Night flights over Tunbridge Wells

1. Introduction

Night time aircraft activity over Tunbridge Wells constitutes a frequent reason for complaints, as it does for all communities unfortunate enough to find themselves under Gatwick's flightpaths.

This document shows that more flights per hour occur when most people are trying to get to sleep than during the rest of the day. This apparent rush hour is unacceptable.

2. What defines night time?

The problem begins with the very definition of 'night time'. For most people it lasts for 7½ to 8 hours, for example from 11 pm to 7 am the following morning. A recent well-publicised research article [1] indicated that about two thirds of the population sleep 8 hours or more. Only less than 5% sleep less than 7 hours. And then, of course, there are people whose work patterns force them to sleep during the day.

For Gatwick Airport, meanwhile, and at the expense of its neighbours, 'night time' is defined as 11.30 pm to 6 am, or only 6½ hours. It is critical to profitability.

3. The general picture

In order to place the situation of Tunbridge Wells in a more general context, a CASPER 4-hour daytime screenshot of flight paths crossing the town and landing on Runway 26 is shown in Figure 1 below.

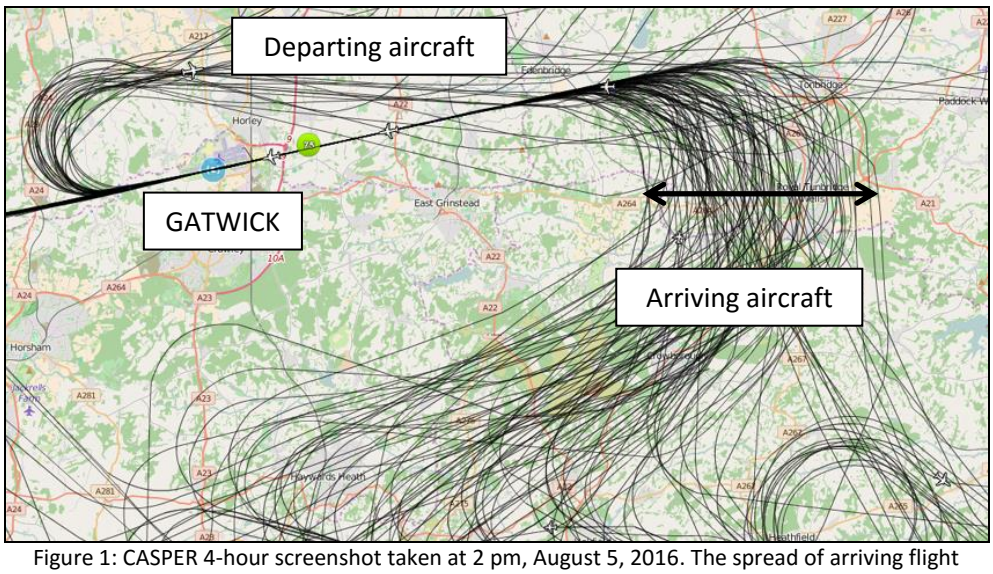

Figure 1: CASPER 4-hour screenshot taken at 2 pm, August 5, 2016. The spread of arriving flight paths approaching Runway 26 and crossing the level of Tunbridge Wells (A264) is shown (black line with arrows).

The black line with arrows shows the east-west spread of the arriving aircraft as they cross Tunbridge Wells headed northwards.

4. Close-up of aircraft activity over Tunbridge Wells

Aircraft headed for Runway 26 cross Tunbridge Wells from the south. The town is some 17 nautical miles (32 km) of flight path from Gatwick's Runway 26 which operates 70% of the time, whenever winds are coming from the west.

Aircraft usually find themselves dispersed within an east-west spread of 8 nm (15 km). In Figure 2 below this spread is displayed in three equal Segments, A, B, and C. The width of each segment (shown in red) is such that about 50% of the noise emanating from an aircraft flying at the centre of the Segment will be heard at its edges. The vertical thickness of the segments corresponds to the average relative aircraft activity since 2013 when flight paths became concentrated over the town.

It can be seen that middle Segment B is the busiest, accounting for an average of 56% of all activity since 2013.

Aircraft altitude in Segment B has averaged 4,727 feet [2].

