2017
Operations Monitoring Report

Produced by:
Bristol Airport
Bristol
BS48 3DY

Contents

1. INTRODUCTION

We are committed to sustainable development and minimising our impact on the environment and the local community. This report provides statistical information on the operational activities which occur at the Airport and associated monitoring of environmental performance during 2017. It is the eleventh comprehensive annual monitoring report prepared by the Airport.

This report is presented to the Bristol Airport Consultative Committee to enable key stakeholders to monitor our performance and to demonstrate progress against the requirements of the 2011 planning permission for development and the Noise Action Plan.

2. SUMMARY AND KEY YEAR HIGHLIGHTS

- Total[1] passenger numbers increased by 8% to 8,232,628.
- Aircraft movements increased by 3% to 76,212.
- Dublin was the most popular destination from Bristol.
- Noise monitoring indicates that the noise climate at the noise monitors remains stable. The peak departure noise levels recorded were below the noise infringement limits and broadly similar to 2016 levels.
- The area of the 57 dB(A) Leq 16hr noise contour for summer 2018 is predicted to be 10.9 sq. km, remaining within the permitted noise envelope.
- 172 complaints about aircraft noise were recorded in 2017, an increase from 167 in 2016 and a decrease from 173 in 2015.
- During the summer season there were 2,991 aircraft movements using 1,354 quota count points, during the night quota period of 23:30 to 06:00. A further 3,513 aircraft movements took place during the 'shoulder periods' of 06:00 to 07:00 and 23:00 to 23:30.
- Over 805,500 journeys were undertaken on the Bristol Flyer Airport Express bus service to Bristol, an increase of 0.6% on the previous year. It is estimated that public transport up take was at 12.5% in 2017.
- The air quality monitoring programme shows air quality levels at the Airport remain within Government Air Quality Objectives.
- In 2017, there has been a 7.3% decrease in per passenger carbon emissions compared to 2016.
- Over 99% of general waste generated at the Airport was recycled or reprocessed and diverted from landfill, remaining consistent with 99% in 2016.
- The number of people working at the airport in summer 2017 was 3,459 full time equivalents, up from 3,070 in 2016.
- In 2017, the Local Community Fund provided grants totalling over £143,552 (including monies carried over from previous year) to 53 local projects. A further £20,000 was raised by staff and customers for Children's Hospice South West (CHSW).

[1] Includes all terminal, transit and infant passengers.

3. AIRCRAFT MOVEMENTS

There were a total of 76,212 aircraft movements in 2017 (compared with 73,754 in 2016). The breakdown of aircraft movements is provided in Table 1 below. This data is provisional Bristol Airport data as the CAA data was not finalised at the time of writing. The change in scheduled domestic and charter is mainly due to the introduction of new international routes in 2017 such as Stockholm and Athens by easyJet and the return of direct long haul routes such as Florida and Mexico.

	2017	2016	Change 2016 to 2017
Air transport movements:			
Cargo	0	0	0%
Scheduled domestic passenger aircraft	10,509	11,294	-6.95%
Scheduled international passenger aircraft	45,728	42,937	6.50%
Charter domestic passenger aircraft	1,878	1,942	-3.30%
Charter international passenger aircraft	6,103	5,854	4.25%
Positioning flights	1,402	1,120	25.18%
Other (incl. flying club, private charter)	10,592	10,607	-0.14 %
Total aircraft movements	**76,212**	**73,754**	**3.33%**

Table 1: Aircraft movements

The numbers of aircraft movements for the past twelve years is shown in Figure 1.

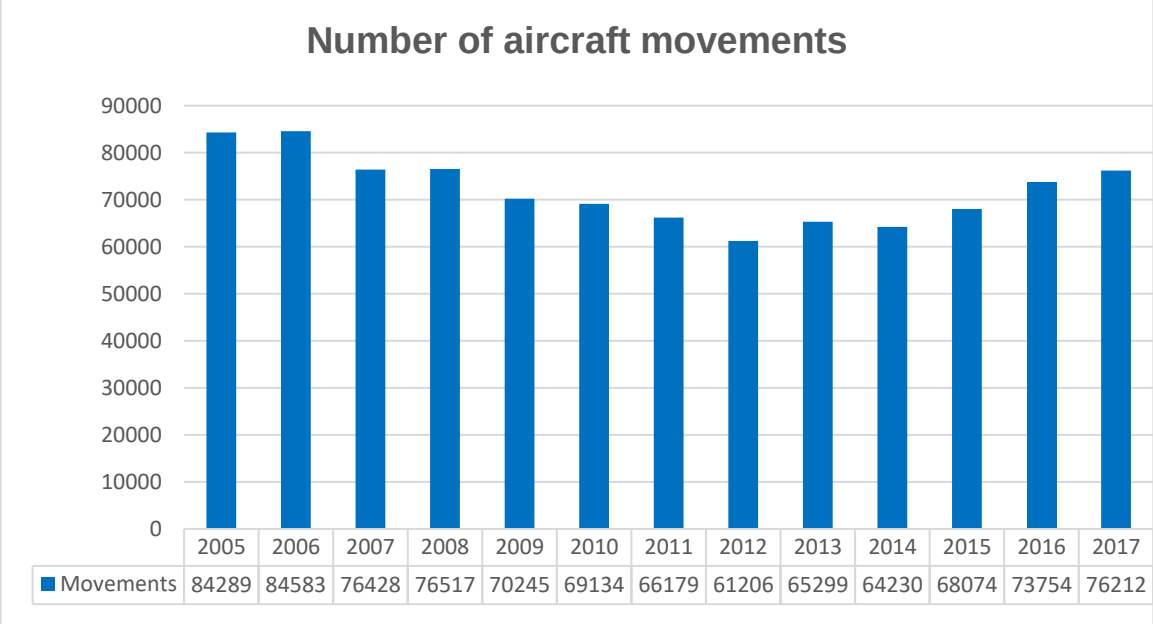


Figure 1: Aircraft movements 2005 to 2017

4. AIRCRAFT TYPES

A breakdown of commercial aircraft by type that used Bristol Airport during 2017 is set out in
Table 2.

Aircraft	Total
A319	16103
A320	14965
A321	1946
A330	8
A400	8
ASTR	6
B462	4
B717	4
B733	36
B734	22
B737	15
B738	11430
B752	2218
B763	4
B76W	2
B788	148
BA46	74
BE40	16
C25A	616
C25C	90
C501	2
C510	111
C525	228
C550	21
C551	2
C560	70
C56X	124
C650	4
C680	18
C750	10
CL30	28
CL60	24
CL80	2
CRJ2	80
CRJX	4
DA62	12
E135	1569
E145	8277
E170	177
E175	60
E190	2792
E195	10
E50P	19
E55P	226
EA50	6
EUFI	10

Aircraft	Total
F100	12
F2TH	150
F70	20
F900	18
FA10	4
FA50	4
FA7X	9
G650	66
GL5T	2
GLEX	40
GLF4	14
GLF5	34
H25B	10
H25C	4
HA4T	2
HAWK	2
HDJT	2
HS25	2
J328	2
LJ31	8
LJ35	22
LJ45	56
LJ55	2
LJ60	6
LJ75	34
MD80	2
MD82	8
MG15	2
PRM1	18
RJ70	2
RJ85	68
SU95	129
Jet	**62355**
AEST	2
AT43	30
AT45	180
AT75	1100
AT76	2964
B190	2
B350	6
BE18	2
BE20	1466
BE30	2
BE35	4
BE36	4
BE58	6

Aircraft	Total
BE76	22
BE90	2
BE9L	18
BN2T	2
C130	6
C150	580
C172	219
C177	4
C182	286
C206	4
C210	2
C340	2
C421	4
DA40	58
DA42	12
DC3	2
DH8D	18
DR10	2
E300	4
G109	4
G159	4
G2	12
JS31	12
JS41	38
M20T	2
P180	32
P28A	3587
P28T	21
P46T	2
PA31	14
PA32	4
PA34	244
PA44	2
PBY5	4
PC12	37
SB20	26
SF34	4
SPIT	2
SR20	4
SR22	157
TAMP	60
TB20	42
TBM7	10
TBM8	4
TBM9	2
TOBA	102
Turbo Prop	**11447**

Aircraft	Total
A109	44
AS50	2
AS55	14
AS65	75
B06	16
CDUS	8
CH47	6
EC35	2116
EC55	2
EH10	2
EXPL	12
LYNX	2
MD50	6
R22	28
R44	12
S76	12
Helicopter	**2357**

Table 2: Commercial aircraft by type and helicopter movements

5. PASSENGER STATISTICS

The number of passengers using Bristol Airport increased by 8% in 2017. Statistics related to passenger numbers are provided in Table 3.

	2017	2016	Change
Scheduled Domestic	1,314,258	1,277,643	2.87%
Scheduled International	5,760,071	5,274,402	9.21%
Charter Domestic	12,272	10,742	14.24%
Charter International	1,046,230	964,903	8.43%
Other	3,872	4,153	-6.77%
Infants	82,194	76,862	6.94%
Transit	13,731	13,914	-1.32%
Total	**8,232,628**	**7,622,619**	**8.00%**

Table 3: Passenger statistics

The average number of terminal passengers per commercial passenger carrying aircraft is shown in Figure 2.

