Environmental Research and Consultancy Department
Civil Aviation Authority

ERCD REPORT 1602

Noise Exposure Contours for Gatwick Airport 2015

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Prepared by the Civil Aviation Authority on behalf of the Department for Transport, January 2017

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Summary

This report presents the year 2015 average summer day and night noise exposure contours for London Gatwick Airport.

The 57 dBA Leq day contour area for 2015 based on the actual runway modal split (74% west / 26% east) was calculated to be 42.8 km^2, 1% higher than the year before (2014: 42.2 km^2). The population enclosed increased by 11% to 3,650 (2014: 3,300).

The 48 dBA Leq night actual modal split (74% west / 26% east) contour area for 2015 was 104.7 km^2, 1% higher than the previous year (2014: 103.5 km^2). The enclosed population was 14,400 (2014: 12,850), an increase of 12%.

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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.

Population data used in this report are based on 2011 Census data (updated for 2015) supplied by CACI Information Services.

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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.

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 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.

SID Standard Instrument Departure

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Executive Summary

This report presents the year 2015 average summer day and night noise exposure contours generated for London Gatwick Airport.

The noise modelling used radar and noise data from Gatwick's Noise and Track Keeping (NTK) system. Mean flight tracks and lateral dispersions for each route, and average flight profiles of aircraft height, speed and thrust for each aircraft type, were calculated using these data.

Analysis of the 2015 summer traffic data for Gatwick revealed that average daily movements for the 16-hour daytime period (742.5) were 4% higher than in the previous year (2014: 715.6). There were on average 125.2 movements per 8-hour night over the 2015 summer period, an increase of 2% on the 2014 total (123.1).

The area of the 2015 day actual modal split (74% west / 26% east) 57 dBA Leq contour increased by 1% to 42.8 km^2 (2014: 42.2 km^2). This area increase was a result of the 4% higher number of movements in 2015, which were offset to a large extent by noise adjustments to some of the ANCON aircraft types to better reflect noise measurements from 2014 and 2015. The population count within the 2015 day actual 57 dBA contour increased by 11% to 3,650 (2014: 3,300), largely due to an extension of the contour over Lingfield.

The area of the 2015 day standard modal split (74% west / 26% east) 57 dBA Leq contour increased by 1% to 42.8 km^2 (2014: 42.3 km^2). The 2015 standard and actual modal splits were the same. The population count within the 2015 day standard 57 dBA contour was 3,650, a decrease of 1% from the year before (2014: 3,700).

The area of the 2015 night actual modal split (74% west / 26% east) 48 dBA Leq contour was 104.7 km^2, an increase of 1% (2014: 103.5 km^2). The contour enclosed a population of 14,400, which was a 12% rise from the previous year (2014: 12,850). The population increase can be mainly attributed to the changes in contour shape following the shift to a runway modal split closer to that in 2013. In particular, the contour extended over Capel to the west of the airport, and also to the east, in the area around Edenbridge and Hever.

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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 Gatwick 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.[1] The 57 dBA level denotes the approximate onset of significant community annoyance.

1.1.4 Following the publication of the Aviation Policy Framework in March 2013 (**Ref 2**), there is now a commitment by the DfT to produce night (2300-0700 local time) noise contours on an annual basis for the designated airports. Night-time 8-hour Leq contours have therefore been calculated for Gatwick from 48 to 72 dBA in 3 dB steps in accordance with standard practice. Average summer night contours were first calculated for Gatwick for the year 2013.

1.1.5 This report contains small-scale diagrams of the year 2015 Gatwick Leq contours overlaid onto Ordnance Survey® (OS) base maps. Larger-scale diagrams in Adobe® PDF format and AutoCAD® DXF format contours (for specialist users) are also available for download from the GOV.UK website.[2]

1.1.6 The objectives of this report are to explain the noise modelling methodology used to produce the year 2015 day and night Leq contours for Gatwick Airport, to present the calculated noise contours and to assess the changes from the previous year (**Ref 3**). Long-term trends are also examined.

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[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.gov.uk/defra* as well as ERCD Reports 1204, 1205 and 1206 (available from *www.caa.co.uk*), which cover Heathrow, Gatwick and Stansted 2011 noise mapping respectively.

[2] https://www.gov.uk/government/publications/noise-exposure-contours-around-london-airports

1.2 Gatwick Airport

1.2.1 Gatwick Airport is located approximately 28 miles (45 km) south of London and about 2 miles (3 km) north of Crawley. Aside from the nearby towns of Crawley and Horley it is situated in mostly lightly populated countryside (**Figure 1**).

1.2.2 Gatwick Airport has one main runway, designated 08R/26L, which is 3,316 m long. The Runway 26L landing threshold[3] is displaced by 424 m, and the Runway 08R landing threshold displaced by 393 m. There is also one standby runway (08L/26R) that can be used if the main runway is out of operation, for example, due to maintenance work. There are two passenger terminals. The layout of the runways, taxiways and passenger terminals in 2015 is shown in **Figure 2**.[4]

1.2.3 In the 2015 calendar year there were approximately 268,000 aircraft movements at Gatwick (2014: 260,000) and the airport handled 40.3 million passengers (2014: 38.1 million).[5]

[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 (28 May 2015) AD 2-EGKK-2-1

[5] Source: Civil Aviation Authority (www.caa.co.uk/airportstatistics)

2 Noise contour modelling methodology

2.1 ANCON noise model

2.1.1 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 R&D Report 9842 (**Ref 4**). The ANCON model is also used for the production of annual contours for Heathrow and Stansted airports, and a number of other UK airports.

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 5**). 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 Gatwick 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, aircraft registration, aircraft type and destination. Analyses of departure and arrival flight tracks, and flight profiles, were based on year 2015 summer radar data.

2.3 Flight tracks

2.3.1 Aircraft departing Gatwick 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 establish a path 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 Gatwick NPR/SID routes 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 m from start-of-roll, leading to a corridor extending 1.5 km 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. Aircraft reaching an altitude of 4,000 ft 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, to avoid storms for example.

2.3.3 Departure and arrival flight tracks were modelled using radar data extracted from the Gatwick NTK system over the 92-day summer period, 16 June to 15 September 2015. Mean flight tracks were calculated from 24-hour data since both day and night contours were being produced.

2.3.4 **Figure 4** shows a sample of radar flight tracks from a day in August 2015. In-house radar analysis software was used to calculate mean departure flight tracks and associated lateral dispersions for each NPR/SID. Arrival tracks for Runways 08R and 26L were modelled using evenly spaced 'spurs' about the extended runway centrelines. The majority of arriving aircraft joined the centrelines at distances between 14 and 29 km from threshold for Runway 26L, and between 15 and 25 km from threshold for Runway 08R.

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 year 2015 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 Daytime flight profiles were generated as in previous years. Following a check on night-time profile data, it was concluded that the profiles generated from the daytime data were appropriate for use with the night contours.

2.4.3 The application of reverse thrust following touchdown was modelled for all ANCON types where applicable. Reverse thrust was included in both the day and night contours.

2.5 Noise emissions

2.5.1 At Gatwick, the NTK system captures data from both fixed and mobile noise monitors around the airport. Noise event data for individual aircraft operations were matched to operational data provided by the airport. The Gatwick NTK system employs 5 fixed monitors positioned approximately 6.5 km from start-of-roll, together with a number of mobile monitors that can be deployed anywhere within the NTK radar coverage area.[6]

2.5.2 The noise data collected were screened by ERCD with reference to several criteria so that only reliable data were used in the analysis. First of all, noise data that lay outside a 'weather window' were discarded. This ensured that the data used were not affected by adverse meteorological conditions such as precipitation and strong winds. Secondly, the maximum noise level of the aircraft event had to exceed the noise monitor threshold by at least 10 dB to avoid underestimates of

[6] Further information on the noise monitors can be found in CAP 1149 (**Ref 6**).

the Sound Exposure Level (SEL). Thirdly, only measurements obtained from aircraft operations that passed through a 60-degree inverted cone, centred at the noise monitor, were retained in order to minimise the effects of lateral attenuation and lateral directivity.[7]

2.5.3 The ANCON model calculates aircraft noise using a noise database expressing SEL as a function of engine power setting and slant distance to the receiver – also known as the 'Noise-Power-Distance' (NPD) relationship. The ANCON noise database is continually reviewed and updated with adjustments made annually when measurements show this to be necessary.

2.5.4 The noise levels of several ANCON types were adjusted to reflect lower measured levels in 2014 and 2015 - in particular, the EA319V and EA320V on departure, and the B772R, EA319V, EA320V and EA321V on arrival.[8]

2.6 Traffic distributions

2.6.1 The Leq contours were based on the daily average movements that took place during the 16-hour day (0700-2300 local time) and 8-hour night (2300-0700 local time), over the 92-day summer period from 16 June to 15 September inclusive. The source of this information was 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 NATS[9] and close agreement was found.

Daytime traffic distribution by Noise Class

2.6.2 The average number of daily movements at Gatwick over the 2015 summer day period (742.5) was 4% higher than in the previous year (2014: 715.6).

2.6.3 **Table 1a** lists the average summer day movements[10] by 8 Noise Classes of aircraft, ranked in ascending order of noise emission, i.e. from least to most noisy, in 2014 and 2015. The 8 Noise Classes, which were previously designated Noise Classes 1-8, have now been renamed as *Noise Classes A-H* respectively, as summarised in the following table. This has been done to avoid possible confusion with the ICAO noise 'Chapters'.[11]

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[7] *Lateral attenuation* is the excess sound attenuation caused by the ground surface, which can be significant at low angles of elevation. *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.

[8] EA319V/EA320V/EA321V = Airbus A319/320/321 with IAE V2500 engines; B772R = Boeing 777-200 with Rolls-Royce engines.

[9] NATS was the provider of air traffic control services to Gatwick Airport in 2015. In March 2016, this responsibility was transferred to Air Navigation Solutions Ltd, a wholly owned subsidiary of the DFS Group.

[10] Includes departures and arrivals.

[11] Aircraft certification 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', 'Chapter 4' and 'Chapter 14' types. The Chapter 4 standard (applicable from 2006) is more stringent than the Chapter 3 standard (1977) and typically characterised by modern, quieter, high-bypass turbofan aircraft. The Chapter 14

Noise Class description	Previous Noise Class ID (up to 2014)	New Noise Class ID (2015 onwards)
Small propeller	1	A
Large propeller	2	B
Narrow-body (Chapter 3/4)	3	C
Wide-body twins (Chapter 3/4)	4	D
Wide-body 3/4-engine (Chapter 3/4)	5	E
Wide-body 3/4-engine (1st gen.)	6	F
Narrow-body twins (2nd gen.)	7	G
Narrow-body 3/4-engine (1st gen.)	8	H

2.6.4 The majority of movements (91%) were within Noise Class C, i.e. narrow-body Chapter 3 and Chapter 4 jet aircraft, the numbers of which were up by 4% in 2015.

2.6.5 Wide-body twin-engine aircraft (Noise Class D) represented 6% of total movements in 2015, and their movements fell by 3% compared to the previous year. Although numbers of wide-body 3 or 4-engine aircraft (Noise Class E) increased by 27% in 2015, they comprised just 2% of total movements. Around 1% of movements were by large propeller aircraft (Noise Class B). The numbers of aircraft within Noise Class A (small props) were insignificant, and there were no movements in Noise Classes F, G and H, which represent the oldest and noisiest aircraft types that no longer operate at Gatwick.

2.6.6 An estimated[12] 99% of the aircraft in the 2015 summer day period were compliant with the ICAO Chapter 4 noise standard.

2.6.7 **Figure 5** illustrates the changing distribution of traffic among the 8 Noise Classes over the period from 1988 to 2015 inclusive. The shift over the years to increasingly higher proportions of narrow-body jet aircraft (i.e. Noise Class C) can be clearly seen.

standard will be applicable to new large aircraft types presented for certification from 2017 and it represents a further level of stringency compared to the Chapter 4 standard.

[12] The percentage figure is an estimate because in some cases, detailed aircraft information (e.g. engine modifications) was not readily available, so some assumptions had to be made.

Night-time traffic distribution by Noise Class

2.6.8 The average number of movements over the 2015 summer night period was 125.2, a 2% increase from the previous year (2014: 123.1). Arrivals comprised 64% of total 2015 night movements.

2.6.9 **Table 1b** lists the average summer night movements by 8 Noise Classes of aircraft, ranked in ascending order of noise emission, i.e. from least to most noisy, in 2014 and 2015. Similar to daytime, narrow-body jet aircraft (Noise Class C) made up the vast majority of movements (93%) at night. The second largest grouping was wide-body twin-engine aircraft (Noise Class D), with 7% of movements. There were insignificant numbers in Noise Classes A, B and E, and no movements by aircraft in Noise Classes F, G and H.

2.6.10 An estimated 98% of aircraft in the 2015 summer night period were compliant with the Chapter 4 noise standard.

Daytime traffic distribution by ANCON aircraft type

2.6.11 A more detailed breakdown of the year 2015 average summer day movements, indicating the ANCON aircraft types that fall into each Noise Class, is provided in **Table 2a**. The largest increase in movements was for the ANCON type EA320C (Noise Class C), which was up by 31 movements per day (note: ANCON type descriptions can be found in **Table 2a**). There were also notable movement increases within Noise Class C for the EA319V (up by 25 per day) and the EA320V (up by 23). These rises were offset by decreases in Noise Class C for the B733, which was down substantially by 44 daily movements, the EA319C (down by 19 per day) and the B757E (down by 17).

2.6.12 Within Noise Class D, 27% of movements were by the more modern B788 ANCON aircraft type.

2.6.13 Within Noise Class E, the EA38GP was responsible for 33% of movements, whilst B744G movements accounted for 63%.

2.6.14 **Figure 6a** illustrates the numbers of movements by ANCON aircraft type for the 2015 average summer day. It can be seen that in 2015, the EA319C was by far the most frequent ANCON type at Gatwick with 212 daily movements (29% of the total), the majority of which were operated by Easyjet. This was followed by the EA320C with 155 movements (21% of the total), the B738 with 112 movements (15% of the total) and then the EA319V with 66 movements (9% of the total).

2.6.15 The noise dominant ANCON types (for both departures and arrivals) at Gatwick in 2015 over the daytime period were the EA320C, EA319C and B738. They were responsible for the highest contributions of ‘noise energy’, which is a function of both aircraft noise level and movement numbers.

