>+2.6 (+30%)</td>
</tr>
<tr>
<td></td>
<td>&lt;LARGE CHAPTER 2/3 JETS&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1st generation wide-body 3.4-engine aircraft</td>
<td>0.3</td>
<td>0.2</td>
<td>0.0%</td>
<td>-0.1 (*)</td>
</tr>
<tr>
<td></td>
<td>&lt;2nd GENERATION TWIN JETS&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Narrow-body twin-engine (including Ch.2 and hushkitted versions)</td>
<td>0.4</td>
<td>0.2</td>
<td>0.0%</td>
<td>-0.2 (*)</td>
</tr>
<tr>
<td></td>
<td>&lt;1st GENERATION JETS&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Narrow-body 3.4-engine aircraft</td>
<td>0.3</td>
<td>0.2</td>
<td>0.0%</td>
<td>-0.1 (*)</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>443.9</td>
<td>409.4</td>
<td>100%</td>
<td>-34.5 (-8%)</td>
</tr>
</tbody>
</table>

* Percentage changes not shown due to low numbers and limited data resolution.

Note: Totals may not sum exactly due to rounding.
Table 2  Stansted 2009 and 2010 average summer day movements by noise class and ANCON aircraft type

<table>
<thead>
<tr>
<th>Aircraft type</th>
<th>Noise class</th>
<th>ANCON type</th>
<th>2009</th>
<th>2010</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single piston propeller</td>
<td>1</td>
<td>SP</td>
<td>0.2</td>
<td>&lt; 0.1</td>
<td>-0.2</td>
</tr>
<tr>
<td>Small twin-piston propeller</td>
<td>1</td>
<td>STP</td>
<td>0.3</td>
<td>&lt; 0.1</td>
<td>-0.3</td>
</tr>
<tr>
<td>Small twin-turboprop</td>
<td>1</td>
<td>STT</td>
<td>0.1</td>
<td>0.5</td>
<td>+0.4</td>
</tr>
<tr>
<td>Large twin-turboprop</td>
<td>2</td>
<td>LTT</td>
<td>17.9</td>
<td>13.9</td>
<td>-4.0</td>
</tr>
<tr>
<td>Large four-engine propeller</td>
<td>2</td>
<td>L4P</td>
<td>&lt; 0.1</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Boeing 737-300/400/500</td>
<td>3</td>
<td>B733</td>
<td>7.5</td>
<td>3.1</td>
<td>-4.4</td>
</tr>
<tr>
<td>Boeing 737-600/700</td>
<td>3</td>
<td>B736</td>
<td>5.6</td>
<td>3.5</td>
<td>-2.1</td>
</tr>
<tr>
<td>Boeing 737-800/900</td>
<td>3</td>
<td>B738</td>
<td>0.3</td>
<td>13.1</td>
<td>-12.8</td>
</tr>
<tr>
<td>Boeing 757-200 (RB211-535E4/E4B engines)</td>
<td>3</td>
<td>B757E</td>
<td>1.9</td>
<td>5.2</td>
<td>+3.3</td>
</tr>
<tr>
<td>Boeing 757-200 (PW2037/2040 engines)</td>
<td>3</td>
<td>B757P</td>
<td>&lt; 0.1</td>
<td>0.2</td>
<td>+0.2</td>
</tr>
<tr>
<td>BAe 146/Avro RJ</td>
<td>3</td>
<td>BA46</td>
<td>3.0</td>
<td>4.4</td>
<td>+1.4</td>
</tr>
<tr>
<td>Airbus A318</td>
<td>3</td>
<td>EA318</td>
<td>0.0</td>
<td>0.1</td>
<td>+0.1</td>
</tr>
<tr>
<td>Airbus A319 (CFM-56 engines)</td>
<td>3</td>
<td>EA319C</td>
<td>93.1</td>
<td>92.0</td>
<td>-1.1</td>
</tr>
<tr>
<td>Airbus A319 (IAE-V2500 engines)</td>
<td>3</td>
<td>EA319V</td>
<td>6.2</td>
<td>8.8</td>
<td>+2.6</td>
</tr>
<tr>
<td>Airbus A320 (CFM-56 engines)</td>
<td>3</td>
<td>EA320C</td>
<td>6.2</td>
<td>6.9</td>
<td>+0.7</td>
</tr>
<tr>
<td>Airbus A320 (IAE-V2500 engines)</td>
<td>3</td>
<td>EA320V</td>
<td>10.5</td>
<td>3.0</td>
<td>-7.5</td>
</tr>
<tr>
<td>Airbus A321 (CFM56 engines)</td>
<td>3</td>
<td>EA321C</td>
<td>1.6</td>
<td>&lt; 0.1</td>
<td>-1.6</td>
</tr>
<tr>
<td>Airbus A321 (IAE-V2500 engines)</td>
<td>3</td>
<td>EA321V</td>
<td>2.0</td>
<td>1.4</td>
<td>-0.6</td>
</tr>
<tr>
<td>Executive Business Jet (Chapter 3)</td>
<td>3</td>
<td>EXE3</td>
<td>9.9</td>
<td>9.7</td>
<td>-0.2</td>
</tr>
<tr>
<td>Bombardier Regional Jet 100/200</td>
<td>3</td>
<td>CRJ</td>
<td>0.1</td>
<td>0.0</td>
<td>-0.1</td>
</tr>
<tr>
<td>Embraer ERJ 135/145</td>
<td>3</td>
<td>ERJ</td>
<td>1.9</td>