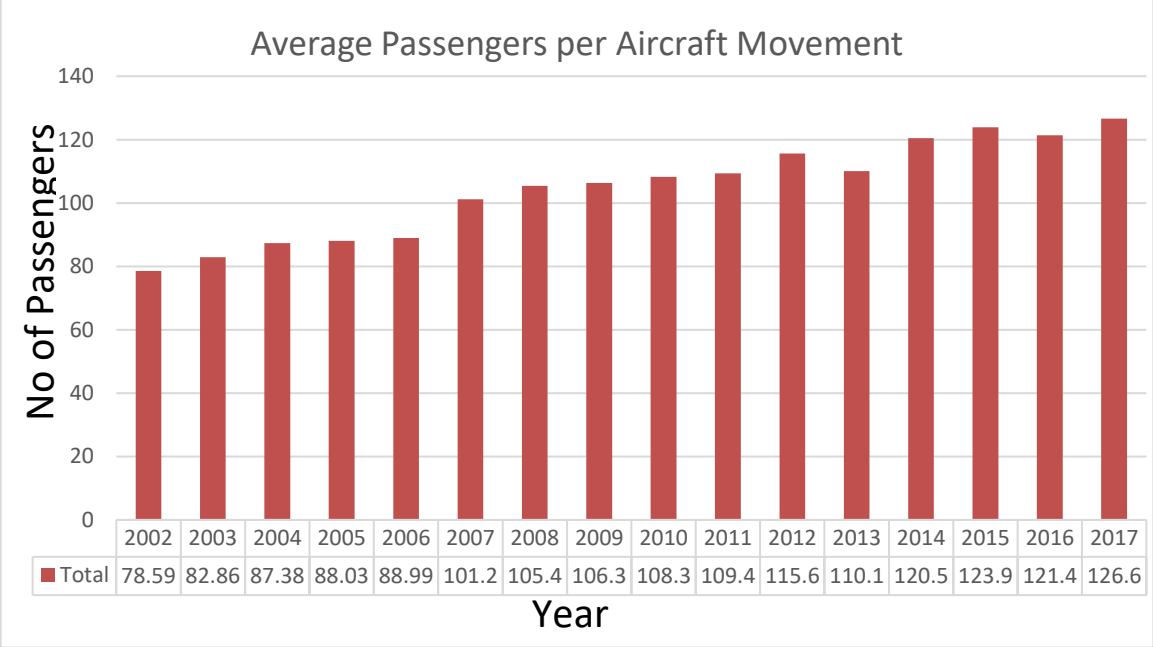


Figure 2: Average Passengers per Flight (total scheduled and charter flights/passengers)

Due to differences in the way some flights are recorded, passenger and aircraft movement figures reported by Bristol Airport may contain small variances when compared to those reported by the UK Civil Aviation Authority (CAA).

6. PASSENGER ROUTES

Table 4 lists the top ten most popular routes in 2017 and 2016.

Destination	2017 Passengers	2016 Passengers
Dublin	**417,446**	391,121
Amsterdam	408,223	**407,680**
Edinburgh	391,401	380,285
Malaga	343,841	334,330
Palma	336,239	336,019
Alicante	328,564	310,782
Glasgow	305,142	296,254
Faro	300,900	287,808
Belfast	259,311	247,336
Geneva	230,476	220,119

Table 4: Top ten most popular routes 2017

7. RUNWAY USAGE

The runway at Bristol Airport is aligned east/west. The runway designation is derived from the compass bearing of each direction. The westerly runway is known as runway 27 and the easterly runway as 09. Runway use is dictated by wind direction. The percentage of movements by runway direction since 2001 is provided in Table 5 below. The average usage over this period has been 78% Runway 27 and 22% Runway 09.

Year	Westerly (27)	Easterly (09)
2001	79%	21%
2002	77%	23%
2003	65%	35%
2004	82%	18%
2005	71%	29%
2006	75%	25%
2007	79%	21%
2008	84%	16%
2009	80%	20%
2010	82%	18%
2011	83%	17%
2012	86%	14%
2013	75%	25%
2014	67%	33%
2015	76%	24%
2016	86%	14%
2017	80%	20%
Average	78%	22%

Table 5: Runway usage 2001 to 2017

8. FLIGHT ROUTINGS

Indicative flight routes for easterly and westerly operations are provided in Appendix A. Flight routes are shown as 3km swathes for departing aircraft on Noise Preferential Routings (NPRs) and arrivals which are established on final approach. The NPRs are to be flown by all departing aircraft of more than 5700 kg maximum certified weight, unless otherwise instructed by Air Traffic Control (ATC) or unless deviations are required in the interests of safety and/or weather. The NPR requires aircraft to climb straight ahead for 4.5 nautical miles when departing on runway 27 and 4.7 nautical miles on runway 09 and to be no lower than 3,000ft above sea level before commencing the turn. The obligations of the NPR cease when an altitude of 4,000ft above sea level has been reached.

Bristol Airport's noise and track keeping system, ANOMS (previously Tracker), is used to monitor adherence to the NPRs and to record continuous descent approaches. Aircraft tracks can be downloaded from www.bristolairport.co.uk/about-us/environment/tracker-online.aspx and viewed using Google Earth.

Bristol Airport works with the airlines and the air traffic services provider, NATS, to promote the use of continuous descent approaches (CDAs). In contrast to conventional airport approaches, aircraft following CDAs descend continuously from as high as possible. A continuous descent requires less engine thrust than level flights and also provides additional noise attenuation by keeping the aircraft higher for longer. In 2017 84% of arrivals were undertaken using the CDA operating technique, a slight decrease on 85.1% recorded in the previous year. An arrival is classified as a CDA if it contains, below an altitude of 6000ft, no level flight, or one phase of level flight not longer than 2.5 nautical miles. CDA performance is regularly reviewed with the airlines at the Flight Operations and Safety Committee in order to improve performance. In 2017, 99.82% of monitored departures conformed to the NPRs.

Bristol Airport reserves the right to levy a surcharge against any operator who, on a persistent basis, fails to operate along the prescribed NPRs as recorded by ANOMS. No such surcharges were levied in 2017.

9. NOISE MONITORING

Bristol Airport continually monitors aircraft noise using three monitors located near Felton, Winford and Congresbury. The Congresbury and Winford (known as Littleton Hill) monitors are positioned in accordance with ICAO standards for monitoring noise from departing aircraft, being positioned 6,500m, from the start of roll from Runway 09 (Littleton Hill) and Runway 27 (Congresbury).

Aircraft using Bristol Airport are required to be operated in the quietest possible manner. Departing aircraft exceeding 90 dB(A) by day (0600 to 2330 local time) and 85 dB(A) by night (2331 to 0559 local time) at the Congresbury and Littleton Hill noise monitoring points will be subject to a penalty as set out in the Airport Fees and Charges. A summary of data relating to departing aircraft from the noise monitoring undertaken in 2017 is provided in Table 6. All departing aircraft complied with the noise infringement limits and no penalties were levied in 2017.

	Peak departures noise level Lmax dB(A)		**Average departures noise level**
Month	**Runway 27**	**Runway 09**	**Runways 09 and 27**
January	80.6 (84.6)	79.8 (80.4)	73.1 (73.4)
February	80.1 (81.2)	80.5 (80.9)	73.3 (73.7)
March	82.8 (81.2)	80.8 (85.2)	73.1 (73.7)
April	83.1 (82.2)	80.2 (80.4)	73.6 (73.6)
May	80.1 (83.3)	80.9 (84.4)	73.7 (74.0)
June	82.1 (84.6)	82.2 (79.6)	73.5 (73.5)
July	82.9 (83.2)	80.9 (78.3)	73.5 (73.1)
August	80.1 (82.1)	79.2 (81.9)	73.5 (73.3)
September	80.4 (80.2)	80.6 (82.1)	73.8 (73.5)
October	80.1 (81.7)	80.6 (83.2)	73.3 (73.6)
November	80.4 (80.6)	78.7 (78.5)	73.2 (72.9)
December	80.3 (79.0)	81.6 (80.1)	73.5 (73.0)

Table 6: Noise monitoring - departing aircraft from Congresbury and Littleton Hill noise monitoring points (2016 data in brackets)

The noise climate recorded at the three noise monitors is provided in Table 7.