Night-time traffic distribution by ANCON aircraft type

2.6.16 A more detailed breakdown of the year 2015 average summer night movements, indicating the ANCON aircraft types that fall into each Noise Class, is provided in **Table 2b**. The three largest movement increases were within Noise Class C, for the EA321C and EA320C (both up by 5 per night), and the EA320V (up by 4 per night). The largest decreases were also found in Noise Class C, with the B757E and B733 both down by 7 movements per night.

2.6.17 The more modern B788 ANCON aircraft type made up 30% of movements in Noise Class D.

2.6.18 **Figure 6b** illustrates the numbers of movements by ANCON aircraft type for the 2015 average summer night. It can be seen that movements were dominated by three aircraft types: the EA320C with 35 movements per night (representing 28% of total night movements), the EA319C with 29 movements per night (23% of the total) and the B738 with 17 movements per night (14% of the total).

2.6.19 The noise dominant ANCON types (for both departures and arrivals) at Gatwick over the 2015 night-time period were the EA320C, EA319C and B738. They were responsible for the highest contributions of 'noise energy', which is a function of both aircraft noise level and movement numbers.

Daytime traffic distribution by NPR/SID route

2.6.20 **Figure 7a** shows the percentage distribution of aircraft departures by NPR/SID route for the 2015 summer day period, with distribution figures from 2014 for comparison. The 'wraparound' route LAM/BIG/CLN/DVR from Runway 26L had the highest loading of departure traffic in 2015 (29%). This was followed by the HAR/BOG route from Runway 26L with 24% of total departure movements, and then the Runway 26L KEN/SAM route with 21%. The percentage traffic loadings on these three sets of departure routes increased by between 3-4%. There were reductions of up to 3% in the percentage traffic loadings on each of the Runway 08R routes. The changes in percentage loading on the routes were largely due to the year-on-year variation in the runway modal split, as described in section 2.7.

Night-time traffic distribution by NPR/SID route

2.6.21 **Figure 7b** shows the percentage distribution of aircraft departures by NPR/SID route for the 2015 summer night period, with distribution figures from 2014 for comparison. Similar to daytime, the 'wraparound' route LAM/BIG/CLN/DVR from Runway 26L had the highest loading of departure traffic (32%), followed by the Runway 26L HAR/BOG route with 26% of total departures. The highest percentage increase of 9% was found on the Runway 26L LAM/BIG/CLN/DVR route. Most of the easterly routes saw percentage reductions, with the largest reduction of 6% found on Runway 08R SFD. The changes in percentage loading on the routes were largely due to the year-on-year variation in the runway modal split, as described in section 2.7.

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 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 westerly (Runway 26L) and easterly (Runway 08R) operations is referred to as the *runway modal split*.

2.7.2 Two sets of contours have been produced for the year 2015 summer day:

(i) Contours using the 'actual' modal split over the Leq day period; and

(ii) Contours assuming the 'standard' modal split over the Leq day period, i.e. the long-term modal split calculated from the 20-year rolling average. For 2015, this is the 20-year period from 1996 to 2015. Use of the standard modal split enables year-on-year comparisons without the runway usage significantly affecting the contour shape.

2.7.3 The actual and standard daytime modal splits for 2015 and the previous year are summarised in the following table:

Gatwick summer day runway modal splits for 2015 and 2014

Modal split scenario	**% west (Runway 26L)**	**% east (Runway 08R)**
Actual 2015	74%	26%
Actual 2014	64%	36%
Standard 2015	74%	26%
Standard 2014	73%	27%

2.7.4 After a relatively high number of easterly days in 2014, the daytime actual modal split reverted to a more typical figure in 2015 (74% west / 26% east), with a 10% higher proportion of westerly operations compared to 2014. The 2015 standard modal split of 74% west / 26% east was the same as the 2015 actual modal split. Historical runway modal splits at Gatwick for the past 20 years are summarised in **Figure 8**.

2.7.5 The night-time actual runway modal split for the 2015 summer period was also 74% west / 26% east, which was similar to the year 2013 night-time split, but with 14% more westerly operations than in 2014 (60% west / 40% east). The night-time modal splits for the past 3 years are summarised in the following table:

Gatwick summer night runway modal splits

Year	% west (Runway 26L)	% east (Runway 08R)
2015	74%	26%
2014	60%	40%
2013	73%	27%

2.8 Topography

2.8.1 The topography around Gatwick Airport was modelled by accounting for terrain height, and is of particular relevance on the western side of the airport around the high ground in the vicinity of Russ Hill (near Charlwood). 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[13] 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 Gatwick 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 and households enclosed within the noise contours. The population data used in this report are a 2015 update of the 2011 Census supplied by CACI Limited.[14]

2.9.2 The CACI population database contains data referenced at postcode level. Population and household numbers for each postcode are assigned to a single coordinate located at the postcode's centroid. The postcode data points and associated population counts for the area around Gatwick Airport are illustrated in **Figure 10**.

2.9.3 Within the extent of the 2015 day actual 57 dBA Leq contour, the population count using the 2015 population database was 1% lower than with the 2014 database, so the effect of the 2015 database update was a small decrease in population for the Gatwick area.

[13] Meridian™ 2

[14] www.caci.co.uk

2.9.4 Estimates have also been made of the numbers of noise sensitive buildings situated within the daytime contours, using the *InterestMap*™[15] 'Points of Interest' (2015) database. For the purpose of this study, the noise sensitive buildings that have been considered are schools, hospitals and places of worship.

[15] InterestMap™ is distributed by Landmark Information Group Ltd and derived from Ordnance Survey 'Points of Interest' data.

3 Noise contour results

3.1 Day actual modal split contours

3.1.1 The Gatwick 2015 day Leq noise contours generated with the actual 2015 summer day period runway modal split (74% west / 26% east) are shown in **Figure 11a**. The contours are plotted from 57 to 72 dBA at 3 dB intervals.

3.1.2 Cumulative estimates of the areas, populations and households within the 2015 day actual modal split contours are provided in the table below:

Gatwick 2015 day actual contours – area, population and household estimates

Leq (dBA)	Area (km^2)	Population	Households
> 57	42.8	3,650	1,450
> 60	24.2	1,550	550
> 63	13.0	550	150
> 66	6.7	350	100
> 69	3.5	150	0
> 72	2.0	0	0

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

3.1.3 The 2015 day actual 57 dBA Leq contour enclosed an area of 42.8 km^2 and a population of 3,650.

3.1.4 Estimates of the cumulative numbers of noise sensitive buildings within the 2015 day actual contours are provided in the table below:

Gatwick 2015 day actual contours – noise sensitive building estimates

Leq (dBA)	Schools	Hospitals	Places of worship
> 57	3	0	3
> 60	2	0	2
> 63	1	0	2
> 66	1	0	1
> 69	0	0	0
> 72	0	0	0

3.2 Night actual modal split contours

3.2.1 The Gatwick 2015 night Leq noise contours generated with the actual 2015 summer night period runway modal split (74% west / 26% east) are shown in **Figure 11b**. The contours are plotted from 48 to 66 dBA at 3 dB intervals (note: the 69 and 72 dBA contours have been omitted for clarity).

3.2.2 Cumulative estimates of the areas, populations and households within the 2015 night actual modal split contours are provided in the following table:

Gatwick 2015 night actual contours – area, population and household estimates

Leq (dBA)	Area (km^2)	Population	Households
> 48	104.7	14,400	5,750
> 51	54.6	6,300	2,450
> 54	28.1	1,900	750
> 57	15.1	750	250
> 60	7.5	400	100
> 63	3.9	200	50
> 66	2.1	0	0
> 69	1.2	0	0
> 72	0.7	0	0

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

3.2.3 The 2015 night actual 48 dBA Leq contour enclosed an area of 104.7 km^2 and a population of 14,400.

3.3 Day standard modal split contours

3.3.1 The Gatwick 2015 day Leq noise contours generated with the standard 2015 summer day period runway modal split (74% west / 26% east) are shown in **Figure 12**. The contours are plotted from 57 to 72 dBA at 3 dB intervals. The standard modal split contours were the same as the actual modal split contours in 2015 because of the identical modal splits.

3.3.2 Cumulative estimates of the areas, populations and households within the 2015 day standard modal split contours are provided in the following table:

Gatwick 2015 day standard contours - area, population and household estimates

Leq (dBA)	Area (km^2)	Population	Households
> 57	42.8	3,650	1,450
> 60	24.2	1,550	550
> 63	13.0	550	150
> 66	6.7	350	100
> 69	3.5	150	0
> 72	2.0	0	0

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

3.3.3 The 2015 day standard 57 dBA Leq contour enclosed an area of 42.8 km^2 and a population of 3,650.

3.3.4 Estimates of the cumulative numbers of noise sensitive buildings within the 2015 day standard contours are provided in the table below:

Gatwick 2015 day standard contours - noise sensitive building estimates

Leq (dBA)	Schools	Hospitals	Places of worship
> 57	3	0	3
> 60	2	0	2
> 63	1	0	2
> 66	1	0	1
> 69	0	0	0
> 72	0	0	0

4 Analysis of results

4.1 Day actual modal split contours – comparison with 2014 contours

4.1.1 The Gatwick 2015 day actual modal split Leq contours are compared against the 2014 day actual Leq contours in **Figure 13a**. The table below summarises the areas, populations and percentage changes from 2014 to 2015:

Gatwick day actual contours - area and population estimates for 2014 and 2015

Leq (dBA)	2014 Area (km^2)	2015 Area (km^2)	Area change (%)	2014 Pop.	2015 Pop.	Pop. change (%)
> 57	42.2	42.8	+1%	3,300	3,650	+11%
> 60	23.9	24.2	+1%	1,500	1,550	+3%
> 63	13.0	13.0	0%	550	550	0%
> 66	7.0	6.7	-4%	400	350	-13%
> 69	3.7	3.5	-5%	150	150	0%
> 72	2.0	2.0	0%	0	0	(-)

Notes: The 2014 and 2015 day actual runway modal splits were 64% west / 36% east and 74% west / 26% east respectively.

4.1.2 The effects of the 10% shift in runway modal split in favour of westerly operations can be seen in the arrival contour tips to the east of the airport, which have extended noticeably. There was also an expansion of the contours at the western tip, caused by departures reverting to the HAR/BOG SIDs from the ADNID trial route that was used in 2014. This more than offset a reduction in the percentage of easterly arrivals.

4.1.3 The 57 dBA contour area increased by 1% in 2015. This was caused by a 4% overall increase in movements, but offset to a large extent by adjustments to the noise levels of some of the ANCON aircraft types in the light of 2014 and 2015 noise monitoring data. A 1% area increase was also seen at the 60 dBA contour level, with reductions at some of the higher levels.

4.1.4 The population count within the 57 dBA contour rose by 11% - this was a result of the westerly arrival contour lobe extending over parts of Lingfield.

4.1.5 Percentage changes in contour area are not necessarily accompanied by similar changes in enclosed population because of the uneven distribution of populations around the airport.

4.2 Night actual modal split contours – comparison with 2014 contours

4.2.1 The Gatwick 2015 night actual modal split Leq contours are compared against the 2014 night actual Leq contours in **Figure 13b** (note: the 69 and 72 dBA contours have been omitted from the diagram for clarity). The table below summarises the areas, populations and percentage changes from 2014 to 2015:

Gatwick night actual contours - area and population estimates for 2014 and 2015

Leq (dBA)	2014 Area (km^2)	2015 Area (km^2)	Area change (%)	2014 Pop.	2015 Pop.	Pop. change (%)
> 48	103.5	104.7	+1%	12,850	14,400	+12%
> 51	52.6	54.6	+4%	6,300	6,300	0%
> 54	28.2	28.1	0%	1,800	1,900	+6%
> 57	15.2	15.1	-1%	900	750	-17%
> 60	7.9	7.5	-5%	400	400	0%
> 63	4.2	3.9	-7%	200	200	0%
> 66	2.3	2.1	-9%	0	0	(-)
> 69	1.4	1.2	-14%	0	0	(-)
> 72	0.9	0.7	-22%	0	0	(-)

Note: The 2014 and 2015 night actual runway modal splits were 60% west / 40% east and 74% west / 26% east respectively.

4.2.2 There was a 14% shift in the 2015 runway modal split in favour of westerly operations from the previous year. The effects of this were evident in the extension of the westerly departure lobe over Capel and also at the westerly arrival contour tips in the Edenbridge and Hever area. The contour tips to the west of the airport reduced in size because of the markedly lower percentage of easterly arrivals. Arrival noise dominated the night contours because there were nearly twice as many arrival movements as departures during the night period.

4.2.3 The 48 dBA contour area increased by 1% following the 2% rise in night traffic in 2015. The ANCON aircraft types that were adjusted for noise in 2015 were less noise significant over the night period compared to the daytime. An increase in area was also seen at the 51 dBA contour level, but at the higher levels the areas reduced.

4.2.4 The population count within the 48 dBA contour increased by 12% due to the extension of the departure contour lobe over Capel and the expansion of the westerly arrival contour in the region around Edenbridge and Hever.

4.3 Day standard modal split contours – comparison with 2014 contours

4.3.1 The Gatwick 2015 day standard modal split Leq contours are compared against the 2014 day standard Leq contours in **Figure 14**. The following table summarises the areas, populations and percentage changes from 2014 to 2015:

Gatwick day standard contours - area and population estimates for 2014 and 2015

Leq (dBA)	2014 Area (km^2)	2015 Area (km^2)	Area change (%)	2014 Pop.	2015 Pop.	Pop. change (%)
> 57	42.3	42.8	+1%	3,700	3,650	-1%
> 60	23.9	24.2	+1%	1,550	1,550	0%
> 63	12.9	13.0	+1%	600	550	-8%
> 66	7.0	6.7	-4%	400	350	-13%
> 69	3.7	3.5	-5%	150	150	0%
> 72	2.1	2.0	-5%	0	0	(-)

Note: The 2014 and 2015 day standard runway modal splits were 73% west / 27% east and 74% west / 26% east respectively.

4.3.2 The standard contours normally provide a clearer indication than the actual contours of 'fleet noise level' changes from year to year, because they minimise the effects of any differences between the ratios of westerly to easterly operations.

4.3.3 There were minimal changes to the eastern contour tips, as the increase in movements was offset by noise adjustments to some of the ANCON aircraft types, which made them quieter on arrival. At the western end, the contour expansion can be attributed to the shift in westerly departure movements from the ADNID trial SID route, which was used in 2014, back onto the original flight paths (i.e. HAR/BOG).