<td>1.5</td>
<td>-0.4</td>
</tr>
<tr>
<td>Embraer ERJ 170</td>
<td>3</td>
<td>ERJ170</td>
<td>0.0</td>
<td>0.1</td>
<td>+0.1</td>
</tr>
<tr>
<td>Embraer ERJ 190</td>
<td>3</td>
<td>ERJ190</td>
<td>&lt; 0.1</td>
<td>0.3</td>
<td>+0.3</td>
</tr>
<tr>
<td>McDonnell Douglas MD80 series</td>
<td>3</td>
<td>MD80</td>
<td>0.6</td>
<td>0.2</td>
<td>-0.4</td>
</tr>
<tr>
<td>McDonnell Douglas MD90 series</td>
<td>3</td>
<td>MD90</td>
<td>0.0</td>
<td>&lt; 0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Boeing 767-200</td>
<td>4</td>
<td>B762</td>
<td>0.3</td>
<td>1.1</td>
<td>+0.8</td>
</tr>
<tr>
<td>Boeing 767-300 (GE CF6-80 engines)</td>
<td>4</td>
<td>B763G</td>
<td>1.6</td>
<td>2.1</td>
<td>+0.5</td>
</tr>
<tr>
<td>Boeing 767-300 (PW4000 engines)</td>
<td>4</td>
<td>B763P</td>
<td>0.1</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Boeing 777-200 (GE GE90 engines)</td>
<td>4</td>
<td>B772G</td>
<td>0.1</td>
<td>0.2</td>
<td>+0.1</td>
</tr>
<tr>
<td>Airbus A300</td>
<td>4</td>
<td>EA30</td>
<td>1.7</td>
<td>1.2</td>
<td>-0.5</td>
</tr>
<tr>
<td>Airbus A310</td>
<td>4</td>
<td>EA31</td>
<td>&lt; 0.1</td>
<td>&lt; 0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Airbus A330</td>
<td>4</td>
<td>EA33</td>
<td>&lt; 0.1</td>
<td>0.1</td>
<td>+0.1</td>
</tr>
<tr>
<td>Airbus A340-200/300</td>
<td>5</td>
<td>EA34</td>
<td>0.9</td>
<td>1.9</td>
<td>+1.0</td>
</tr>
<tr>
<td>Boeing 747-400 (GE CF6-80F engines)</td>
<td>5</td>
<td>B744G</td>
<td>2.7</td>
<td>3.9</td>
<td>+1.2</td>
</tr>
<tr>
<td>Boeing 747-400 (PW4000 engines)</td>
<td>5</td>
<td>B744P</td>
<td>0.3</td>
<td>0.6</td>
<td>+0.3</td>
</tr>
<tr>
<td>Boeing 747SP</td>
<td>5</td>
<td>B747SP</td>
<td>0.1</td>
<td>0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>McDonnell Douglas MD-11</td>
<td>5</td>
<td>MD11</td>
<td>4.9</td>
<td>5.1</td>
<td>+0.2</td>
</tr>
<tr>
<td>Boeing 747-100/200/300</td>
<td>6</td>
<td>B747</td>
<td>0.3</td>
<td>0.1</td>
<td>-0.2</td>
</tr>
<tr>
<td>McDonnell Douglas DC-10</td>
<td>6</td>
<td>DC10</td>
<td>&lt; 0.1</td>
<td>0.1</td>
<td>+0.1</td>
</tr>
<tr>
<td>McDonnell Douglas DC-9 (Chapter 3)</td>
<td>7</td>
<td>DC9</td>
<td>&lt; 0.1</td>
<td>&lt; 0.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Executive Business Jet (Chapter 2)</td>
<td>7</td>
<td>EXE2</td>
<td>0.2</td>
<td>0.0</td>
<td>-0.2</td>
</tr>
<tr>
<td>Boeing 707, McDonnell Douglas DC-8</td>
<td>8</td>
<td>DC8</td>
<td>0.1</td>
<td>0.0</td>
<td>-0.1</td>
</tr>
<tr>
<td>Boeing 727 (Chapter 3)</td>
<td>8</td>
<td>B727</td>
<td>0.2</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>443.9</td>
<td>409.4</td>
<td>-34.5</td>
<td>(-8%)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Totals may not sum exactly due to rounding.
Figure 1  Stansted Airport and surrounding area
Figure 2
Stansted Airport layout in 2010
Figure 3   Stansted Standard Instrument Departure (SID) routes
Figure 4  Typical Stansted radar flight tracks
**Figure 5** Stansted noise class trend 1988-2010

![Graph showing the trend of noise class distribution at Stansted Airport from 1988 to 2010. The graph illustrates the percentage of traffic for different noise classes over time, with labels for each noise class and a key to the noise classes below the graph.](image)

Note: The percentages from 1990 onwards relate to the average 16-hour Leq day; before 1990 the percentages relate to the average 12-hour NNI day (0700-1900 local time). Also, the percentages before 1992 are based on departures only, from 1992 they relate to total movements.