	Congresbury		Littleton Hill		Felton	
Month	**2017**	**2016**	**2017**	**2016**	**2017**	**2016**
	Leq dB(A)	**Leq dB(A)**	**Leq dB(A)**	**Leq dB(A)**	**Leq dB(A)**	**Leq dB(A)**
January	58.0	60.3	58.0	57.6	59.8	60.2
February	58.7	61.1	58.0	61.0	60.8	61.5
March	58.8	60.3	59.4	56.8	60.9	59.9
April	58.4	60.2	55.2	56.8	60.0	60.3
May	58.7	59.8	55.8	55.8	60.5	60.6
June	58.4	59.7	57.6	56.3	61.6	61.1
July	57.8	59.3	56.2	56.3	61.1	60.9
August	58.9	58.7	56.6	56.6	61.2	61.1
September	58.6	57.5	57.1	56.3	61.6	61.0
October	64.4	58.0	57.6	55.1	61.4	60.4
November	63.2	58.2	56.3	54.2	59.7	59.2
December	60.0	58.0	57.3	54.8	N/A	59.7

Table 7: Noise climate

10. NOISE CONTOURS

Conditions 30 and 31 attached to the planning permission for the development of the Airport dated 16 February 2011 require forecast aircraft movements and consequential noise contours over a 92 day period between mid-June and mid-September to be reported to the local planning authority on 31 January each year. Condition 30 refers to the 57dB(A) Leq16hr (0700-2300) contour and condition 31 refers to the 63dB(A) Leq 16hr (0700-2300) contour. Noise predictions have been undertaken using the latest version of the Federal Aviation Authority noise contour modelling software (AEDT 2c SP1), which has replaced the Integrated Noise Model 7.0 used previously. Forecast commercial aircraft movements for summer 2017 have been derived from the airline scheduling system operated and co-ordinated for Bristol Airport by Airport Coordination Limited. General aviation movements have been overlaid onto the commercial aircraft movements based on the assumption that the movements will be as recorded in the summer period of 2016. Movements have been allocated to the 09 and 27 runway directions in accordance with the 16-year average modal split between the two runways for the summer period of 22%/78% (as per Table 5). The area of the 57dB predicted contour for summer 2018 has been calculated at 10.9 sq. km, compared with a limit of 12.42 sq. km set out in planning condition 30. The resulting noise contours are included at Appendix B.

It is important to note, the methodology used to collate this contour doesn't take into consideration:

- Topographical terrain data for the area;
- Final climb and arrival profiles for airline fleets;
- Adjustments to noise emissions to represent measured noise levels at the airport.

If the above were to be included the resulting contour would reduce by 1km in size to 9.6 sq. km for summer 2018. For the purposes of the Noise Insulation Scheme, the updated contour will not be used in 2018.

11. NOISE COMPLAINTS

Bristol Airport operates a dedicated noise complaint telephone number, an email address and a web based system for logging and tracking complaints at www.bristolairport.co.uk. Noise complaints can also be received by post. During 2017, Bristol Airport received a total of 172 complaints relating to aircraft operations through these communication channels. The number of aircraft movements per complaint has increased with 707 in 2017 compared to 442 in 2016. Complaint statistics are provided in Table 8.

	2017	2016	2015
Total number of complaints	172	167	173
Number of individual complainants	100	71	77
Average number of complaints per complainant	1.7	2.4	2.1
Number of aircraft movements per complaint	707	442	393

Table 8: Noise complaints

The distribution of noise complaints by month throughout 2017 is shown in Figure 3.

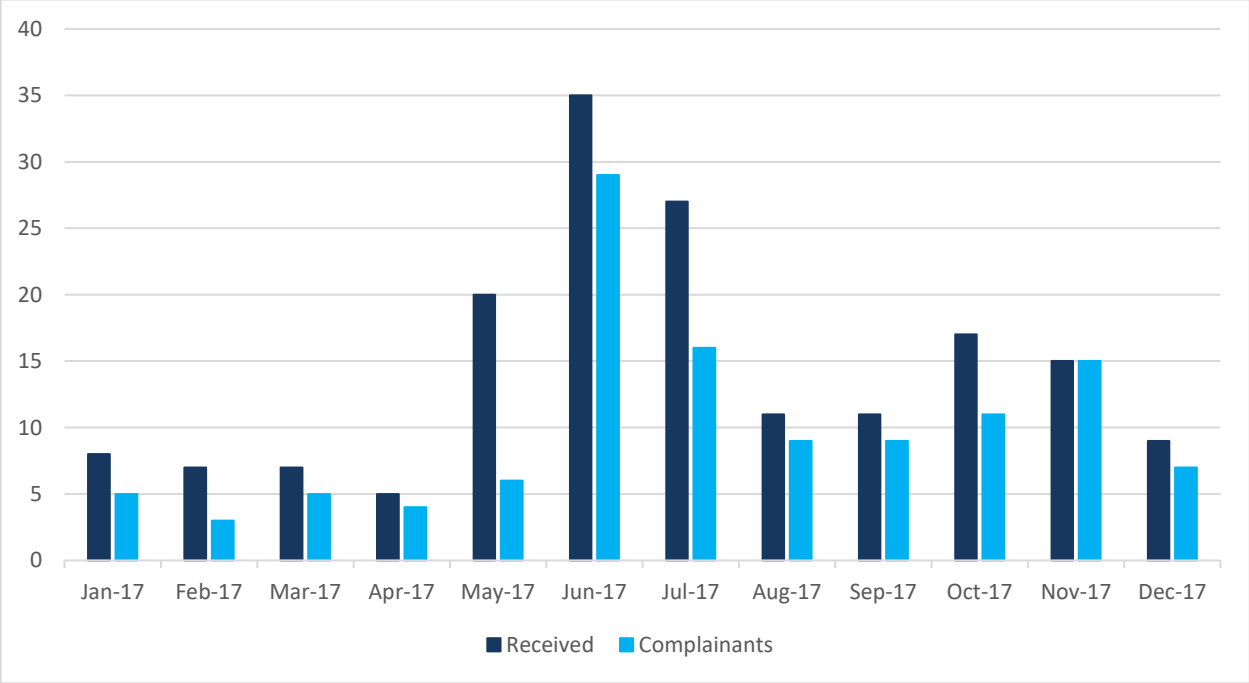


Figure 3 Complaints by month

The nature of complaints, as allocated by complainants, in 2016 and 2017 is shown in Figure 4.

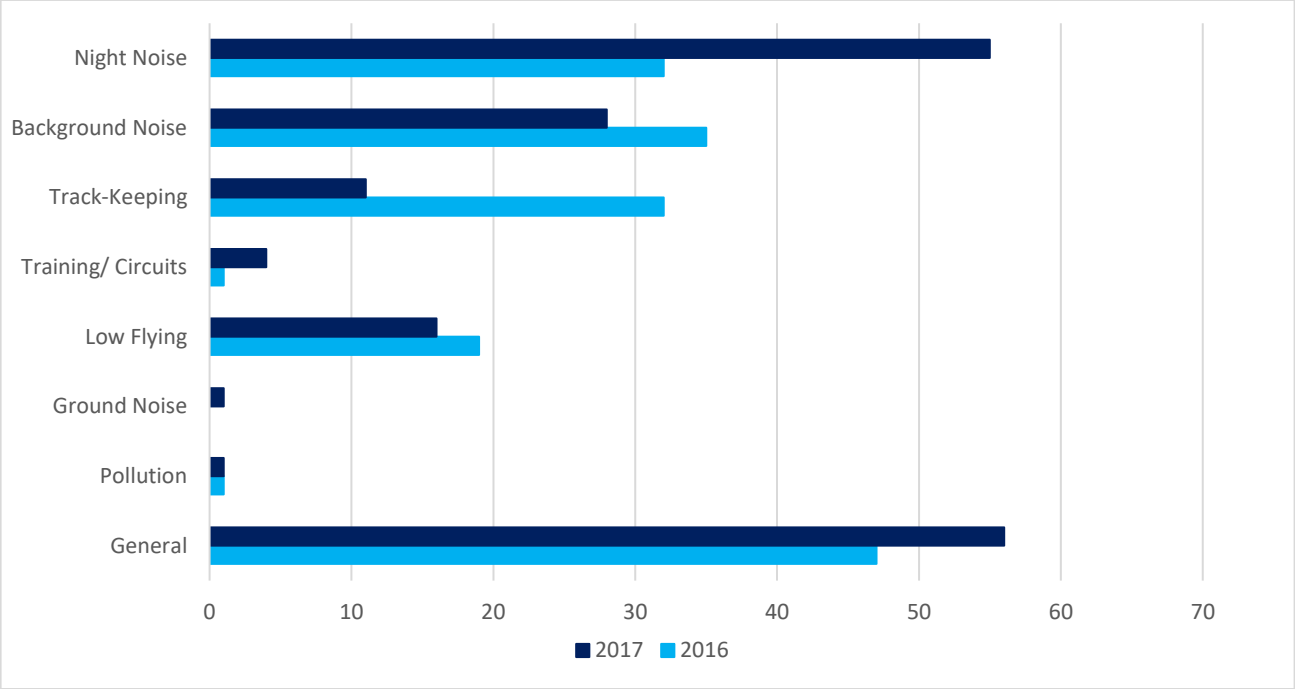


Figure 4: Nature of complaints

The source of noise complaints in 2017, as allocated by the complainants, is indicated by the circles shown on the map in Figure 5.

Figure 5: Location of noise complaints

Key:

- Night
- Track-keeping
- Pollution
- General
- Background
- Training/ circuits
- Low flying
- Multiple

Table 9 identifies the areas from which three or more complaints were received in 2017 compared with 2016. Backwell, Congresbury, Nailsea, Winford and Wrington are areas that are new to having over 3 complaints from each village / town. Out of these new areas the most common cause of complaint was night flights. A number of these are directly associated with media coverage which resulted in a peak of complaints.