4.3.4 The standard modal split 57 dBA contour area increased by 1% in 2015 for the same reasons as the actual modal split contours. There was a 1% decrease in population compared to 2014.

4.4 Day noise contour historical trend

4.4.1 **Figure 15** shows how the 57 dBA Leq day actual modal split 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.

Movement trend

4.4.2 Aircraft movements reached a low in 1991 (the year of the First Gulf War) and did not return to 1990 levels until 1995. From 1995 to 2000 they increased steadily. From 2000 to 2002 movements decreased, possibly as a consequence of the terrorist attacks on 11 September 2001. There was little change in the total annual number of movements from 2002 to 2003, but annual movements rose steadily from 2004 to 2007. However, the annual movement figure for 2008 fell by 1% from 2007 - this may be attributed to the fluctuating oil price and economic downturn. The annual movements fell even further in 2009, by 4%, as the global recession continued to impact upon the aviation industry.

4.4.3 Movements dropped for the third year in a row in 2010, by a further 5%. This was due in part to the volcanic ash crisis in April and adverse winter weather conditions. However, there was a recovery in 2011 from the adverse events of the previous year as traffic levels rose by 4%. In 2012 traffic levels fell by about 2% following a significant drop in charter flights at Gatwick. However, movement numbers increased from 2013 through to 2015 as demand returned.

Area and population trend

4.4.4 From 1988 to 1993, the area within the 57 dBA Leq contour diminished markedly and then increased slightly until 1996. From 1996 onwards the area decreased each year but levelled off between 1999 and 2000. In 2001, the area fell by 22% relative to the previous year, and in 2002, the contour area decreased by 19% relative to 2001. From 2002 to 2008 the contour area fluctuated within a narrow range from 45 to 49 km^2. However, the area fell below this range to 41 km^2 in 2009, and dropped further in 2010 to 39.6 km^2, the smallest ever area calculated for Gatwick, as the global recession impacted upon the aviation industry.

4.4.5 The contour area increased slightly in 2011 to 40.4 km^2 as movements started to recover. In 2012 the area was again slightly higher, this time mainly due to some changes in the fleet mix. The 2013 contour area reduced slightly from 2012 despite a rise in movements, largely because of fleet mix changes in favour of quieter types. However, in 2014 the contour area increased by 3% as total movements rose again and some large twin-turboprop aircraft were replaced by narrow-body jets. There was a 1% area increase in 2015 as higher numbers of movements were largely offset by noise adjustments to some of the ANCON aircraft types in the light of recent monitoring data.

4.4.6 The population numbers within the contours have generally moved in line with the areas, dropping to the lowest ever level in 2010, but increasing again in 2011. The marked rise in population for 2012 was largely the result of the contour extending over a densely populated area (Lingfield). In 2013, the population dropped significantly (-11%) as the higher proportion of easterly movements caused the contour to move away from Lingfield. The population count increased in 2014 following the inclusion of Gatwick immigration removal centre residents in the population database for the first time. A significant rise in population (+11%) also occurred in 2015 as the contour extended over Lingfield, following a shift in the runway modal split back to a more typical figure.

5 Conclusions

5.1 Year 2015 average summer 16-hour day and 8-hour night Leq noise exposure contours have been generated for Gatwick Airport using the ANCON noise model.

5.2 The results show that the 2015 day actual modal split (74% west / 26% east) 57 dBA Leq contour area increased by 1% to 42.8 km^2 (2014: 42.2 km^2). There was a 4% rise in movements in 2015, but this was largely offset by noise reductions applied to some of the ANCON aircraft types to take into account noise monitoring data from 2014 and 2015. The population count within the 57 dBA actual contour increased by 11% in 2015 to 3,650 (2014: 3,300). This was mainly due to the westerly arrival contour lobe extending over parts of Lingfield following a significant shift in the runway modal split in favour of westerly operations.

5.3 The 2015 day standard modal split (74% west / 26% east) 57 dBA Leq contour area also increased by 1%, to 42.8 km^2 (2014: 42.3 km^2). The standard and actual daytime modal splits were the same in 2015. The standard contour area increased for the same reasons as the actual modal split contours. The population enclosed by the 2015 standard 57 dBA Leq contour was 3,650, 1% lower than in the previous year (2014: 3,700).

5.4 Night-time Leq contours have also been produced. The 2015 night actual modal split (74% west / 26% east) 48 dBA Leq contour enclosed an area of 104.7 km^2, an increase of 1% from the year before (2014: 103.5 km^2). Night traffic increased by 2% in 2015. The population count within the 48 dBA contour for 2015 was 14,400, a rise of 12% (2014: 12,850). This was caused by the 48 dBA contour expanding over Capel and also in the area around Edenbridge and Hever, following a large shift in the runway modal split to a higher percentage of westerly operations.

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Table 1a Gatwick 2014 and 2015 average summer day movements by Noise Class

Noise Class	Description	2014	2015	Percentage of total 2015 movements	Change
PROPELLER AIRCRAFT					
A	Small propeller aircraft	0.2	0.1	0%	-0.1 (*)
B	Large propeller aircraft	7.4	9.1	1%	+1.7 (+23%)
CHAPTER 3/4 JETS					
C	Narrow-body aircraft	652.9	676.8	91%	+23.9 (+4%)
D	Wide-body twin-engine aircraft	44.8	43.3	6%	-1.5 (-3%)
E	Wide-body 3 or 4-engine aircraft	10.4	13.2	2%	+2.8 (+27%)
LARGE CHAPTER 2/3 JETS					
F	1st generation wide-body 3 or 4-engine aircraft	0.0	0.0	0%	0.0 (-)
2nd GENERATION TWIN JETS					
G	Narrow-body twin-engine aircraft *(including Ch.2 and hush-kitted versions)*	0.0	0.0	0%	0.0 (-)
1st GENERATION JETS					
H	Narrow-body 3 or 4-engine aircraft *(including hush-kitted versions)*	0.0	0.0	0%	0.0 (-)
	TOTAL	715.6	**742.5**	100%	**+26.9 (+4%)**

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

Notes:

- Totals may not sum exactly due to rounding.
- An estimated 99% of aircraft in the 2015 daytime period met the ICAO Chapter 4 noise standard.

Table 1b Gatwick 2014 and 2015 average summer night movements by Noise Class

Noise Class	Description	2014	2015	Percentage of total 2015 movements	Change
PROPELLER AIRCRAFT					
A	Small propeller aircraft	0.1	0.1	0%	0.0 (*)
B	Large propeller aircraft	0.0	< 0.1	0%	0.0 (*)
CHAPTER 3/4 JETS					
C	Narrow-body aircraft	114.5	116.2	93%	+1.7 (+1%)
D	Wide-body twin-engine aircraft	8.1	8.6	7%	+0.5 (+6%)
E	Wide-body 3 or 4-engine aircraft	0.3	0.3	0%	0.0 (*)
LARGE CHAPTER 2/3 JETS					
F	1st generation wide-body 3 or 4-engine aircraft	0.0	0.0	0%	0.0 (-)
2nd GENERATION TWIN JETS					
G	Narrow-body twin-engine aircraft *(including Ch.2 and hush-kitted versions)*	0.0	0.0	0%	0.0 (-)
1st GENERATION JETS					
H	Narrow-body 3 or 4-engine aircraft *(including hush-kitted versions)*	0.0	0.0	0%	0.0 (-)
	TOTAL	123.1	**125.2**	100%	**+2.1 (+2%)**

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

Notes:

- Totals may not sum exactly due to rounding.
- An estimated 98% aircraft in the 2015 night-time period met the ICAO Chapter 4 noise standard.

Table 2a Gatwick 2014 and 2015 average summer day movements by ANCON aircraft type

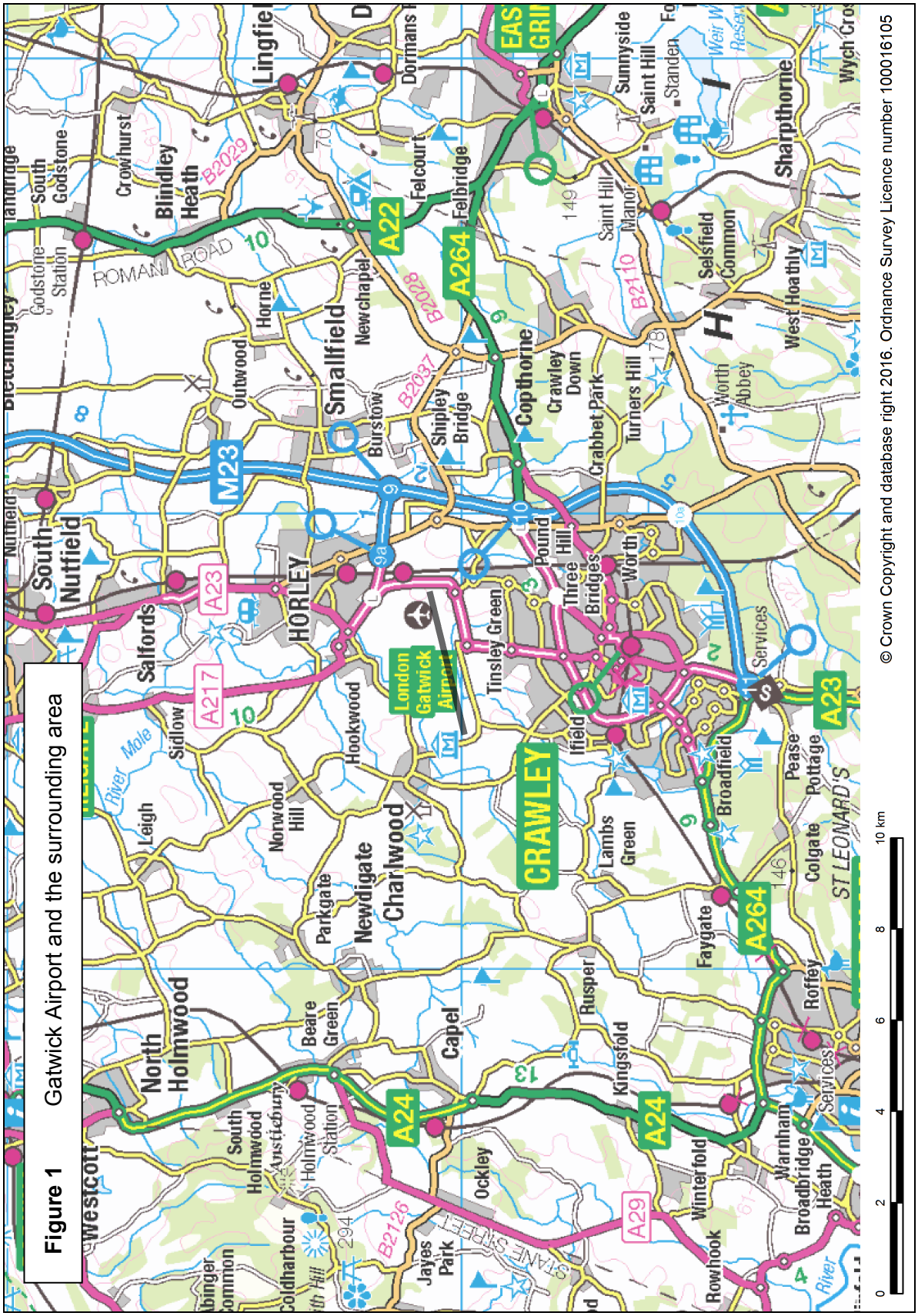
Aircraft type	Noise Class	ANCON type	2014	2015	Change
Single piston propeller	A	SP	< 0.1	< 0.1	0.0
Small twin-piston propeller	A	STP	< 0.1	0.1	0.0
Small twin-turboprop	A	STT	0.1	< 0.1	-0.1
Large twin-turboprop	B	LTT	7.4	9.1	+1.7
Boeing 737-300/400/500	C	B733	57.7	14.0	-43.7
Boeing 737-600/700	C	B736	1.3	1.8	+0.5
Boeing 737-800/900	C	B738	101.0	111.7	+10.7
Boeing 757-200 (RB211-535E4/E4B engines)	C	B757E	29.3	12.6	-16.7
Boeing 757-200 (PW2037/2040 engines)	C	B757P	< 0.1	0.1	0.0
Boeing 757-300	C	B753	5.7	5.3	-0.4
BAe 146/Avro RJ	C	BA46	0.1	0.1	0.0
Bombardier CRJ100/200	C	CRJ	0.0	0.1	+0.1
Bombardier CRJ900	C	CRJ900	0.3	0.1	-0.2
Airbus A318	C	EA318	< 0.1	0.1	0.0
Airbus A319 (CFM56 engines)	C	EA319C	231.3	211.9	-19.4
Airbus A319 (IAE V2500 engines)	C	EA319V	41.4	66.2	+24.8
Airbus A320 (CFM56 engines)	C	EA320C	123.3	154.5	+31.2
Airbus A320 (IAE V2500 engines)	C	EA320V	19.6	42.3	+22.7
Airbus A321 (CFM56 engines)	C	EA321C	0.1	10.7	+10.6
Airbus A321 (IAE V2500 engines)	C	EA321V	28.7	31.9	+3.2
Embraer ERJ 135/145	C	ERJ	0.1	0.2	+0.1
Embraer E-170	C	ERJ170	0.5	0.5	0.0
Embraer E-190	C	ERJ190	9.4	9.7	+0.3
Executive Business Jet (Chapter 3)	C	EXE3	2.9	2.0	-0.9
Fokker 100	C	FK10	< 0.1	0.4	+0.4
McDonnell Douglas MD-80 series	C	MD80	0.2	0.8	+0.6
Boeing 767-200	D	B762	0.0	< 0.1	0.0
Boeing 767-300 (GE CF6-80 engines)	D	B763G	2.5	2.7	+0.2
Boeing 767-300 (PW PW4000 engines)	D	B763P	0.8	0.9	+0.1
Boeing 777-200 (GE GE90 engines)	D	B772G	13.9	12.2	-1.7
Boeing 777-200 (PW PW4000 engines)	D	B772P	0.1	0.0	-0.1
Boeing 777-200 (RR Trent 800 engines)	D	B772R	2.8	3.2	+0.4
Boeing 777-200LR/300ER (GE GE90 engines)	D	B773G	3.8	2.5	-1.3
Boeing 787-8 Dreamliner	D	B788	7.3	11.6	+4.3
Airbus A300	D	EA30	< 0.1	0.0	0.0
Airbus A310	D	EA31	1.3	0.9	-0.4
Airbus A330	D	EA33	12.2	9.3	-2.9
Boeing 747-400 (GE CF6-80F engines)	E	B744G	8.2	8.3	+0.1
Airbus A340-200/300	E	EA34	0.1	0.5	+0.4
Airbus A340-500/600	E	EA346	< 0.1	< 0.1	0.0
Airbus A380 (Engine Alliance GP7000 engines)	E	EA38GP	2.0	4.3	+2.3
		TOTAL	715.6	**742.5**	**+26.9 (+4%)**

Note: Totals may not sum exactly due to rounding.