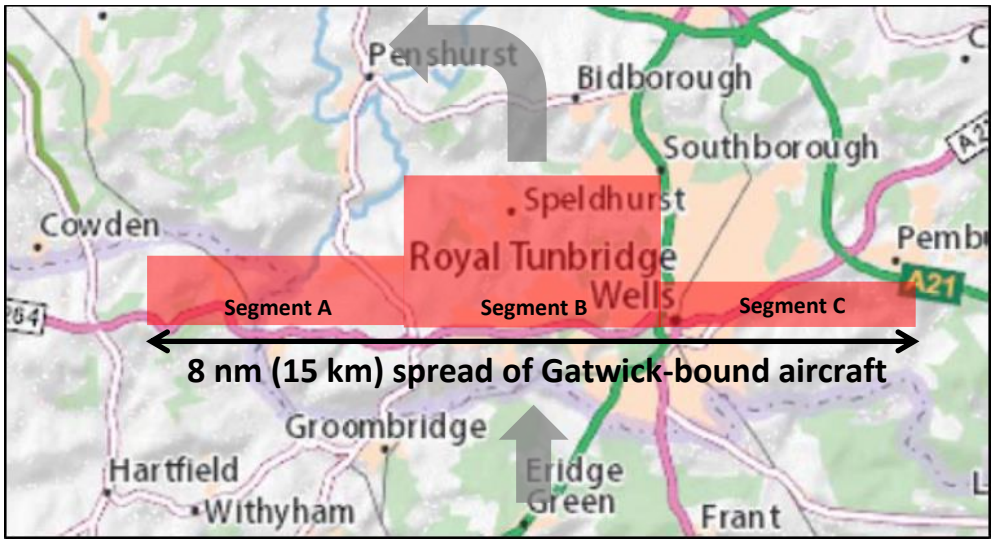

Figure 2: Map of the Tunbridge Wells conurbation showing the 8 nm (15 km) spread of aircraft crossing from the south during 2013-2016 (black line), the historical (since 2013) relative traffic intensity in each segment (red), and the general flying direction (grey).

5. Measuring aircraft activity around the clock

Figure 3 below displays aircraft activity in number of flights per hour throughout a three day period.

Activity is averaged for every four hours, and the blue portion represents flights crossing middle Segment B, the busiest of Segments A, B, and C. Since 2013, as already mentioned, Segment B has been subjected to, on average, 56% of all

flights; Segments A and C (not shown) accounted for 26%, and 18% respectively [2].

It can be seen that from 10 am to 2 am aircraft activity appears relatively constant.

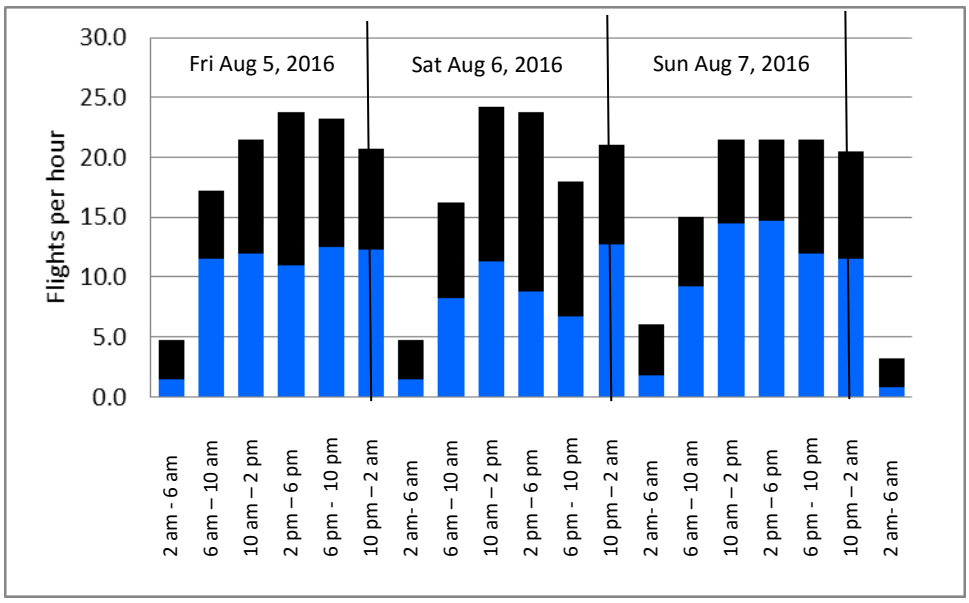

Figure 3: Number of flights per hour crossing the 8 nm (15 km) spread corresponding to the A264 Road (51.125N parallel). The blue portions relate to Segment B only (see Table 1 in Annex).