Location	Number of complaints	
	2017	2016
Backwell	6	N/A
Bath	5	4
Bristol (City)	N/A	9
Clevedon	5	4
Cleeve	67	86
Congresbury	7	N/A
Dundry/ East Dundry	N/A	6
Felton	14	4
Nailsea	3	N/A
Stockwood	N/A	7
Weston-super-Mare	8	11
Whitchurch	N/A	7
Winford	12	N/A
Wrington	3	N/A
Yatton	3	3

Table 9: Areas with three or more noise complaints during 2017

Figure 6 displays the percentage of complaints based on origin where Bristol Airport received three or more complaints from in 2017. A total of 94% of complaints from Cleeve were by one individual.

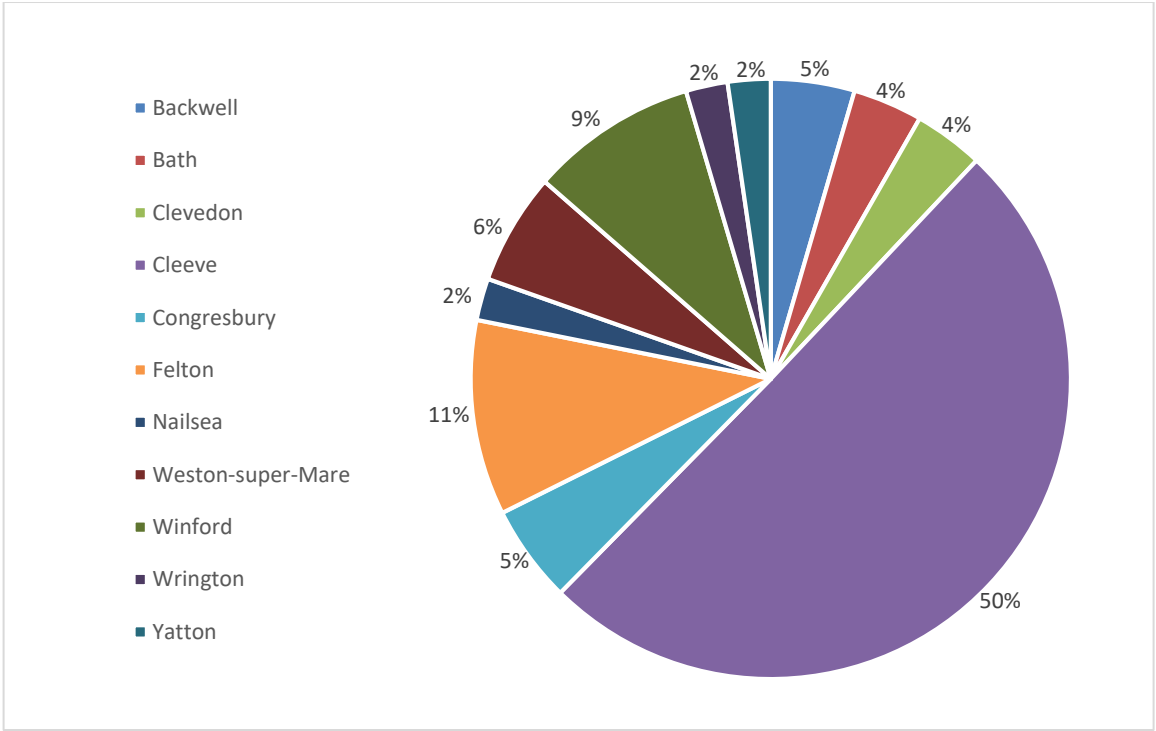


Figure 6: Percentage of complaints by area (areas of three or more complaints), 2017

12. NIGHT NOISE QUOTA USAGE

Night time operations at Bristol Airport are controlled by a noise quota system. The restrictions specify a night period (23:00-07:00) during which time the noisiest types of aircraft may not be scheduled to land or take off. In addition, between 23:30 and 06:00, the night quota period, aircraft movements are restricted by a noise quota limit. Aircraft count against the noise quota according to their quota count (QC) classification.

The quota count itself is related to the noise classification of aircraft as set out in a formal notice published by the CAA on a regular basis. The restrictions allow for dispensations to be given in certain circumstances and there are provisions for dealing with delayed departures and early arrivals. The quota limits are set on a seasonal basis, defined by the period of British Summer Time. The summer season is therefore about seven months long for which a current quota count limit of 1,260 applies. The winter season is about five months long for which a current quota count limit of 900 applies. Up to 10% of the noise quota, if not used in the current season, is carried over to the following season. Similarly up to 10% of the next season's quota may be anticipated in the event of an overrun. Any excess overrun over 10% is penalised in the following season at double the amount of the excess.

The total number of take-offs and landings between the hours of 23:30 and 06:00 shall not exceed 3000 in the summer season and 1000 in the winter season. The total number of take-offs and landings between the hours of 06:00 and 07:00 and between 23:00 and 23:30 shall not exceed 10,500 in any calendar year. Table 10 records the night movements and quota usage since the system came into use.

Year	Night movements		Quota use	
	Summer	Winter	Summer	Winter
1996/97		1251		447.5
1997/98	2334	1238	1124	675
1998/99	2492	1361	1351	765
1999/00	2940	1254	1294	632.5
2000/01	2564	1371	1239	435.5
2001/02	2999	1536	1230	614
2002/03	2655	1386	1150	444.5
2003/04	2960	1033	1378	413.5
2004/05	2082	786	1288	426
2005/06	2183	891	1225.5	472.5
2006/07	2181	163	1138	88
2007/08	2057	939	974.5	451
2008/09	2322	831	1118.5	326
2009/10	2146	816	940	346
2010/11	2984	559	1375.5	216
2011/12	2216	257	1112.5	120
2012/13	1861	253	938	117
2013/14	1888	233	975.5	100
2014/15	2210	232	1145	106
2015/16	2378	244	1180	96.5
2016/17	2704	298	1354*	120.5
2017/18	2991	current	1522*	current

Table 10: Night movements and quota use

*Summer 2016 noise quota was 1354. The allowance is 1260, however as described above the night flying restrictions allow for overrun from the season before and after. In this case 10% of the previous season (90) has been borrowed and a further 4 borrowed from the season to come (winter 2016/17).

**Summer 2016 breakdown is below:

REF	Description	Value
A	Actual QC Summer 2017	1522.5
B	QC Budget Allowance Summer (S)	1260
C	QC Budget Allowance Winter (W) 2016/17	896
D	Initial QC Budget for W2017/18	900
E	10% allowance of QC Budget W2016/17 if unused	89
F	10% allowance of future QC Budget W2017/18	90
G	Running Budget Allowance for Summer 2017 (Ref B+E+F)	1439
H	Remaining QC required (Ref A less G)	83.5
I	Removal of Quota Budget from W2017/18 @ 1:2 ratio to cover quota required for Summer 2017 (Ref G)	167
J	New W2017/18 QC Budget Allowance (Ref C less [F+I])	639

The breakdown of movements in each quota count level in summer 2017 is shown in Table 11 separated in to arrivals and departures.

	Movements	**Quota count use**			
		Exempt	**0.5**	**1**	**2**
Arrivals	2779	36	2733	9	1
Departures	212	37	70	100	5

Table 11: Quota use by aircraft quota count, summer 2017

There were 5,082 movements between the hours of 06:00 and 07:00 and between 23:00 and 23:30 in 2017 compared with 5,182 in 2016.

13. GROUND NOISE MANAGEMENT

Measures adopted by Bristol Airport to minimise the effects of ground noise are set out in a Ground Noise Management Strategy prepared in accordance with the Section 106 Agreement dated 16 February 2011. Progress and key performance indicators against the areas of action are set out below.

Fixed electrical ground power

- Fixed electrical ground power (FEGP) is provided as a primary substitute for the use of aircraft auxiliary power units (APUs) or mobile ground power units. Its use is mandatory where provided and is subject to strict operational rules. Three new

aircraft stands on the Western Apron have been equipped with FEGP and the equipment was used by 456 aircraft turnarounds in 2017.

Ground running of aircraft engines

- Ground running of aircraft engines is necessary as part of the scheduled maintenance undertaken to ensure that aircraft are airworthy and fit for flight. All such activities are subject to strict operational procedures.

	2017	2016	2015	2014	2013
Idle	356	360	300	291	302
Above Idle	39	36	27	22	21

Aircraft auxiliary power units

- Strict operational procedures are in place to control the use of APUs. APU runs between 23:00 and 07:00 are subject to prior approval and there were 24 such runs in 2017 (41 in 2016, 47 in 2015 and 43 in 2014).

Complaints about ground noise

- As noted in section 11 there was no specific complaint about ground noise in 2017.

14. PUBLIC TRANSPORT

The Bristol Flyer Airport Express is the mainstay of the Airport public transport offer. The A1 service links the Airport with Bristol Temple Meads Railway Station, Bristol Bus and Coach Station and the city centre.