**Key to noise classes**

*Propeller aircraft*
1. Small props, e.g. single/twin piston and turboprop light aircraft
2. Large props, e.g. 2- and 4-propeller transports, e.g. ATR-42, BAe ATP

*Chapter 3/4 jets*
3. Short-haul, e.g. Airbus A320, Boeing 737-300
4. Wide-body twins, e.g. Airbus A300, Boeing 767
5. 2nd generation wide-body 3,4-engine aircraft, e.g. Airbus A340, Boeing 747-400

*Large Chapter 2/3 jets*
6. 1st generation wide-body 3,4-engine aircraft, e.g. Boeing 747-200

*2nd generation twin jets*
7. Narrow body twins (including hushkitted versions), e.g. Boeing 737-200, Fokker 28

*1st generation jets (including hushkitted versions)*
8. Narrow body 3,4-engine aircraft, e.g. Boeing 707, Tupolev Tu-154
Figure 6  Stansted 2010 average summer day movements by ANCON type

Note: ANCON types are listed in the same order as in Table 2.
**Figure 7** Stansted 2009 and 2010 departure traffic distributions by route

- **04 BUZ/BKY/CPT**
  - 2009 = 9%
  - 2010 = 13% (+4%)
- **04 CLN**
  - 2009 = 0%
  - 2010 = 7% (+2%)
- **04 DVR/LAM/LYD**
  - 2009 = 0%
  - 2010 = 7% (+1%)
- **22 BUZ/BKY/CPT**
  - 2009 = 39%
  - 2010 = 36% (-3%)
- **22 CLN**
  - 2009 = 18%
  - 2010 = 18% (0%)
- **22 DVR/LAM/LYD**
  - 2009 = 22%
  - 2010 = 19% (-3%)

2009 TOTAL 04 DEPARTURES = 20%
2010 TOTAL 04 DEPARTURES = 26% (+6%)

Note: Totals may not sum exactly due to rounding of percentages on individual routes.

2009 TOTAL 22 DEPARTURES = 80%
2010 TOTAL 22 DEPARTURES = 72% (-8%)

Note: Totals may not sum exactly due to rounding of percentages on individual routes.
Figure 8  Stansted average summer day runway modal splits 1991-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>South-westerly operations (%)</th>
<th>North-easterly operations (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>73</td>
<td>27</td>
</tr>
<tr>
<td>1992</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>1993</td>
<td>68</td>
<td>32</td>
</tr>
<tr>
<td>1994</td>
<td>72</td>
<td>28</td>
</tr>
<tr>
<td>1995</td>
<td>53</td>
<td>47</td>
</tr>
<tr>
<td>1996</td>
<td>62</td>
<td>38</td>
</tr>
<tr>
<td>1997</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>1998</td>
<td>82</td>
<td>18</td>
</tr>
<tr>
<td>1999</td>
<td>63</td>
<td>37</td>
</tr>
<tr>
<td>2000</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>2001</td>
<td>71</td>
<td>29</td>
</tr>
<tr>
<td>2002</td>
<td>64</td>
<td>36</td>
</tr>
<tr>
<td>2003</td>
<td>67</td>
<td>33</td>
</tr>
<tr>
<td>2004</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>2005</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>2006</td>
<td>66</td>
<td>34</td>
</tr>
<tr>
<td>2007</td>
<td>72</td>
<td>28</td>
</tr>
<tr>
<td>2008</td>
<td>89</td>
<td>11</td>
</tr>
<tr>
<td>2009</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>2010</td>
<td>72</td>
<td>28</td>
</tr>
</tbody>
</table>

20-year average: 71% SW, 29% NE
Figure 9  Topography around Stansted Airport

This diagram indicates the terrain heights around Stansted Airport. The lowest heights are indicated by the yellow shading, and the highest by the dark blue areas. The heights shown on this map range from approximately 25 to 141 metres above sea level.
Figure 10  Population data points around Stansted Airport

Each orange dot represents a population data point associated with an individual postcode.

© Crown Copyright and database right 2011.
Ordnance Survey Licence number 100016105
Figure 11  Stansted 2010 actual (72% SW / 28% NE) Leq contours
Figure 12  Stansted 2010 standard (71% SW / 29% NE) Leq contours
Figure 13  Stansted 2010 actual (72% SW / 28% NE) and 2009 actual (81% SW / 19% NE) Leq contours
Figure 14  Stansted 2010 standard (71% SW / 29% NE) and 2009 standard (71% SW / 29% NE) Leq contours
Figure 15
Stansted traffic and noise contour area/population trend 1988-2010

- MOVEMENTS (thousands) per annum
- AREA (km²) within 57 dBA actual contour
- POPULATION (hundreds) within 57 dBA actual contour

Year:
- 1988
- 1989
- 1990
- 1991
- 1992
- 1993
- 1994
- 1995
- 1996
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010