5. The hidden peak

But 4-hour averages belie a hidden reality related to Gatwick operations; the return of aircraft from their final rotation of the day from various holiday resorts around Europe. This daily event is invariably bunched because of accumulated delays during the day and the reduction in number of aircraft needing to take off. It warrants looking at in more detail.

Already it can be seen from Figure 3 above that aircraft activity occurring between 10 pm and 2 am appears comparable to that during the day. In view of the fact that this is a critical period for people to go to sleep, this time slot was analysed hour by hour.

Figure 4 below shows hour-by-hour variation of flights solely for the time slot 10 pm to 2 am for the same 3 days used for Figure 3.

The results are telling. It can be seen that aircraft activity is noticeably front-loaded to the extent that aircraft activity between 10 pm and midnight is higher than during the day, by up to 10 flights more per hour.

Each aircraft noise event over Tunbridge Wells lasts for about a minute. It constitutes a peak noise level of up to 60-70 decibels [3] or the equivalent of something between conversation in a restaurant and a vacuum cleaner [4].

Independent of the number of peaks occurring per hour, the 10 pm to midnight surge in arrivals means that up to half the time when people are trying to get to sleep aircraft can be heard in the sky.

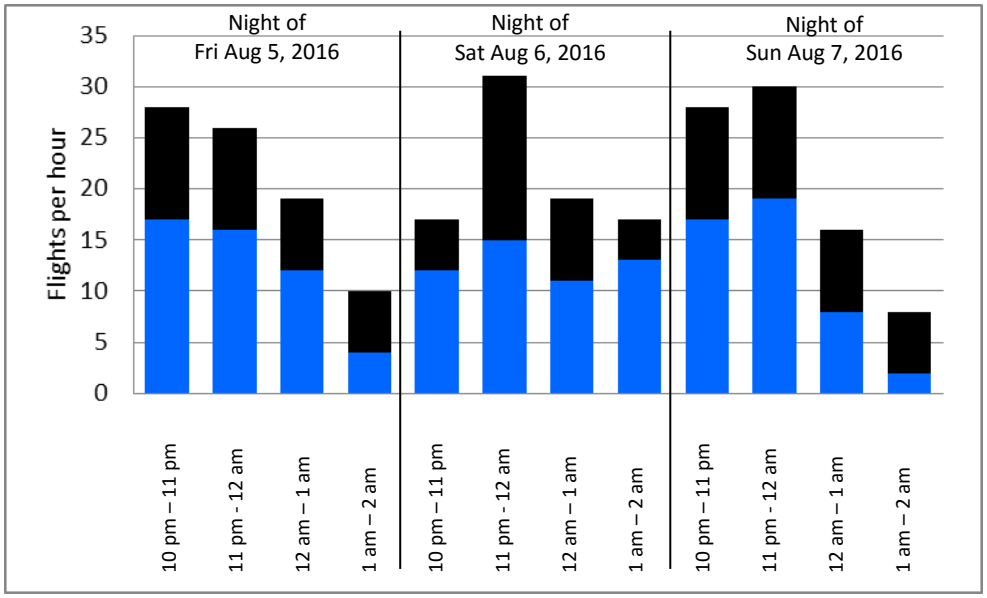

Figure 4: Flights per hour for the slot 10 pm to 2 am only (see Table 2 in Annex).

6. Conclusions

Noisy flights at night are a serious social and health nuisance. They can cause loss and disturbance of sleep which may result in significant health problems and diminish the ability to function productively during the working day and in children, affect their ability to learn.

Gatwick Airport is allowed a certain number of night flights but flights between 10 pm and midnight are clearly too frequent and not in the best interests of the communities beneath.

Either night flights should be banned altogether or substantial measures taken to abate the 10 pm to midnight rush hour.