In November 2017, First (the bus contractor responsible for the Flyer service) upgraded its on board ticketing machines. This has resulted in revised figures being reported, see below:

Airport Flyer	2016	2017	+/- %
Previously reported	939,306	N/A	N/A
Revised actual	800,853	805,518	0.6%

The service carried 805,518 passengers in 2017, an increase of 0.6% compared with the previous year. The Flyer service is available to Airport staff for a nominal charge and plays a valuable role in getting employees to work, accounting for 133,556 staff journeys in 2017.

It is estimated that public transport up take was at 12.5% in 2017.

In previous reports we have provided passenger numbers on the Bristol Flyer over the past ten years however, due to data changes as explained, below are the number of journeys made on the Flyer since 2013 in Figure 7.

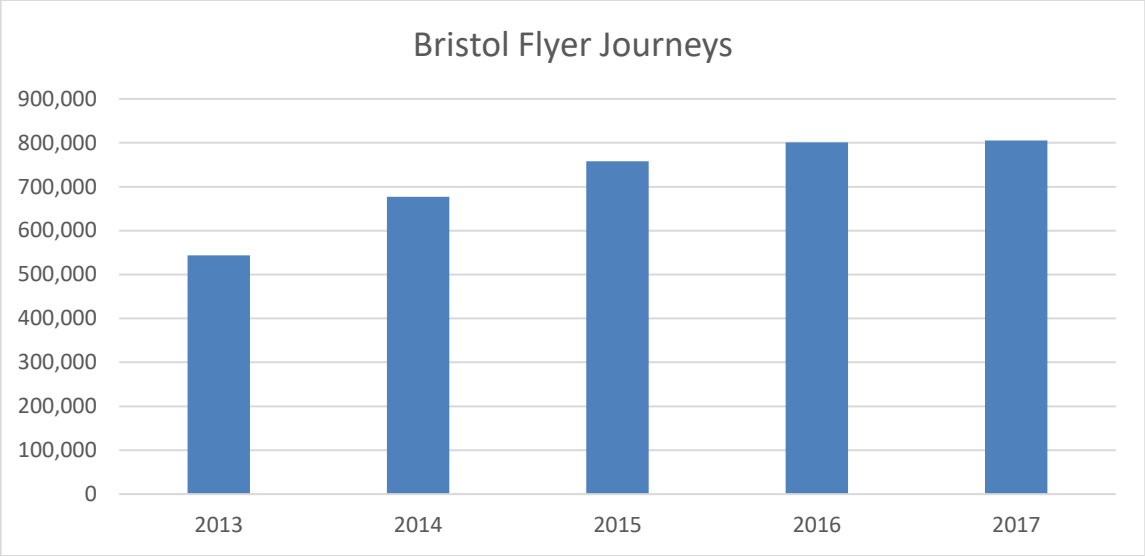


Figure 7: Flyer passenger journey numbers 2013 to 2017

Other public transport services operating during 2017 included the Bristol Airport Express coach from Cardiff operated by National Express, the Bath Bus Company Air Decker service from Bath, the Stagecoach Falcon from Plymouth and the A2 Link connecting Weston-super-Mare with the Airport.

15. AIR QUALITY

Air quality can be affected by a number of pollutants that in high concentrations may pose harm to human health. Combustion processes produce Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}) with the main potential airport sources coming from vehicle traffic (staff and passenger journeys and airport operational vehicles), aircraft engines (during taxiing, take-off and landing), energy generation (diesel generators and gas boilers), fugitive emissions (evaporation - during fuelling of aircraft and vehicles) and other activities such as fire training.

This section considers air quality at Bristol Airport during 2017, comparing recorded concentrations with the UK's Air Quality Strategy and against the commitments contained within Bristol Airport's S106 Agreement with North Somerset Council.

The National Air Quality Strategy (NAQS) forms the legislative basis for air quality in the UK, stipulating long and short term objectives to ensure air quality does not result in health issues.

National Air Quality Strategy Objectives

Pollutant	Annual objective (mean limit)	Short term objective. (max events per annum)
NO_2	40 µg/m^3	18 hourly means > 200 µg/m^3
PM_{10}	40 µg/m^3	35 daily means > 50 µg/m^3

Section 106 Agreement

- Highlight air quality monitoring locations where monitored levels exceed 90% of the National Air Quality Strategy limit
- Report significant deterioration in air quality, defined as an increase in average annual concentration of more than 15% compared to the average levels recorded between 2007 – 2011 (NO_2) or particulate levels exceeding 50 µg/m^3 in more than 15 days in a calendar year (PM_{10})

Monitoring of air quality is undertaken continuously, with real time monitors recording levels of both NO_2 and PM_{10} at the Airport site. Additionally, passive diffusion tubes are deployed to monitor average monthly NO_2 concentrations at nine locations across the Airport site, including the location of the continuous air quality monitor. The locations of the monitors are shown in Figure 8.

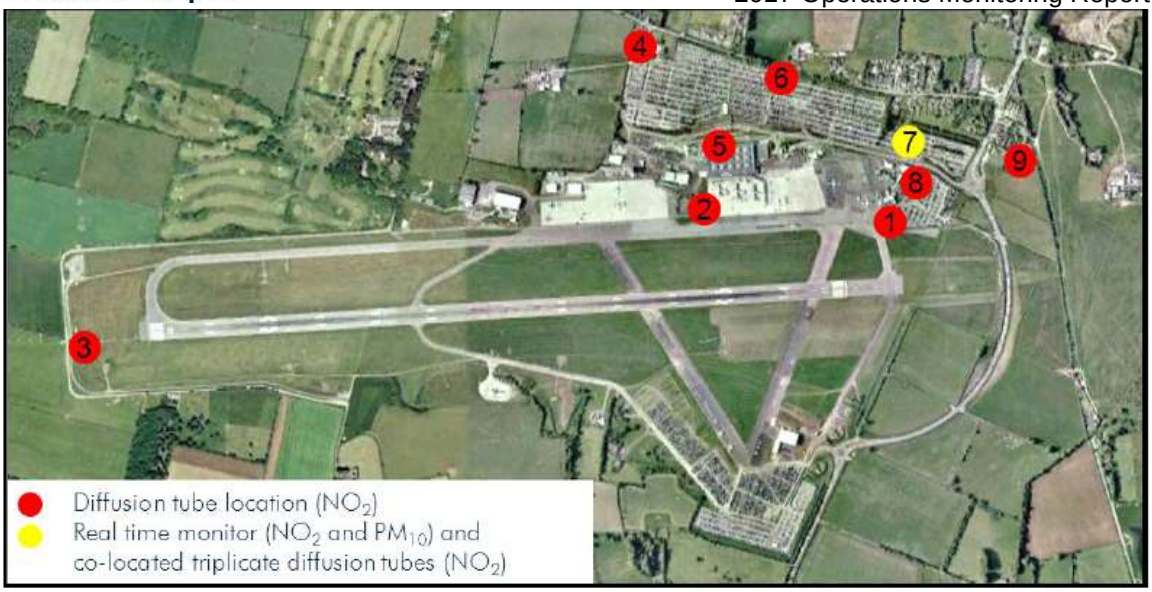


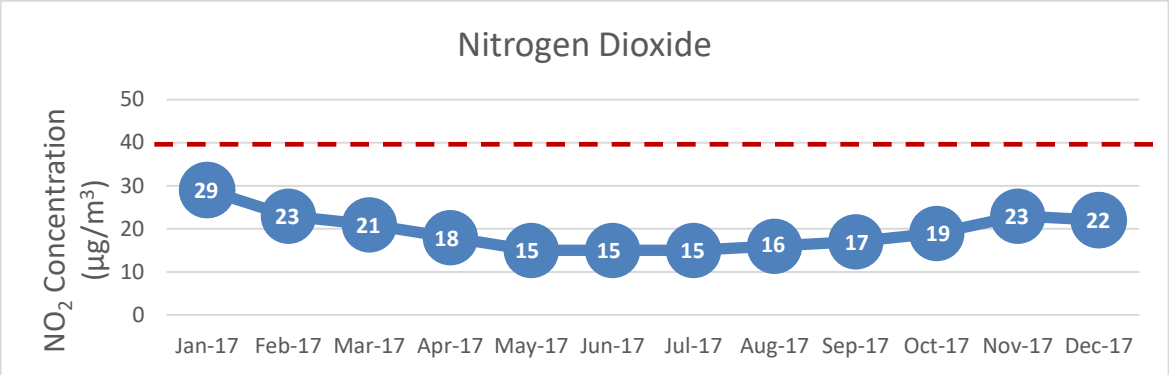
Figure 8: Location of air quality monitors

Ambient concentrations of NO_2 and PM_{10} recorded by real time monitoring in 2017 are shown in Table 12 with analysis against NAQS and S106 objectives.

Error! Reference source not found.2: real time monitoring with analysis against NAQS nd S106 objectives

Five year baseline data is derived from historic monitoring prior to 2012. The current air quality monitoring programme includes a number of sites which were not monitored prior to 2012 and therefore a five year baseline is not available at all locations. After 2017, a five year baseline will be available running from 2013 – 2017 where necessary (not required as per S106 agreement).