Table 2b Gatwick 2014 and 2015 average summer night movements by ANCON aircraft type

Aircraft type	Noise Class	ANCON type	2014	2015	Change
Small twin-piston propeller	A	STP	< 0.1	0.1	+0.1
Small twin-turboprop	A	STT	0.1	< 0.1	-0.1
Large twin-turboprop	B	LTT	0.0	< 0.1	0.0
Boeing 737-300/400/500	C	B733	7.7	1.2	-6.5
Boeing 737-600/700	C	B736	< 0.1	0.0	0.0
Boeing 737-800/900	C	B738	18.2	17.4	-0.8
Boeing 757-200 (RB211-535C engines)	C	B757C	0.0	< 0.1	0.0
Boeing 757-200 (RB211-535E4/E4B engines)	C	B757E	11.2	4.2	-7.0
Boeing 757-300	C	B753	2.1	2.2	+0.1
BAe 146/Avro RJ	C	BA46	< 0.1	0.0	0.0
Airbus A319 (CFM56 engines)	C	EA319C	27.3	28.7	+1.4
Airbus A319 (IAE V2500 engines)	C	EA319V	3.2	6.0	+2.8
Airbus A320 (CFM56 engines)	C	EA320C	30.8	35.4	+4.6
Airbus A320 (IAE V2500 engines)	C	EA320V	3.3	7.0	+3.7
Airbus A321 (CFM56 engines)	C	EA321C	0.0	4.7	+4.7
Airbus A321 (IAE V2500 engines)	C	EA321V	9.9	8.7	-1.2
Embraer ERJ 135/145	C	ERJ	< 0.1	< 0.1	0.0
Embraer E-190	C	ERJ190	0.4	0.5	+0.1
Executive Business Jet (Chapter 3)	C	EXE3	0.3	0.2	-0.1
Boeing 767-300 (GE CF6-80 engines)	D	B763G	0.8	1.2	+0.4
Boeing 767-300 (PW PW4000 engines)	D	B763P	< 0.1	0.0	0.0
Boeing 777-200 (GE GE90 engines)	D	B772G	2.2	2.7	+0.5
Boeing 777-200 (RR Trent 800 engines)	D	B772R	0.3	0.0	-0.3
Boeing 777-200LR/300ER (GE GE90 engines)	D	B773G	0.3	0.2	-0.1
Boeing 787-8 Dreamliner	D	B788	0.7	2.6	+1.9
Airbus A330	D	EA33	3.7	1.8	-1.9
Boeing 747-400 (GE CF6-80F engines)	E	B744G	0.3	0.2	-0.1
Airbus A340-200/300	E	EA34	< 0.1	0.1	0.0
Airbus A340-500/600	E	EA346	< 0.1	0.0	0.0
Airbus A380 (Engine Alliance GP7000 engines)	E	EA38GP	< 0.1	< 0.1	0.0
		TOTAL	123.1	**125.2**	**+2.1 (+2%)**

Note: Totals may not sum exactly due to rounding.


Gatwick Airport and the surrounding area
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0
2
4
6
8
10 km
M23
A23
A217
A22
A264
A24
A29
B2029
B2028
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B2110
B2126
ROMAN ROAD
South Nutfield
Nutfield
Salfords
Sidlow
Leigh
HORLEY
Smallfield
Newchapel
Outwood
Horne
Burstow
Shipley Bridge
Copthorne
Crawley Down
Crabbet Park
Turners Hill
Selsfield Common
West Hoathly
Sharpthorne
Felbridge
Felcourt
Dormans
Lingfield
Blindley Heath
Crowhurst
South Godstone
Godstone Station
Bletchingley
Hookwood
London Gatwick Airport
Tinsley Green
Pound Hill
Three Bridges
Worth
Worth Abbey
Sunnyside
Saint Hill
Saint Hill Manor
Services
CRAWLEY
Ifield
Lambs Green
Broadfield
Pease Pottage
Colgate
Faygate
Rusper
Kingsfold
Roffey
Warnham
Broadbridge Heath
Winterfold
Rowhook
Ockley
Capel
Beare Green
Parkgate
Newdigate
Charlwood
Norwood Hill
North Holmwood
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Westcott
Coldharbour
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Figure 1