Annex

		Number of planes				Planes per hour				Percent of all planes		
		SEGMENT A	SEGMENT B	SEGMENT C	TOTAL	SEGMENT A	SEGMENT B	SEGMENT C	TOTAL	SEGMENT A	SEGMENT B	SEGMENT C
	Location	West of B2188	B2188-A26	East of A26								
Jul-15		23	51	13	**87**					26%	59%	15%
May-16		37	58	10	**105**					35%	55%	10%
Jul-16		21	69	34	**124**					17%	56%	27%
5-Aug-16	02:00-06:00	9	6	4	**19**	**2.3**	**1.5**	**1.0**	**4.8**	47%	32%	21%
5-Aug-16	06:00-10:00	12	46	11	**69**	**3.0**	**11.5**	**2.8**	**17.3**	17%	67%	16%
5-Aug-16	10:00-13:45	25	48	13	**86**	**6.3**	**12.0**	**3.3**	**21.5**	29%	56%	15%
5-Aug-16	13:45-18:00	50	44	1	**95**	**12.5**	**11.0**	**0.3**	**23.8**	53%	46%	1%
5-Aug-16	18:00-22:00	39	50	4	**93**	**9.8**	**12.5**	**1.0**	**23.3**	42%	54%	4%
5/6-Aug-16	22:00-02:00	28	49	6	**83**	**7.0**	**12.3**	**1.5**	**20.8**	34%	59%	7%
6-Aug-16	02:00-06:00	10	6	3	**19**	**2.5**	**1.5**	**0.8**	**4.8**	53%	32%	16%
6-Aug-16	06:00-10:00	31	33	1	**65**	**7.8**	**8.3**	**0.3**	**16.3**	48%	51%	2%
6-Aug-16	10:00-14:20	39	45	13	**97**	**9.8**	**11.3**	**3.3**	**24.3**	40%	46%	13%
6-Aug-16	14:20-18.00	58	35	2	**95**	**14.5**	**8.8**	**0.5**	**23.8**	61%	37%	2%
6-Aug-16	18:00-22:00	42	27	3	**72**	**10.5**	**6.8**	**0.8**	**18.0**	58%	38%	4%
6/7-Aug-16	22:00-02:00	22	51	11	**84**	**5.5**	**12.8**	**2.8**	**21.0**	26%	61%	13%
07-08-16	02:00-06:00	12	7	5	**24**	**3.0**	**1.8**	**1.3**	**6.0**	50%	29%	21%
07-08-16	06:00-10:00	15	37	8	**60**	**3.8**	**9.3**	**2.0**	**15.0**	25%	62%	13%
07-08-16	10:00-14:00	4	58	24	**86**	**1.0**	**14.5**	**6.0**	**21.5**	5%	67%	28%
07-08-16	14:00-18:00	4	59	23	**86**	**1.0**	**14.8**	**5.8**	**21.5**	5%	69%	27%
07-08-16	18:00-22:00	21	48	17	**86**	**5.3**	**12.0**	**4.3**	**21.5**	24%	56%	20%
7/8-Aug-16	22:00-02:00	22	46	14	**82**	**5.5**	**11.5**	**3.5**	**20.5**	27%	56%	17%
08-08-16	02:00-06:00	6	3	4	**13**	**1.5**	**0.8**	**1.0**	**3.3**	46%	23%	31%

Table 1: Detailed results from 4-hour screenshots.

		Segment A	Segment B	Segment C	Total
Friday Aug 5, 2016	22:00-23:00	8	17	3	28
	23:00-24:00	10	16	0	26
Saturday Aug 6, 2016	24:00-01:00	4	12	3	19
	01:00-02:00	6	4	0	10
	Subtotal	**28**	**49**	**6**	**83**
	22:00-23:00	5	12	0	17
	23:00-24:00	8	15	8	31
Sunday Aug 7, 2016	24:00-01:00	6	11	2	19
	01:00-02:00	3	13	1	17
	Subtotal	**22**	**51**	**11**	**84**
	22:00-23:00	7	17	4	28
	23:00-24:00	4	19	7	30
Monday Aug 8, 2016	24:00-01:00	6	8	2	16
	01:00-02:00	5	2	1	8
	Subtotal	**22**	**46**	**14**	**82**

Table 2: Detailed results (flights per hour) from 1-hour studies from 22:00 to 02:00.

References:

[1] Olivia J. Walch, Amy Cochran, Daniel B. Forger. *A global quantification of "normal" sleep schedules using smartphone data*. Science Advances 2016, 2.

[2] For data on flight patterns and aircraft behaviour between 2013 and 2016, see *Monitoring the Skies over Tunbridge Wells*. TWAANG, 2016.

[3] Visit http://www.nats.aero/environment/aircraft-noise/representative-aircraft-lmax-data/

[4] Visit http://www.industrialnoisecontrol.com/comparative-noise-examples.htm.