Monthly ambient concentrations recorded by real time monitoring are detailed in Figure 9.



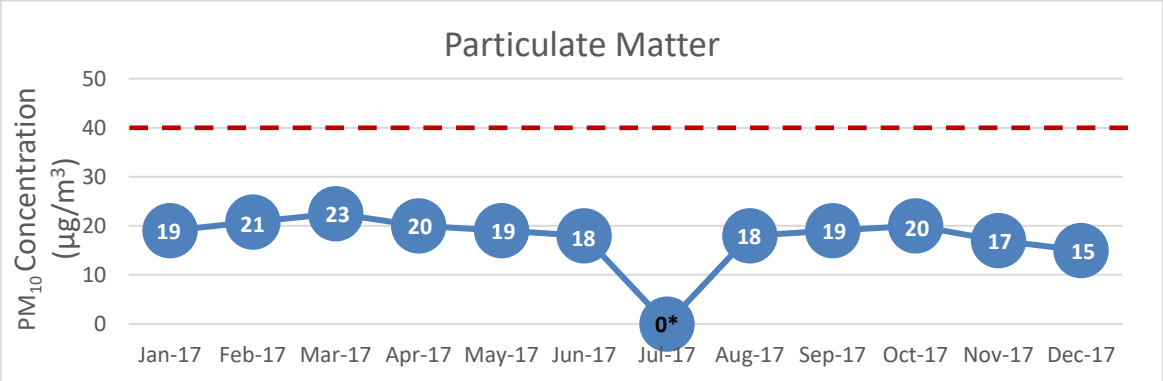


Figure 9: Monthly concentrations NO_2 and PM_{10} recorded by real time monitoring

*Please note the July 2017 air quality report was retuned as 'Invalid' due to a technical fault with data not being supplied to server, this has now been rectified and is checked on a regular basis.

NO_2 levels recorded by diffusion tube monitoring are shown in Table 13 with analysis against NAQS and S106 objectives.

Monitoring Location	5yr Baseline (µg/m3)	Recorded Annual Mean (µg/m3)	NAQS Compliant	Annual Mean <90% NAQS Objective	Significant Deterioration
1	34	37	Yes	Yes	No
2	39	35	Yes	Yes	No
3	16	10	Yes	Yes	No
4	N/A	14	Yes	Yes	N/A
5	38	34	Yes	Yes	No
6	N/A	21	Yes	Yes	N/A
7	N/A	24	Yes	Yes	N/A
8	50	38	Yes	Yes	No
9	N/A	24	Yes	Yes	N/A

Table 13: Diffusion tube monitoring results[2]

[2]Diffusion tube monitoring results are reported following the removal of anomalous data and bias adjustment in line with Defra Guidance. The baseline data is based on data collected between 2007 and 2011.

16. WASTE MANAGEMENT

Bristol Airport Limited manages all the waste streams from property under its control (including terminal and administration waste). The waste figures for 2017 and 2016 are shown in Table 14.

Waste stream	2017		2016	
	Total (tonnes)	Waste per passenger (kg)	Total (tonnes)	Waste per passenger (kg)
Recycled waste				
• Cardboard	96.36	0.01	77.22	0.01
• Glass	189.67	0.02	158.99	0.02
• Plastic bottles	13.44	<0.01	6.62	<0.01
• Mixed (incl. paper/plastic/cans)	162.23	0.02	173.01	0.02
Total recycled waste	594.45	0.07	415.85	0.05
Food waste to Anaerobic Digestion	113.87	0.01	85.47	0.01
Waste treated and sent to Energy from Waste	832.21	0.10	842.62	0.11
Waste to landfill	2.13	<0.01	11.97	<0.01
Total waste removed from BIA	1428.63	0.17	1355.91	0.18
% waste recycled or recovered	99.85%		99.12%	
% waste recycled on site (including food waste)	49.6%		37.0%	

Table 14: Waste management

17. UTILITIES & ENERGY MANAGEMENT

Bristol Airport is committed to continuing to measure energy use across the site and seeking to limit emissions. A range of actions are taking place to reduce the carbon intensity of the airport infrastructure, with the long term goal of reducing per passenger carbon emissions.

Bristol Airport calculate the company footprint in accordance with the Airports Council International's (ACI's) Airport Carbon Accreditation (ACA) Scheme. ACI's ACA is endorsed by the European Civil Aviation Conference (ECAC), the European Organisation for the Safety of Air Navigation (EUROCONTROL) and the United Nations Framework Convention on Climate Change (UNFCCC). Over 120 airports across the world are also accredited.

airport carbon accredited MAPPING

Bristol Airport has achieved the first level of certification in the ACA scheme during 2015, 2016 and in 2017.

Below is a breakdown of our 2017 Carbon Footprint.

Scope 1

Activity	Component	CO2eq (kg)
Gas use	Natural Gas	626,839
Fleet vehicles	Biodiesel	813,332
Heating/ red diesel	Gas Oil	206,811
Fire Training	LPG	12,309
Company cars	Petrol	3,898
Refrigerants	F-Gas	145,833
	Total Scope 1 tonnes CO2eq	**1,809**

Scope 2

Activity	Component	CO2eq (kg)
Grid electricity	Electricity	4,624,987
	Total Scope 2 tonnes CO2eq	**4,625**
	TOTAL ALL SCOPES tonnes CO2eq	**6,434**

Compared to 2016:

- There has been a 1% increase in absolute carbon emissions
- There has been a 6.7% decrease in per passenger carbon emissions

Bristol Airport's carbon footprint includes all Scope 1 (directly generated) and Scope 2 (indirectly generated) emissions. This includes all directly run infrastructure and vehicles; including:

- Terminal common areas
- Offices and workshops (Administration Building, Northside House, Fire Station, Motor Transport)
- Fleet vehicles (car park buses, airside operations vehicles, fire vehicles, other pool vehicles)
- Air Traffic Control Tower- electricity use (gas for heating is paid for by the tenant).

It includes tenanted common areas but not tenant's units, as operators are accountable for their own energy use in those areas using metered rates.

Recent key achievements in carbon and energy management include:

- Apron flood lighting replaced with LED on western Apron;
- All new Apron flood lighting – stand 7A, central pier etc all LED;
- ATC building communal areas lighting replaced with LED;
- Undercroft lighting replaced with LED;
- Silverzone reception building designed with LED lighting & heat recovery systems;
- Western Terminal Extension with LED lighting & heat recovery systems;

- Terminal Air Handling Unit soft starts replaces with modern Variable Speed Drives controlled from the Building Management System.
- Standard 3, all conveyor drives are PMM (Permanent Magnet Motor) – much more efficient than traditional motors, even when fitted with inverters;
- Baggage hall lighting all upgraded to LED;
- Site-wide energy efficiency campaigns.

During 2018 there are plans to remote control apron lighting, encourage more energy saving opportunities with employees and further engagement with stakeholders. The Airport is also seeking to achieve Stage 2: Reduction in 2018 as part of the ACA Scheme.

18. EMPLOYMENT

Bristol Airport is a major employment site within North Somerset. Regular surveys are undertaken by Bristol Airport to determine the extent and nature of employment available. The number of staff working at the Airport between 2011 and 2017 is reported in Table 12.

	2017	2016	2015	2014	2013	2012	2011
Full time staff	2976	2,669	2,243	2,396	2,241	2,193	2,206
Part time staff	942	801	1,149	600	754	783	715
Total number of staff	3918	3,470	3,392	2,996	2,995	2,976	2,921
Full time equivalents	3459	3,070	2,818	2,696	2,618	2,585	2,564
Number of companies	54	52	52	47	47	44	44

Table 12: Employment

A breakdown of the airport staff headcount by area of employment is provided in Figure 10.