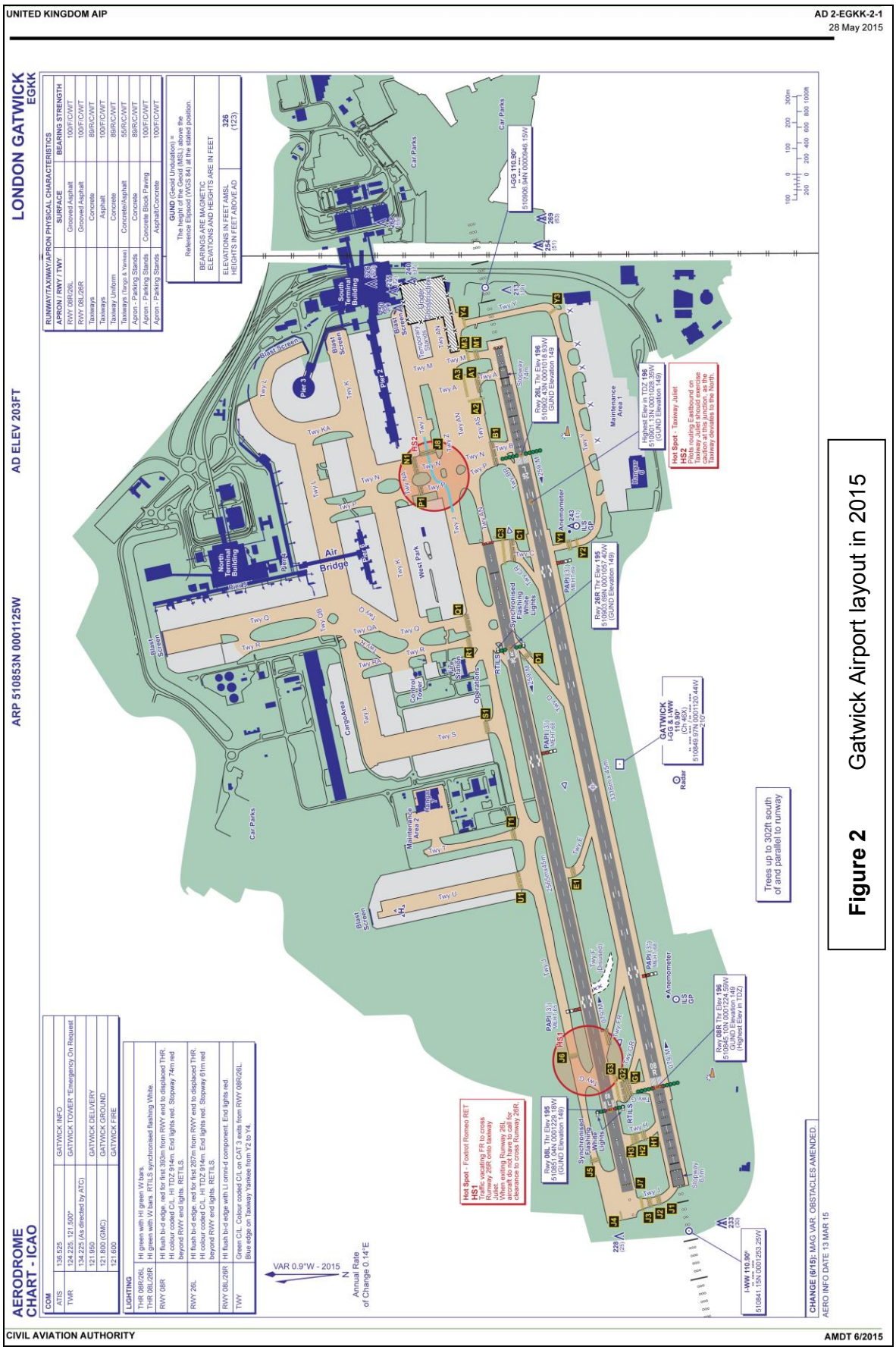


Figure 2 Gatwick Airport layout in 2015

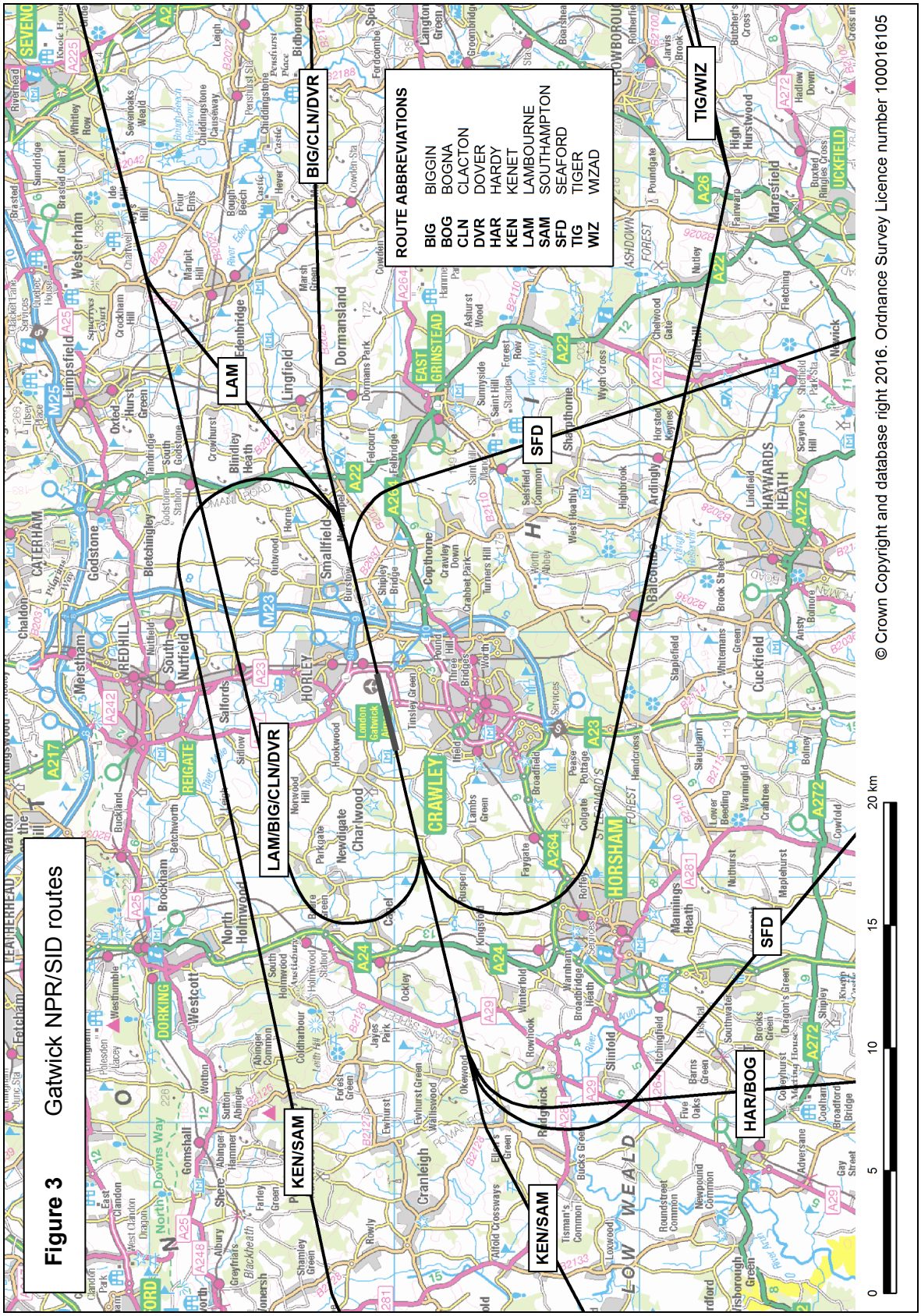


Figure 3 Gatwick NPR/SID routes

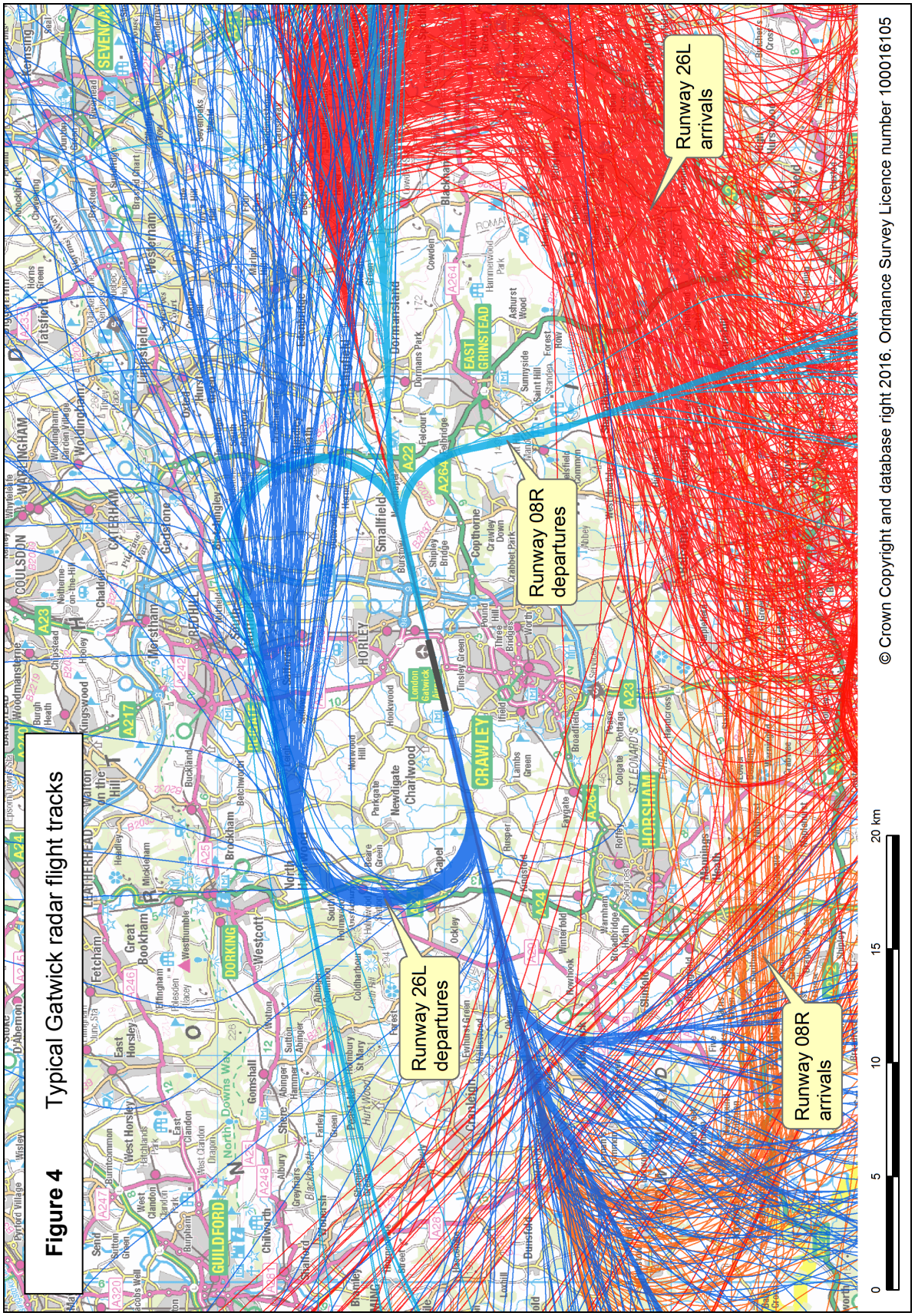
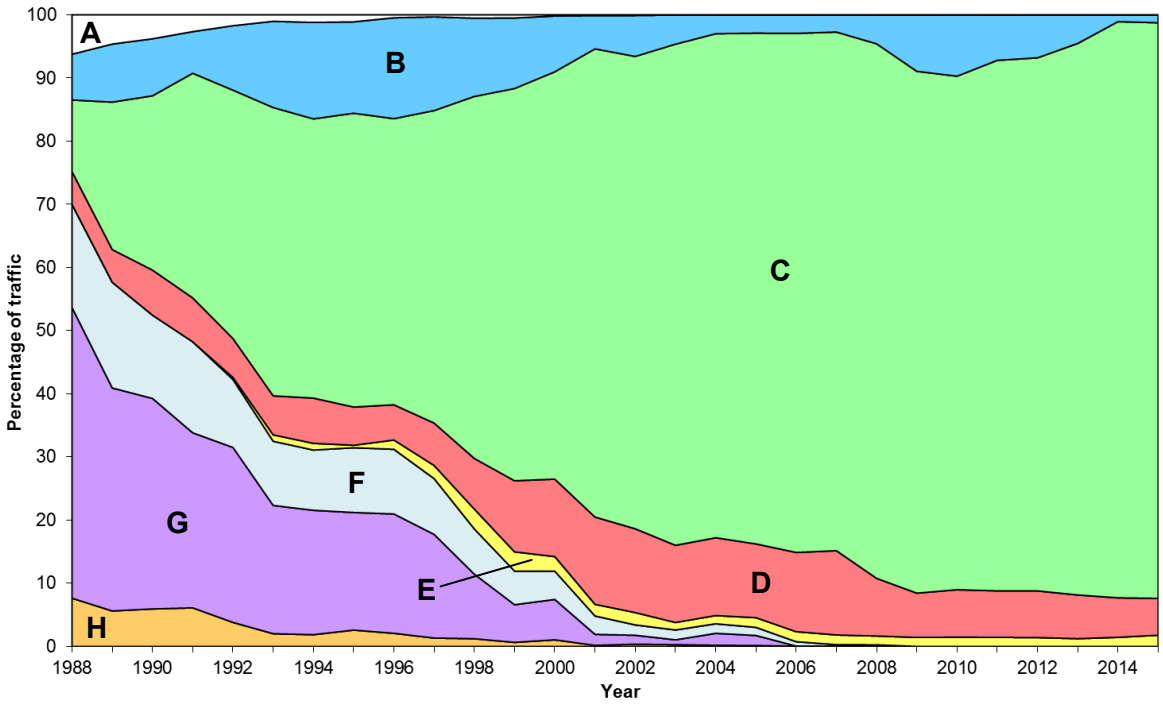


Figure 4 Typical Gatwick radar flight tracks

Figure 5 Gatwick Noise Class trend 1988-2015



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
A Small props, e.g. single/twin piston and turboprop light aircraft
B Large props, e.g. twin and 4-propeller transports, e.g. ATR-42, BAe ATP

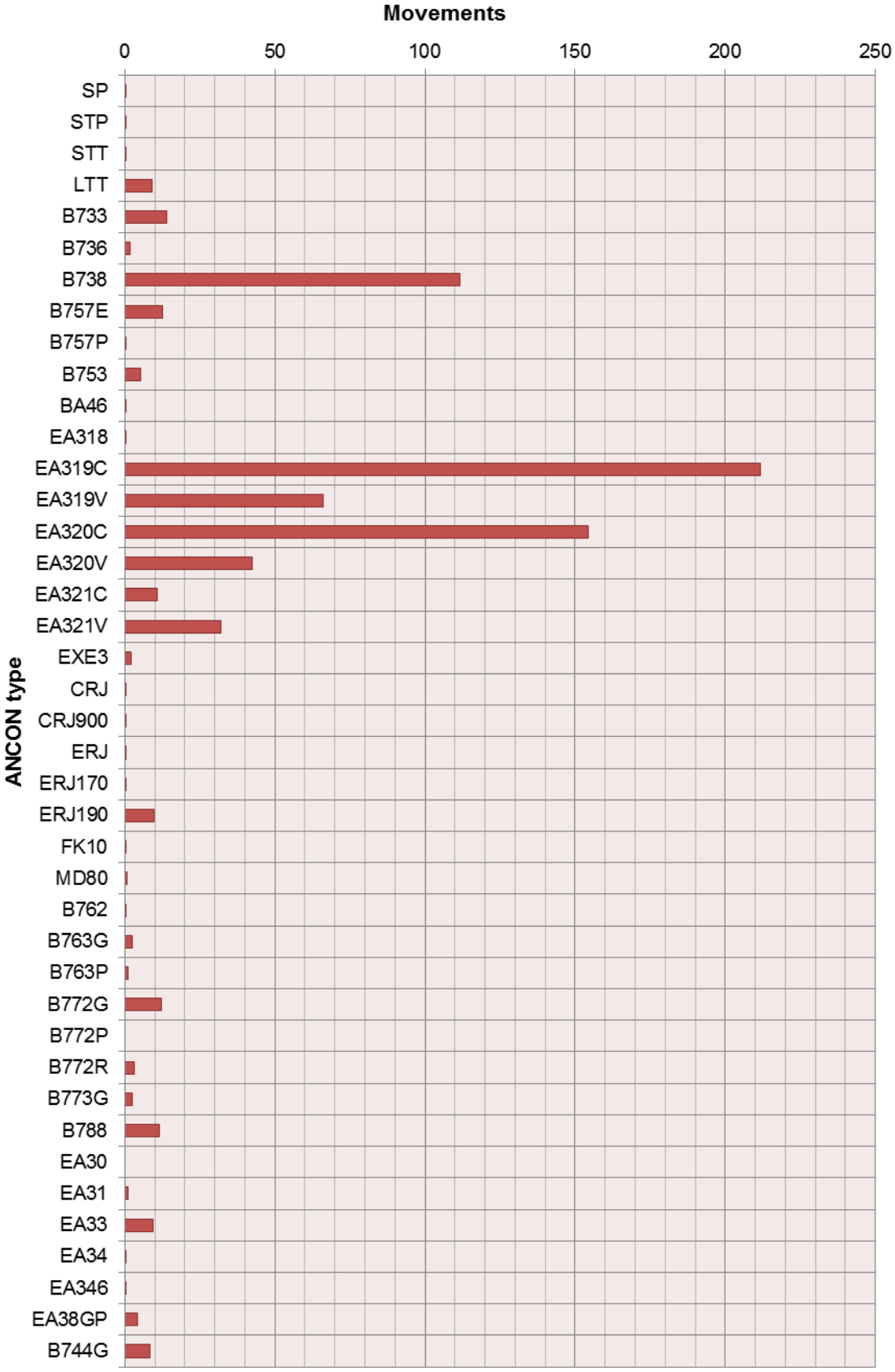
Chapter 3/4 jets
C Narrow-body aircraft, e.g. Airbus A319, Boeing 737-800
D Wide-body twins, e.g. Airbus A330, Boeing 777-200
E Wide-body 3 or 4-engine aircraft, e.g. Airbus A380, Boeing 747-400

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

2nd generation twin jets
G Narrow-body twins (including Ch.2 and hush-kitted versions), e.g. Boeing 737-200

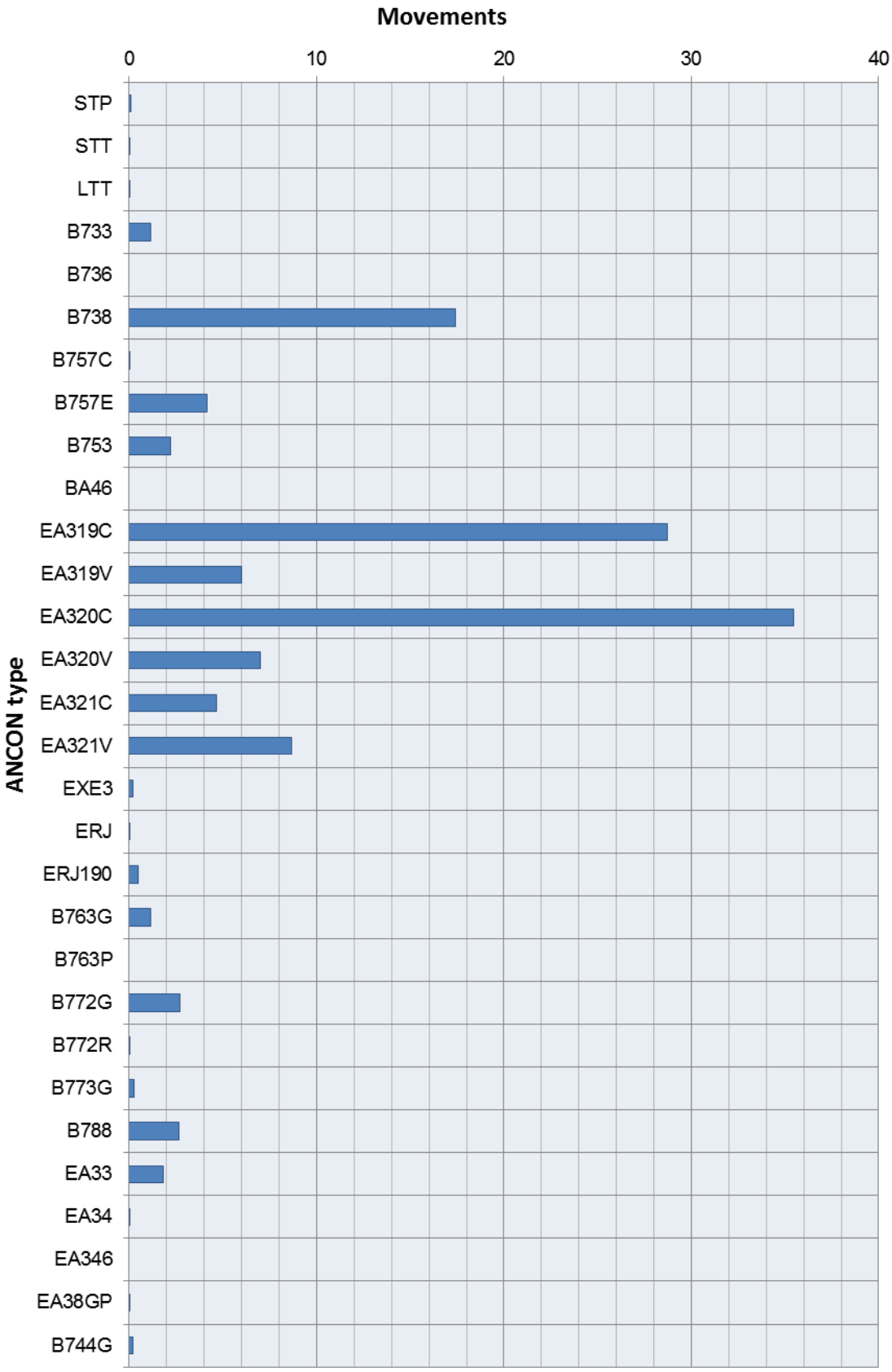
1st generation jets
H Narrow-body 3 or 4-engine aircraft (including hush-kitted versions), e.g. Boeing 707

Figure 6a Gatwick 2015 average summer day movements by ANCON aircraft type



Note: ANCON types are shown in the same order as **Table 2a**.

Figure 6b Gatwick 2015 average summer night movements by ANCON aircraft type



Note: ANCON types are shown in the same order as **Table 2b**.