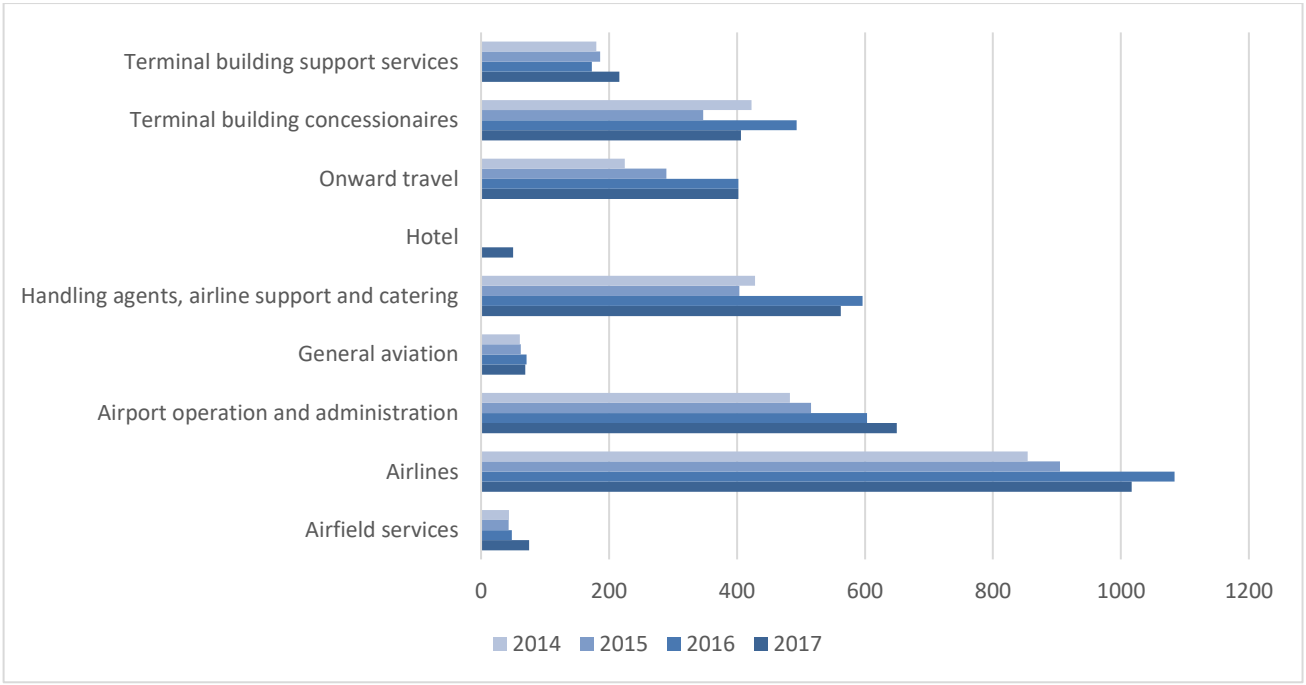


Figure 10: Areas of employment

Bristol Airport's Skills and Employment Plan aims to provide opportunities for local residents, particularly young people, to access jobs at Bristol Airport. The following activities were undertaken during 2017:

- Bristol Airport played host to 15 Work Experience students during July and August from 3 local secondary schools – Backwell, Churchill and St Bedes;
- A number of Jobs Fairs were attended in the early part of 2017 to attract seasonal workers for both BAL and our business partners;
- As part of our ongoing commitment to expand the routes into careers at Bristol Airport, two Industrial Placement schemes have run during 2017, one with Engineering and the other within Security;
- We introduced a new Business Administration Apprenticeship, with the first candidate joining in the final quarter of the year. We are currently recruiting for a second Motor Transport Engineer Apprentice, and have plans to extend our offering to PCV Drivers and Engineers late in 2018;
- A dedicated Resourcing Manager was appointed in September 2017, and they will be joined by a Recruitment Coordinator in the second quarter of 2018, demonstrating our commitment to broadening our activity and ensuring we are effectively communicating with job seekers in our catchment area;
- We invested further in our on-line recruitment portal, created a dedicated Indeed Careers page, and began to work far more collaboratively with the other employers across the airport to make it simpler and easier for job seekers.

19. COMMUNITY RELATIONS

In 2017, Bristol Airport paid £145,420.00 into the Airport Environmental Improvement Fund, also known as the Bristol Airport Local Community Fund. The main purpose of the Fund is to mitigate the environmental and social impacts of the Airport's operations and give something back to the surrounding communities affected by being situated in close proximity to an international airport. It reflects our aim to develop the airport in a sustainable way, respectful of the local community and the environment.

The Fund supports projects in the following areas:

- Initiatives to mitigate the impact of aircraft and ground noise on the local community which may include (but not be limited to) noise insulation for schools and homes in affected areas, the construction of additional noise insulation barriers and the funding of school trips;
- The on-going improvement of transport infrastructure and services to and from Bristol Airport with an emphasis on reducing the impact of airport traffic in the community and villages surrounding the Airport which may include (but not be limited to) road improvements, public transport initiatives and measures to reduce community severance; and
- Nature conservation, educational projects and sustainability initiatives in the locality of the Airport.

The Fund's area of benefit concentrates on the areas most affected by aircraft operations and comprises the parishes of Winford, Wrington, Backwell, Brockley, Cleeve and Barrow Gurney.

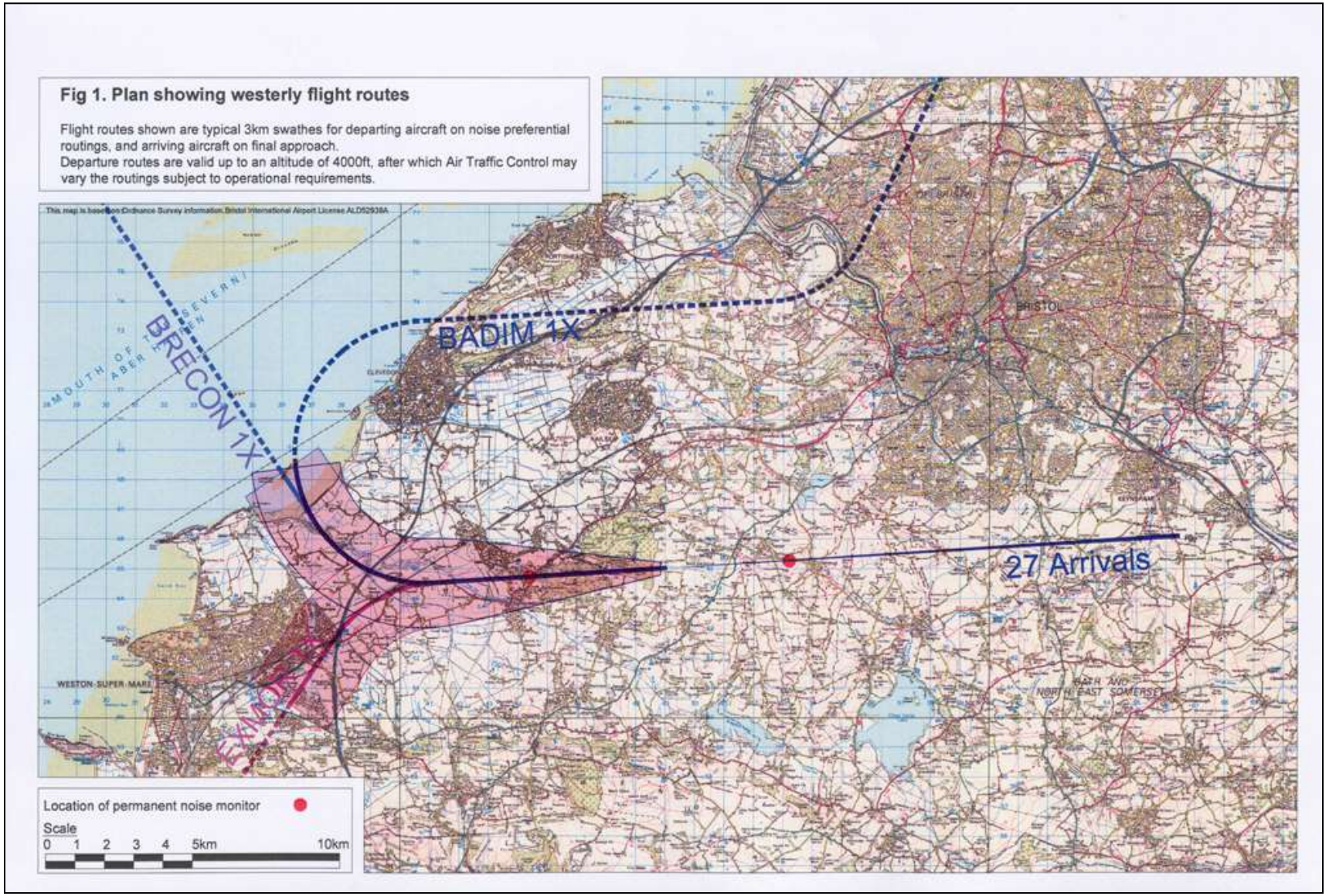
The Local Community Fund has been set up as a Community Interest Company dedicated to the purpose of investment in local community projects. A partnership approach has been taken to the management of the fund which involves community representatives in determining how funds are allocated. Applications for funding are considered four times a year by a Management Committee comprising four representatives from Bristol Airport Limited and four elected members of North Somerset Council. The Management Committee is independently chaired and the Chairman has a casting vote on funding decisions. The Management Committee evaluates each application carefully and uses its local knowledge and expertise to ensure that the fund is used to deliver the greatest possible benefit to the local community.

In 2017, the Fund provided grants totalling over £143,552 (including monies carried over from previous year) to 53 local projects. A list of the organisations and projects that have been supported follows:

Recipient	**Project**
Wrington Fair	Wrington Fair Week
Local residents x 42	Noise insulation grants
Royal West of England Arts Academy	Arts project
West Leigh Infants School	Garden Development
Barley Wood Nursery	Outdoor learning equipment
Backwell WI Hall	Stage and window curtains
Wellspring Counselling	Professional development training
Regil Village Hall	Screen/projector
Felton Village Hall	Projector/Hearing loop system
Wrington Parish Council	Footway and crossing point
Barrow Gurney Parish Council	Village Green
Wrington C of E School	Outdoor learning area

Airport staff raise money for a staff nominated charity of the year. In 2017, over £20,000 was raised by staff and customers for Children's Hospice South West (CHSW). This charity provides hospice care for life-limited children and their families from across the South West of England. Two charity Santa flights were arranged (approximately 300 beneficiaries) working with Thomas Cook Airlines and Eastern Airways. Both airlines provided an aircraft for a one hour scenic flight from Bristol Airport for families from a variety of local charities including British Heart Foundation, Bristol Heart Institute and CHSW to enjoy a Christmas party in the sky and meeting Santa. A further £4,000 was collected for the local Poppy Appeal.

Appendix A – Flight routing maps



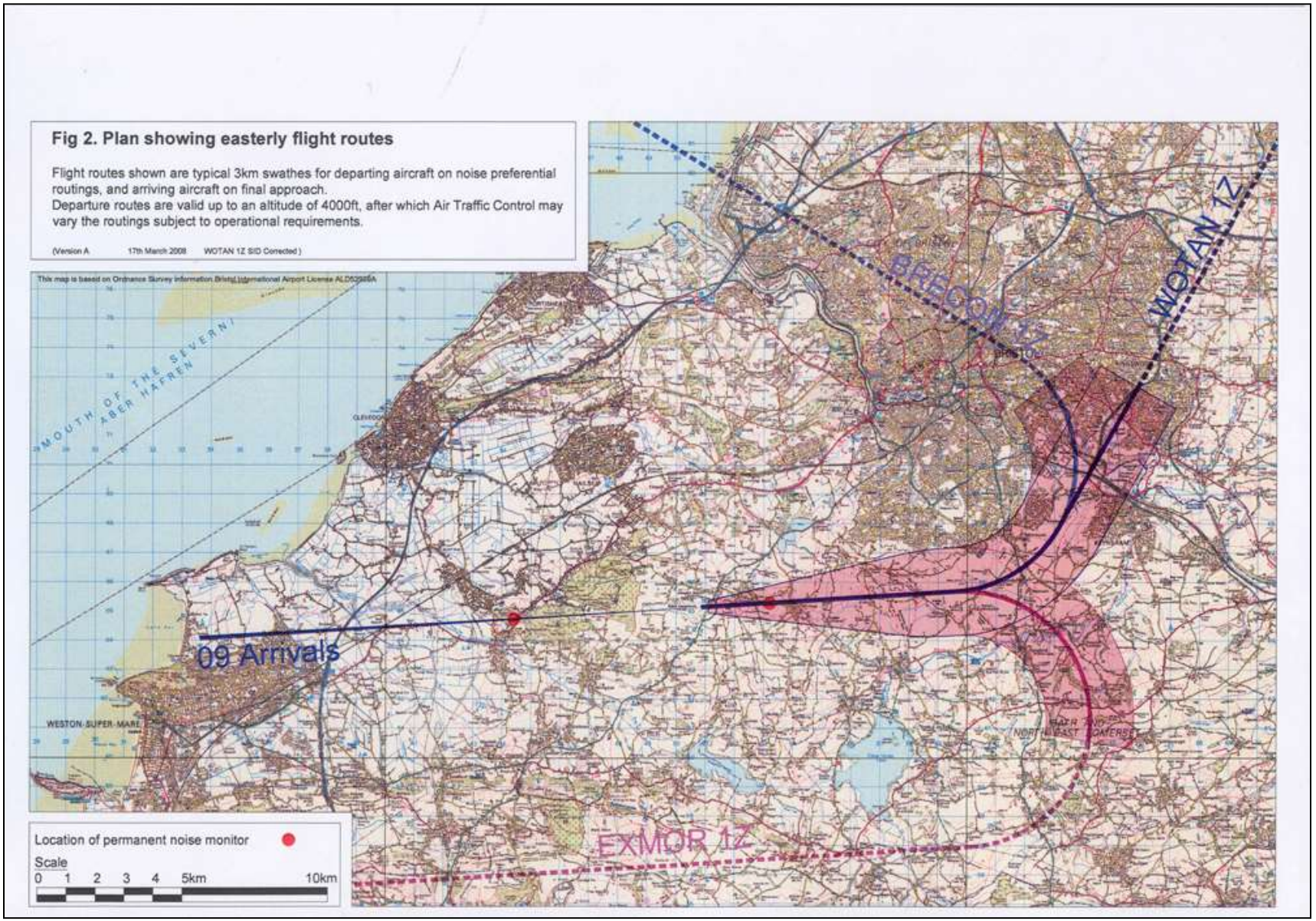
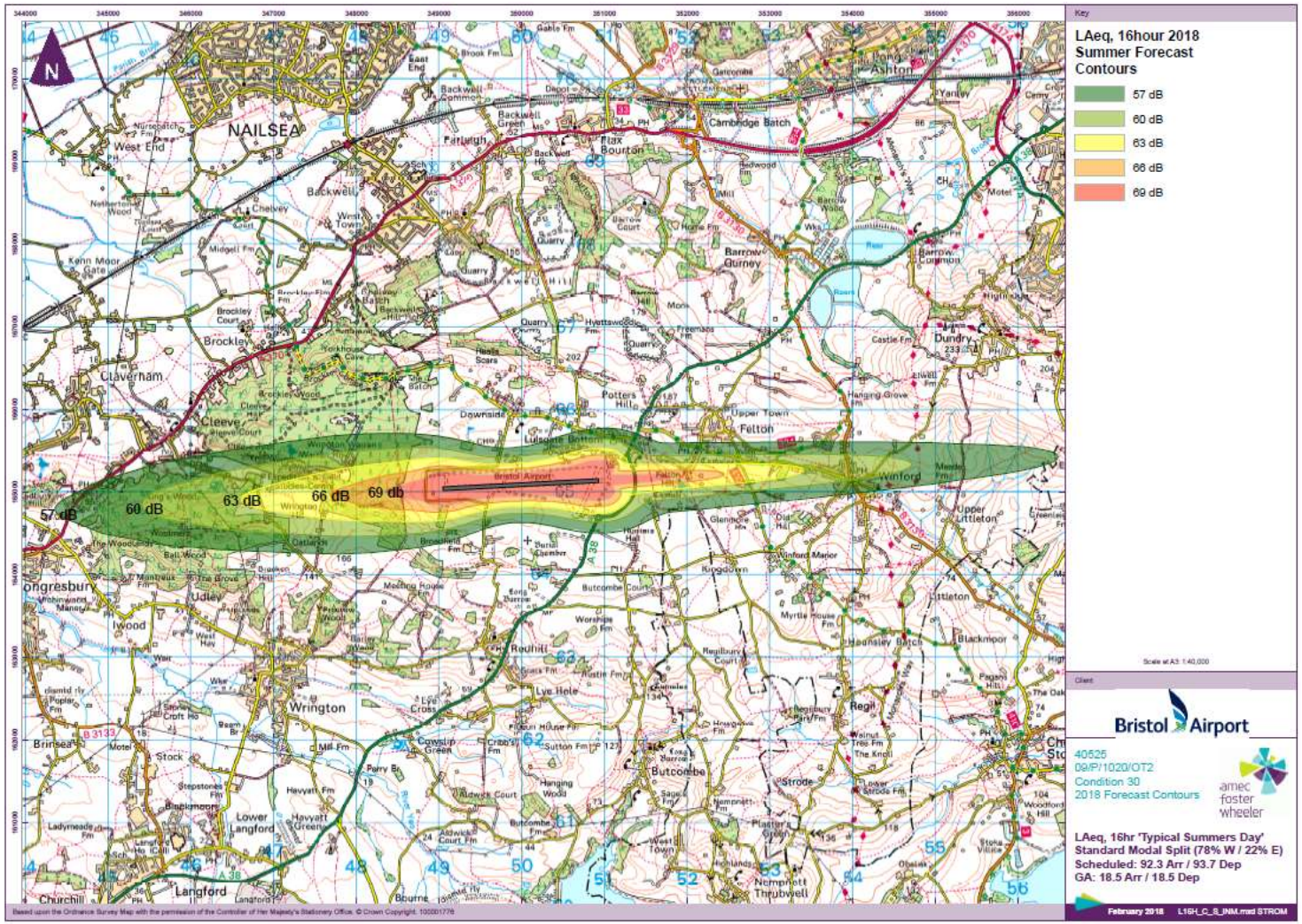


Fig 2. Plan showing easterly flight routes
Flight routes shown are typical 3km swathes for departing aircraft on noise preferential routings, and arriving aircraft on final approach.
Departure routes are valid up to an altitude of 4000ft, after which Air Traffic Control may vary the routings subject to operational requirements.
(Version A 17th March 2008 WOTAN 1Z SID Corrected)
This map is based on Ordnance Survey information Bristol International Airport License ALD52986A
MOUTH OF THE SEVERN / ABER HAFREN
BRECON 1Z
WOTAN 1Z
09 Arrivals
EXMOR 1Z
WESTON-SUPER-MARE
Location of permanent noise monitor
Scale
0 1 2 3 4 5km 10km

Appendix B – Predicted noise contours for summer 2017



Note: contours are at 3dB intervals with an outer contour of 57dB$_{LAeq\ 16hour}$