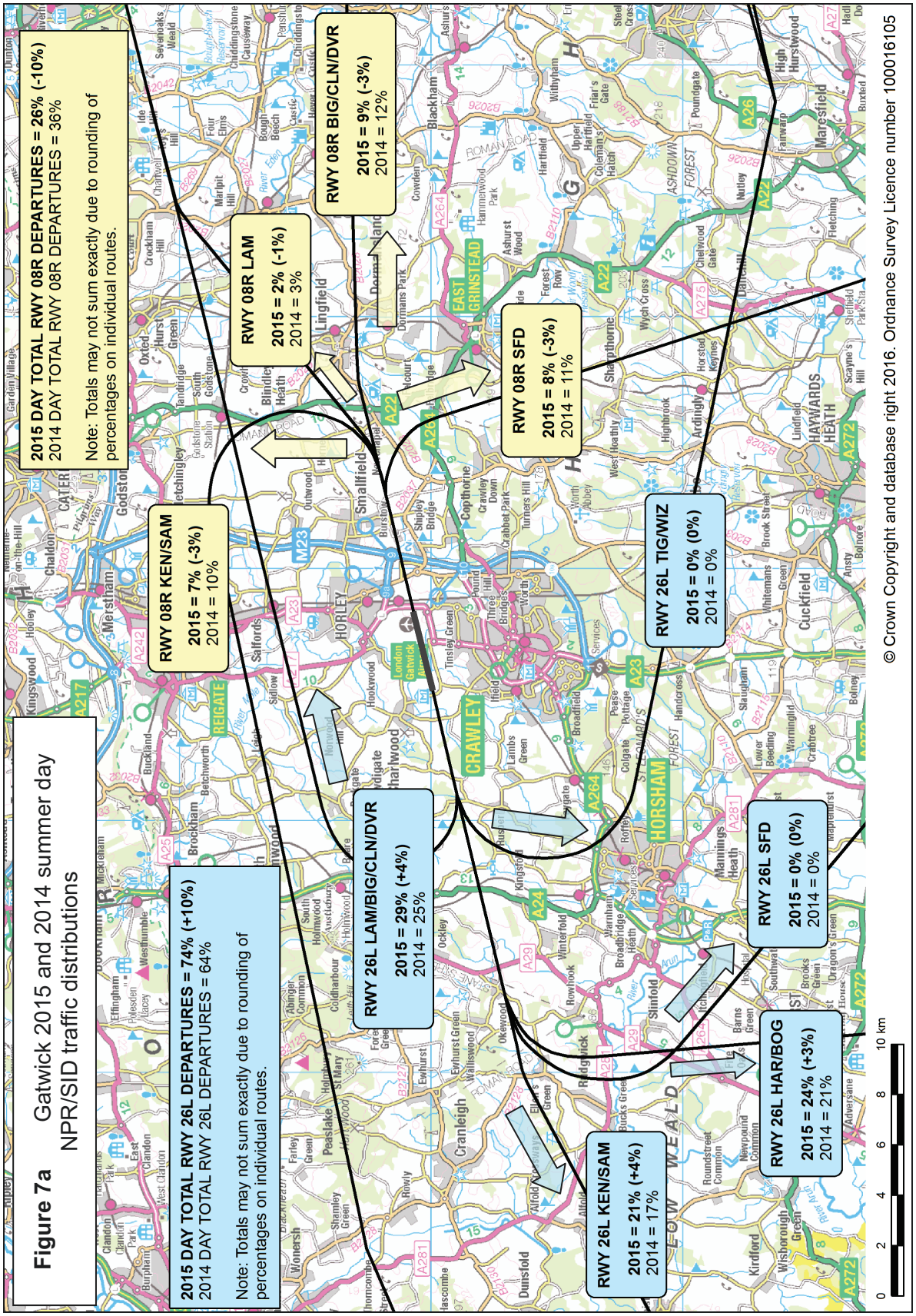


Figure 7a
Gatwick 2015 and 2014 summer day NPR/SID traffic distributions
2015 DAY TOTAL RWY 26L DEPARTURES = 74% (+10%)
2014 DAY TOTAL RWY 26L DEPARTURES = 64%
Note: Totals may not sum exactly due to rounding of percentages on individual routes.
2015 DAY TOTAL RWY 08R DEPARTURES = 26% (-10%)
2014 DAY TOTAL RWY 08R DEPARTURES = 36%
Note: Totals may not sum exactly due to rounding of percentages on individual routes.
RWY 08R KEN/SAM
2015 = 7% (-3%)
2014 = 10%
RWY 08R LAM
2015 = 2% (-1%)
2014 = 3%
RWY 08R BIG/CLN/DVR
2015 = 9% (-3%)
2014 = 12%
RWY 08R SFD
2015 = 8% (-3%)
2014 = 11%
RWY 26L LAM/BIG/CLN/DVR
2015 = 29% (+4%)
2014 = 25%
RWY 26L TIG/WIZ
2015 = 0% (0%)
2014 = 0%
RWY 26L SFD
2015 = 0% (0%)
2014 = 0%
RWY 26L KEN/SAM
2015 = 21% (+4%)
2014 = 17%
RWY 26L HAR/BOG
2015 = 24% (+3%)
2014 = 21%
0 2 4 6 8 10 km
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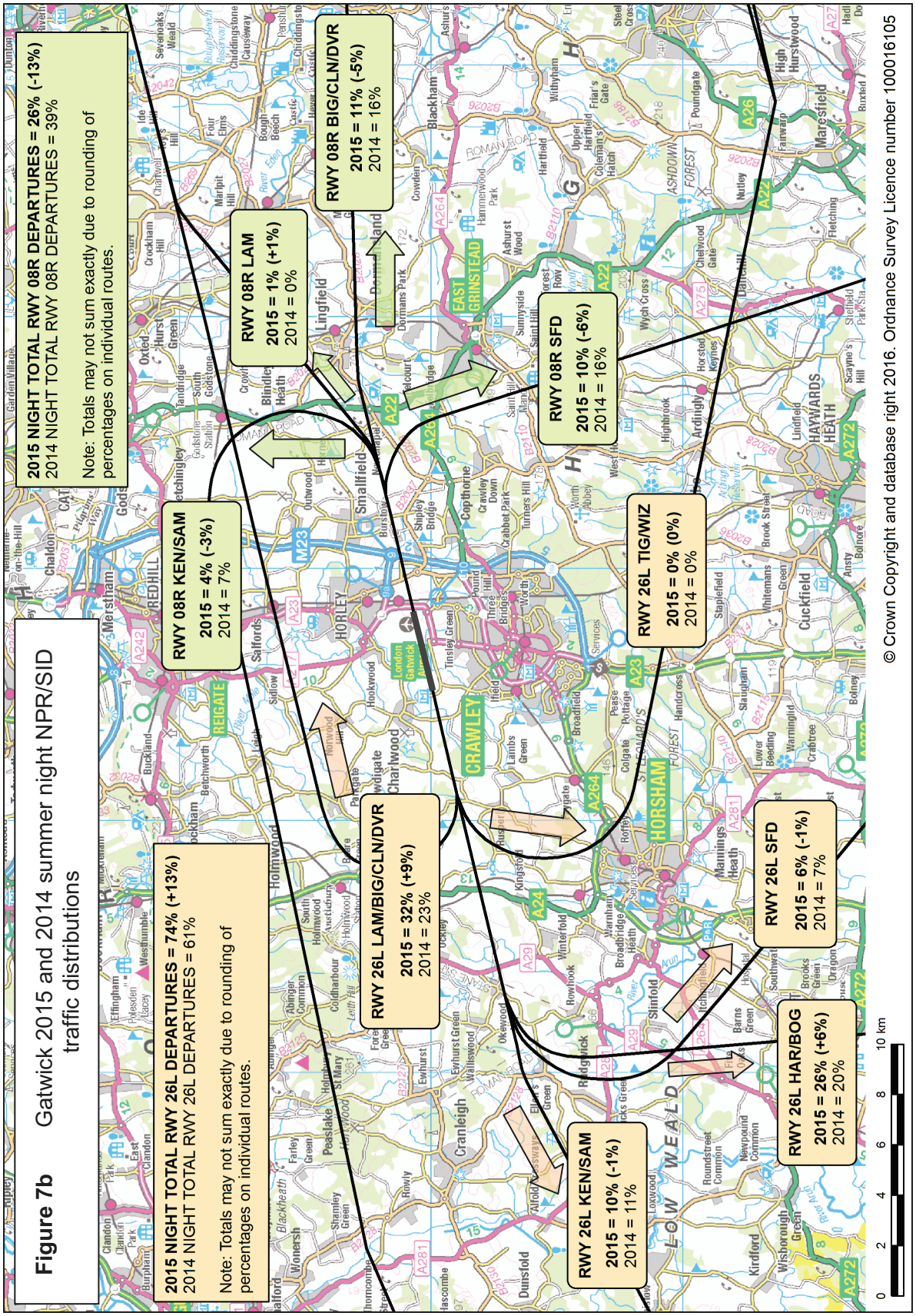
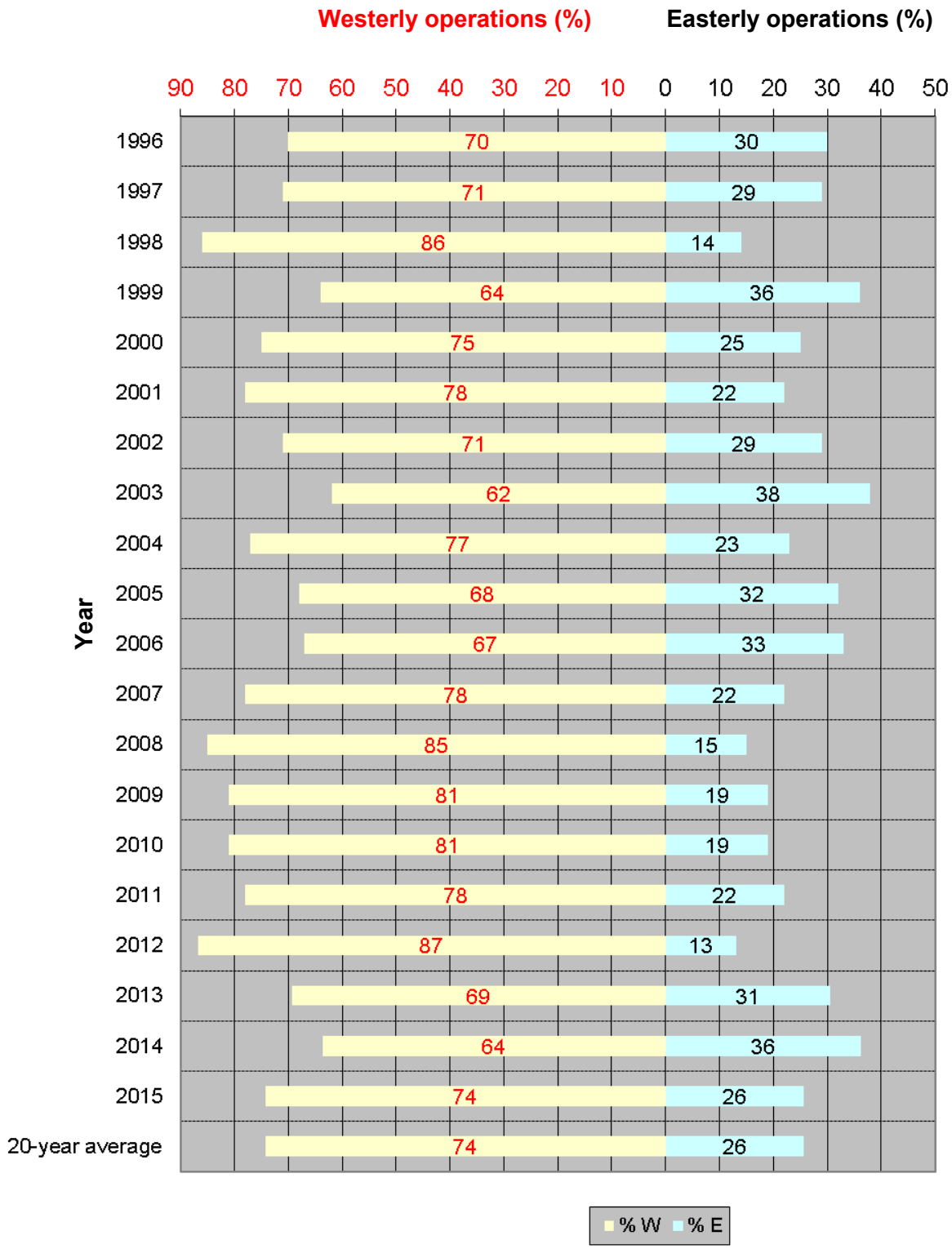


Figure 7b Gatwick 2015 and 2014 summer night NPR/SID traffic distributions

Figure 8 Gatwick average summer day runway modal splits 1996-2015



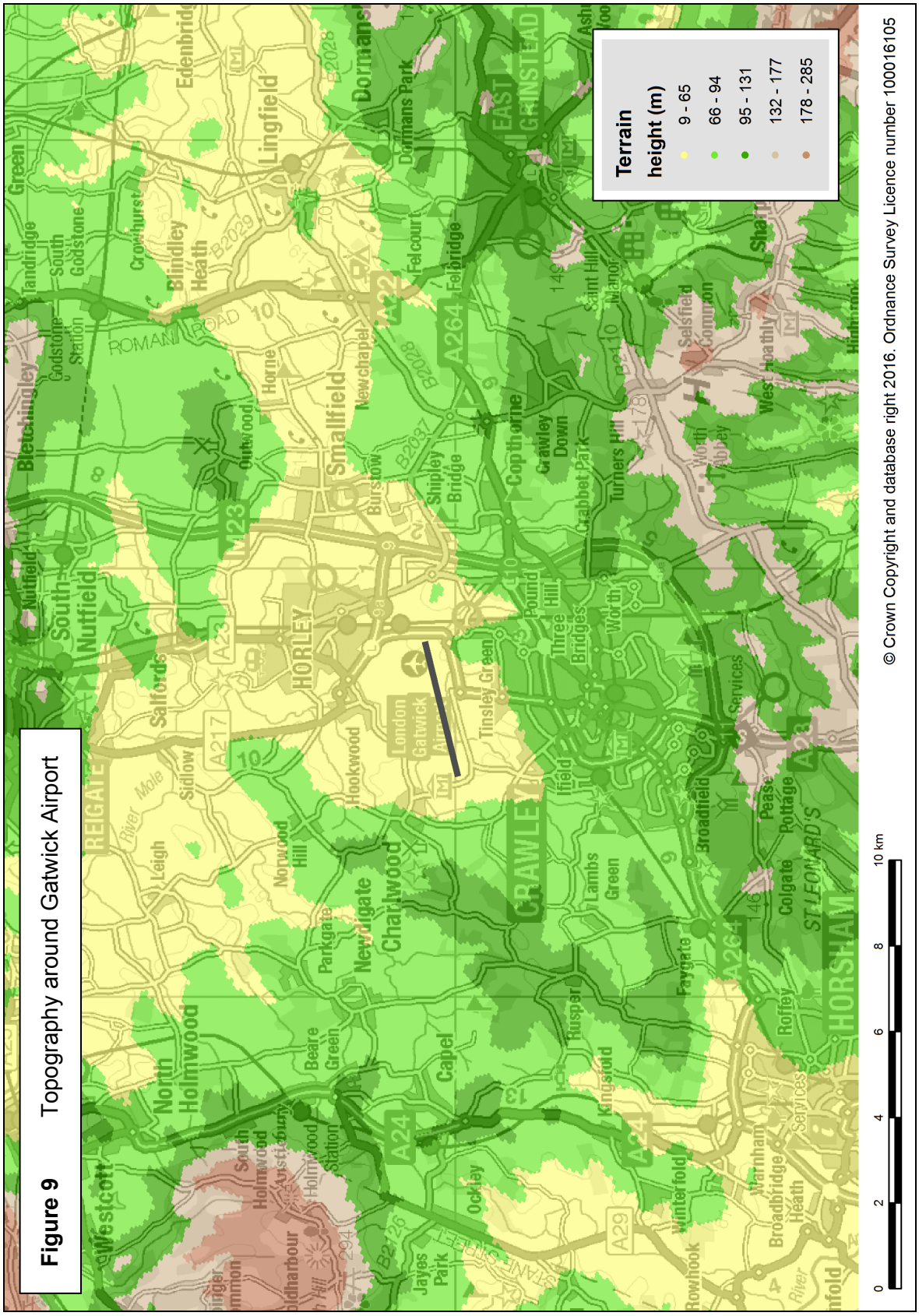


Figure 9 Topography around Gatwick Airport

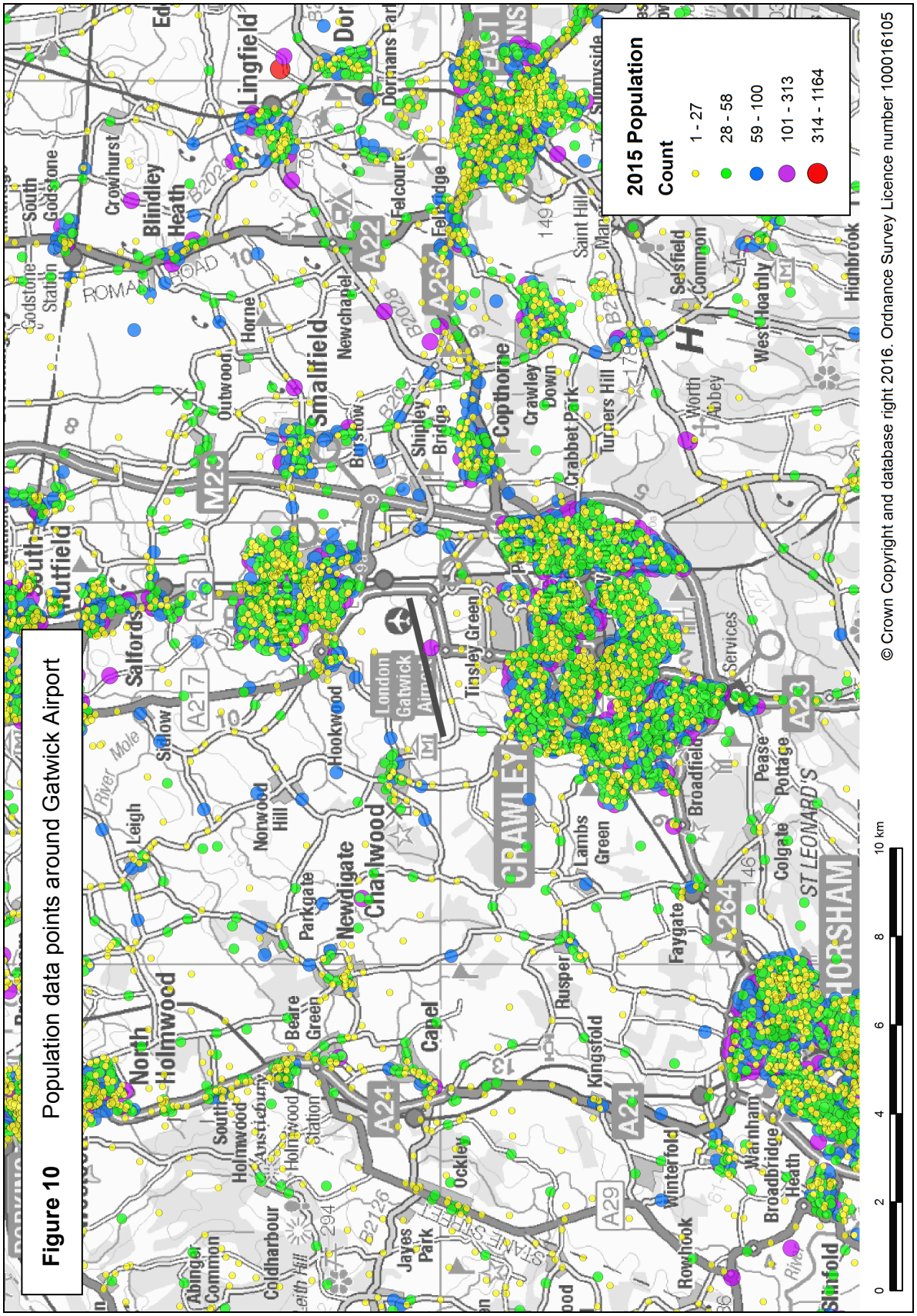


Figure 10 Population data points around Gatwick Airport

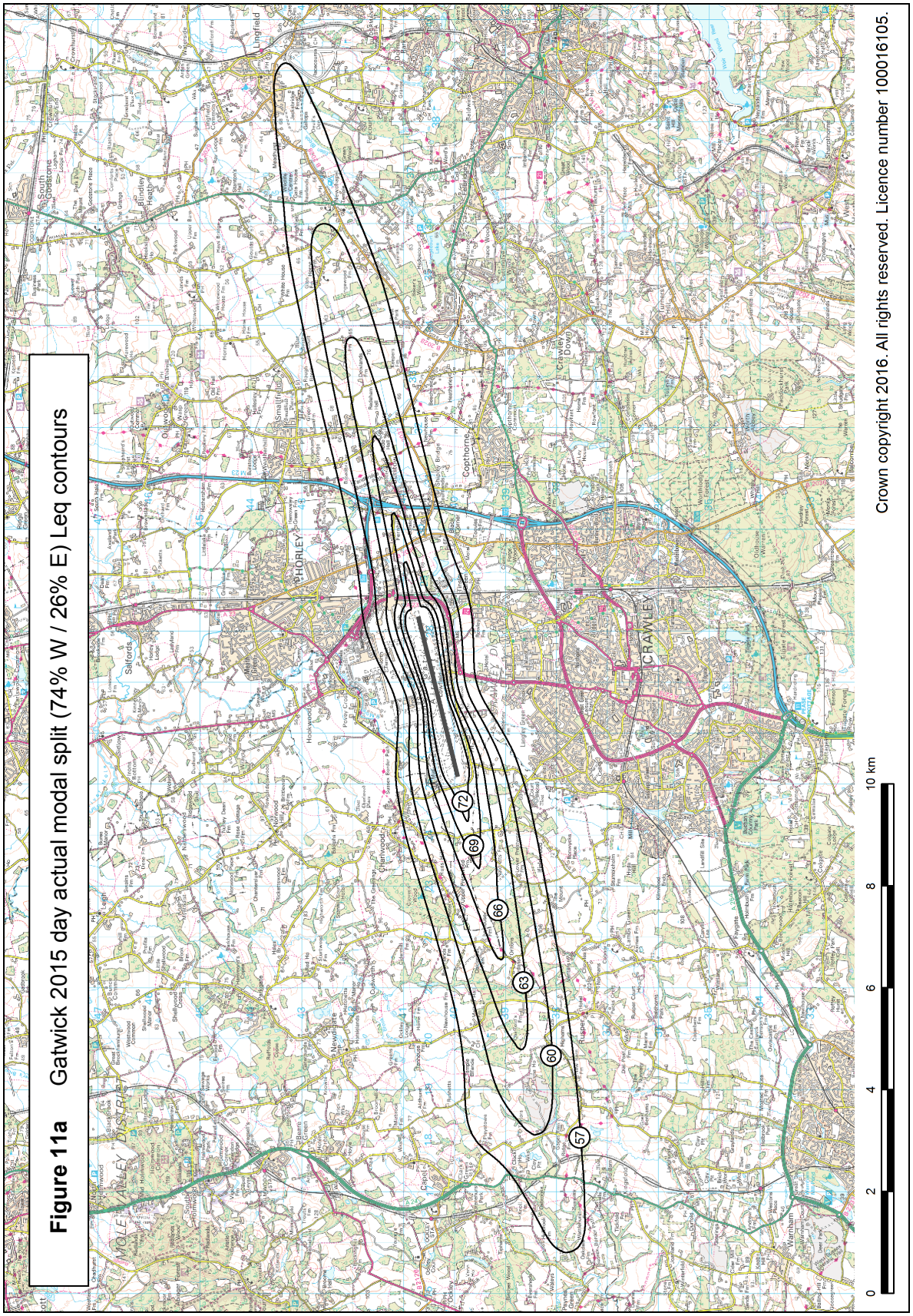


Figure 11a Gatwick 2015 day actual modal split (74% W / 26% E) Leq contours

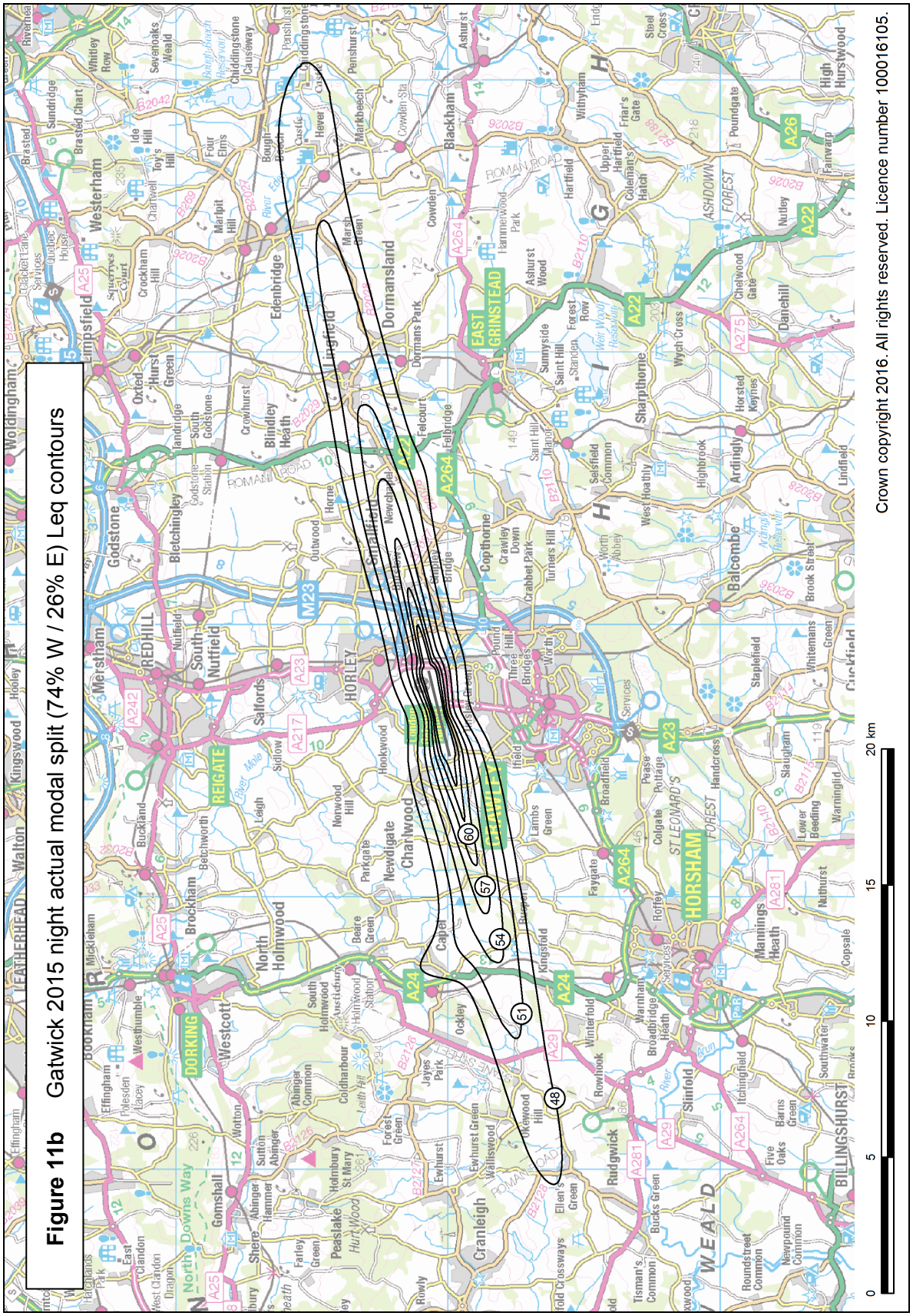


Figure 11b Gatwick 2015 night actual modal split (74% W / 26% E) Leq contours

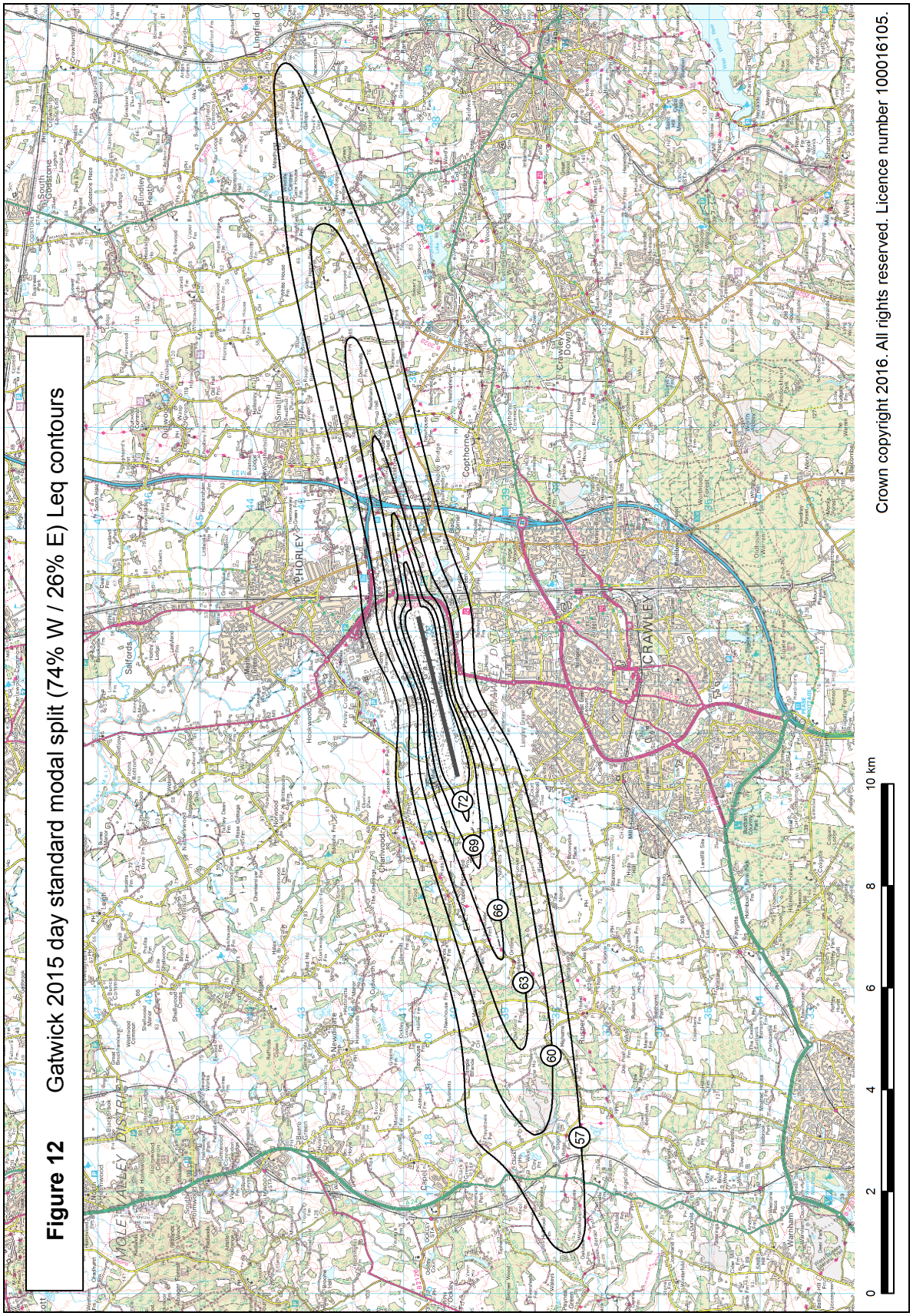


Figure 12 Gatwick 2015 day standard modal split (74% W / 26% E) Leq contours

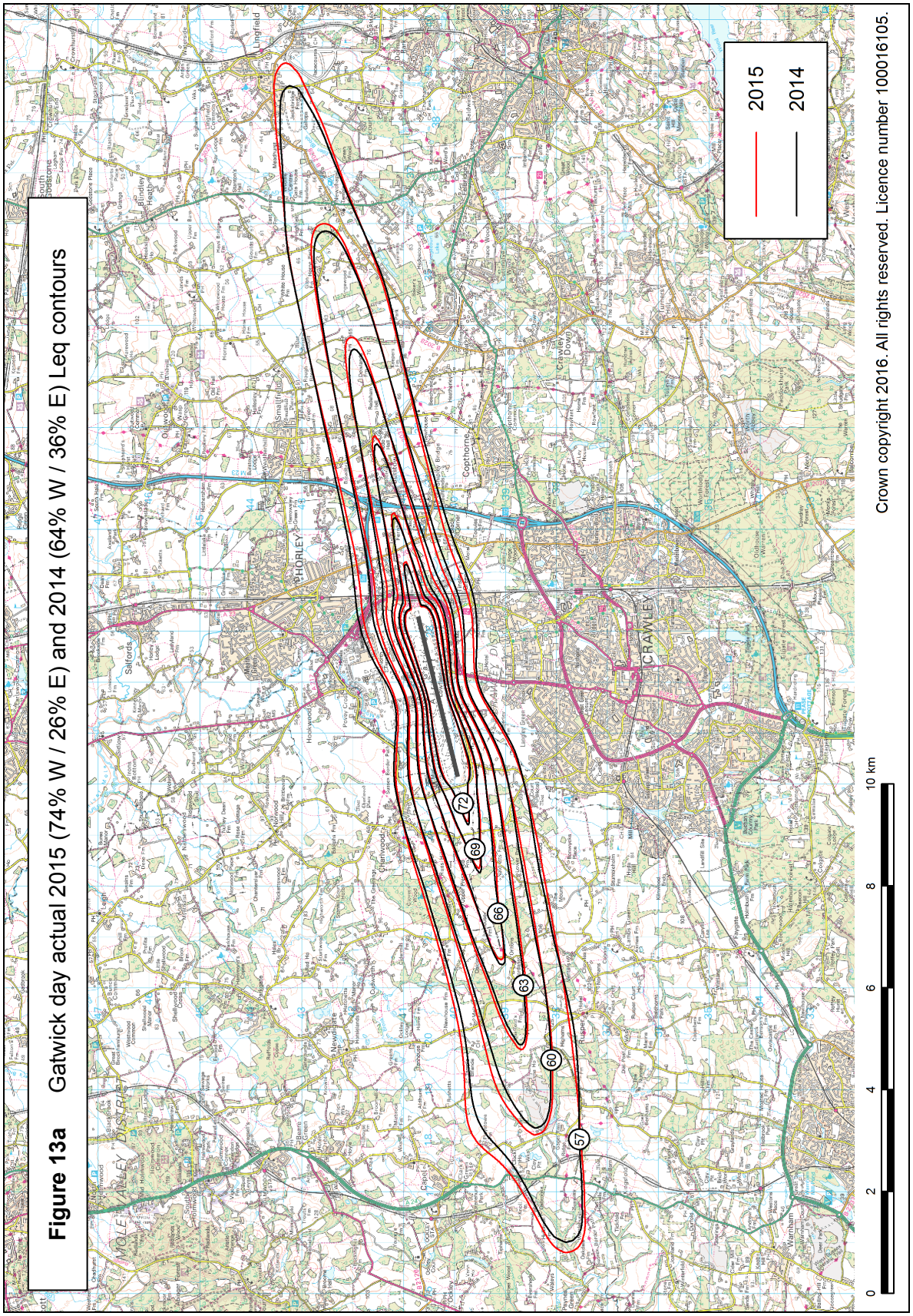


Figure 13a Gatwick day actual 2015 (74% W / 26% E) and 2014 (64% W / 36% E) Leq contours

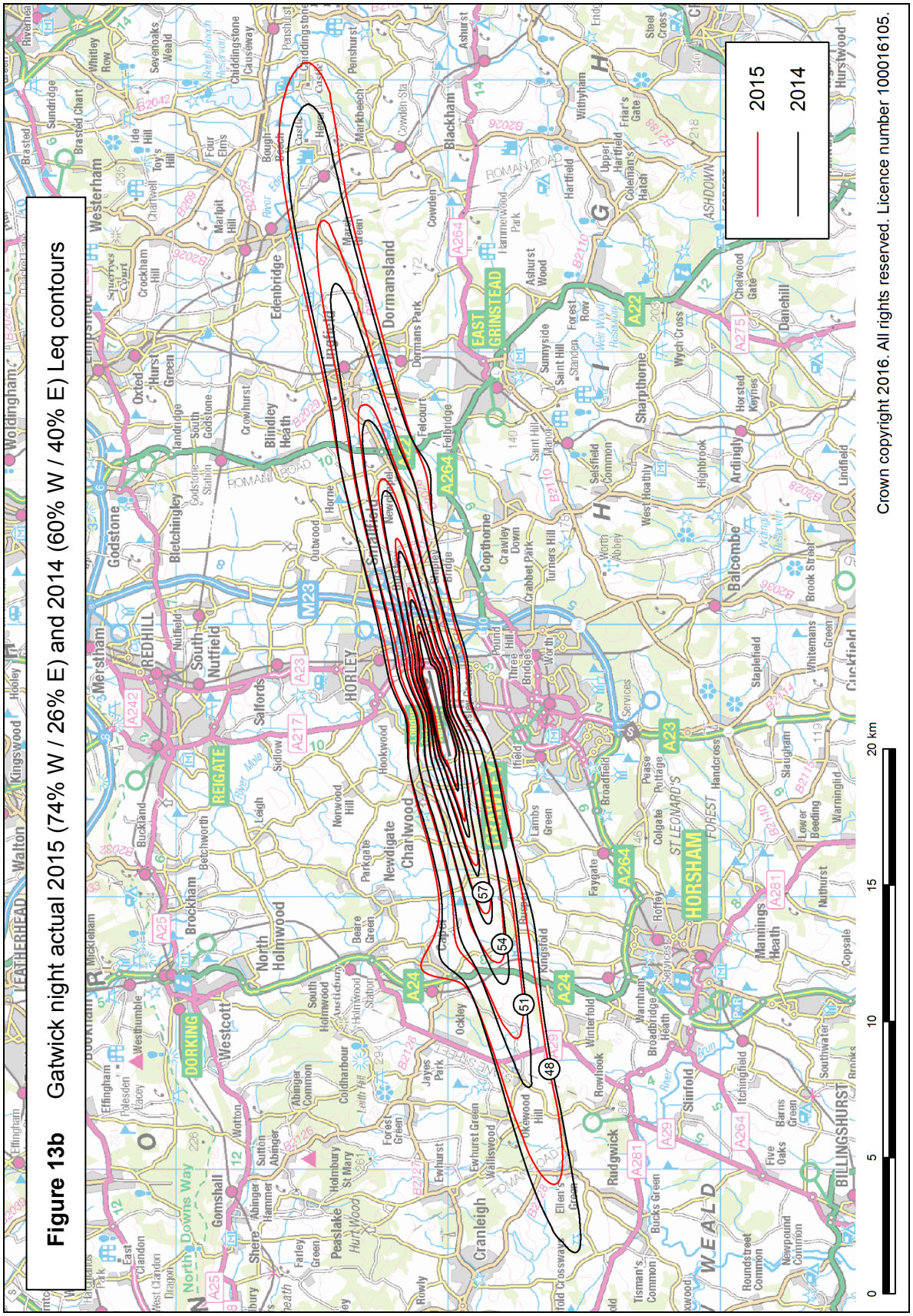


Figure 13b Gatwick night actual 2015 (74% W / 26% E) and 2014 (60% W / 40% E) Leq contours

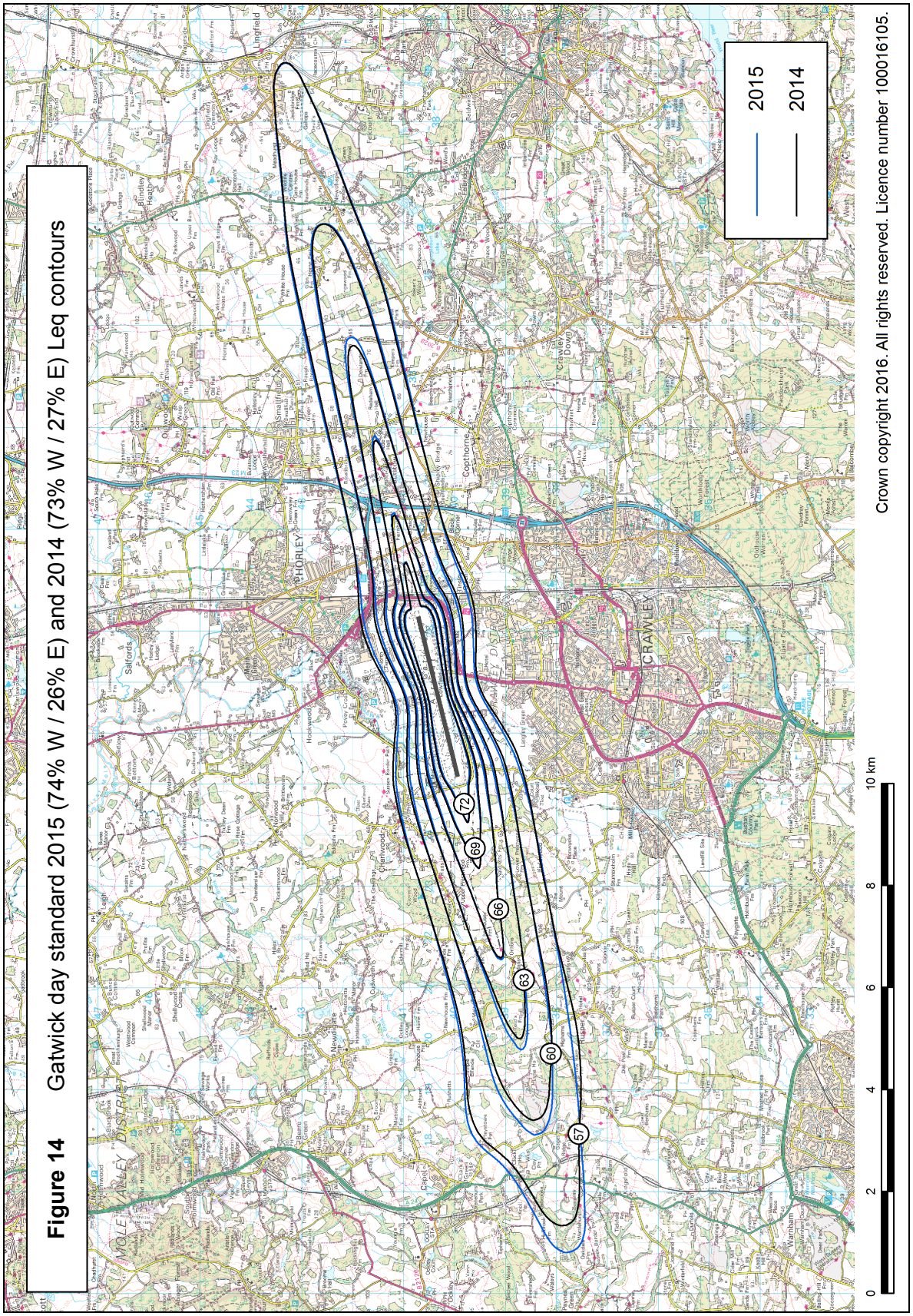


Figure 14 Gatwick day standard 2015 (74% W / 26% E) and 2014 (73% W / 27% E) Leq contours

Figure 15 Gatwick annual traffic and summer day Leq noise contour area/population trend 1988-2015