



Is London's Gatwick Airport in the wrong place?

A logistical study by former industrial
efficiency manager, Ed Crutchley

GACC policy

This report contains important new environmental evidence relevant to the debate set by the Government of how to find additional airport capacity in the southeast.

Environmental issues have always been the prime concern for GACC. Nevertheless GACC has always concentrated on reducing the impact of Gatwick. We have steadfastly refused to take the 'NIMBY' route of passing our problems to others. For that reason we have never advocated a new runway at Heathrow, arguing instead the case for no new runway. That case will be set out soon in another research study.

For the past twenty years, like our sister organisation at Heathrow, HACAN, we have been a member of AirportWatch, the association of airport environmental groups: and one of AirportWatch's basic principles is not to play pass-the-parcel, not to argue that some other airport is a better place for expansion.

We need to make it clear therefore that Ed Crutchley's study is a valuable contribution to the current airport debate but should not be seen as representing GACC policy.



Is London's Gatwick Airport in the wrong place?

How to save 144,000 tonnes of CO₂, 7.7 million man-hours, and £112 million in travel costs per year



Introduction

Every year the Civil Aviation Authority (CAA) carries out a passenger survey at each of the UK's main airports.¹ This provides a detailed analysis of where terminating passengers are heading, whether they use public or private transport, and how many are in each group. It helps the government to see whether an airport is well placed to serve its market. For the infrastructure, environment and people's ground travel requirements this is vital: an airport in the wrong place can be very costly indeed.

London

It is claimed that London will soon need a new runway to satisfy anticipated demand and remain internationally competitive.² Since the Greater London area provides the principal customer base for its five local airports, a first consideration has to be the CAA Survey to look at the subtleties. Which of the airports on its four sides is closest to the local geographical centre of its customers and therefore best suited to expansion? Table 1 shows how the five airports compare generally.

	Heathrow	Gatwick	Stansted	Luton	London City
All passengers, '000 (2014)	47,317	35,228	19,096	10,237	3,561
Headed for Greater London, '000	24,926	14,965	10,104	3,605	3,057
Greater London destination, %	52.7	42.5	52.9	35.2	85.8
Airport location in relation to London	West	South	Northeast	Northwest	East
Distance from Southwark, miles	24.6	26.8	38.5	36.5	8.3

Table 1: Comparison of London airport terminating passengers only (2014)³

Focus on Gatwick, London's second airport

Take London's Gatwick Airport for example. It is already challenged by a limited road and rail infrastructure for its size.^{4,5} Situated, as it is, next to an overcrowded motorway that stops short of central London, a congested minor road network, rail services on which passengers have to wait and then too often to stand, is it exactly where it needs to be geographically for any future expansion? The stakes are high: with a new runway, Gatwick would become larger than Heathrow (560,000 aircraft movements per year instead of 480,000).⁶



Why Gatwick is too far south!

Terminating passenger surveys at Gatwick and location of origin/destination

Analysis of the CAA survey⁷ tells us not. Gatwick Airport is too far south. It already lies south of its principal passenger base (central London is almost 30 miles away), but more significantly the number of terminating passengers headed south of Greater London (to East Sussex, Hampshire, Isle of Wight, Kent, Surrey, and West Sussex) is less than a third of the total (11 million out of over 35 million for 2014, for example). This has been the case for over twenty years. In 1991, when the airport was only half as busy, the figure was less than a quarter (4.2 million out of 18.7 million).⁸

Possible savings in ground travel distances for passengers using Heathrow instead of Gatwick

So in an ideal situation, where should Gatwick be located to minimize the ground journeys of its users and thereby protect the environment? The answer is probably somewhere well north of the southern stretch of the M25, definitely not where the airport actually lies.

The CAA Survey provides us with enough information to hypothesize for the other airports, all of which are further north. What if all of Gatwick's customers were to use either Luton, Stansted, London City, or Heathrow instead?

The numbers for the 2014 Survey show that, as seen in Table 2, if the choice were to be Luton or Stansted, there would be extra travel costs for Gatwick passengers. Luton would require 591 million more passenger miles of ground travel, and Stansted almost a billion. For practical reasons there would be no chance of London City Airport ever taking on Gatwick's business, but there would in fact be a gain of 168 million passenger miles of ground travel per year.

	Gatwick terminating passengers 2014	Private transp. %	Public transp. %	Party av. no.	Point of reference	Net miles to LGW return journey	Net miles to LTN return journey	Net miles to STD return journey	Net miles to LCY return journey	
East Midlands	653,000	68.5	31.5	2.2	Nottingham	214,575,800	128,902,200	148,884,000	190,806,600	
East of England	3,025,000	79.1	20.9	2.2	Cambridge	578,985,000	248,050,000	188,155,000	358,160,000	
North East	76,000	31.1	68.9	2.2	Newcastle upon Tyne	48,564,000	38,577,600	38,744,800	43,016,000	
North West	170,000	47.3	52.7	2.2	Preston	86,326,000	65,314,000	76,874,000	81,430,000	
Scotland	80,000	39.0	61.0	2.2	Edinburgh	70,640,000	60,752,000	61,568,000	64,656,000	
S East										
Berkshire	877,000	54.8	44.9	2.2	Reading	110,852,800	98,750,200	147,862,200	117,868,800	
Buckinghamshire	453,000	54.8	44.9	2.2	Aylesbury	68,403,000	27,270,600	57,712,200	57,259,200	
East Sussex	2,162,000	54.8	44.9	2.2	Lewes	136,206,000	434,994,400	432,832,400	346,784,800	
Greater London	14,965,000	54.8	44.9	2.2	Southwark	799,131,000	1,116,389,000	1,161,284,000	284,335,000	
Hampshire	1,848,000	54.8	44.9	2.2	Winchester	258,350,400	306,028,800	409,886,400	346,684,800	
Isle of Wight	101,000	54.8	44.9	2.2	Newport	18,139,600	22,422,000	28,098,200	24,906,600	
Kent	2,505,000	54.8	44.9	2.2	Maidstone	195,891,000	390,279,000	293,085,000	193,386,000	
Oxfordshire	625,000	54.8	44.9	2.2	Oxford	104,500,000	82,625,000	117,625,000	95,875,000	
Surrey	2,443,000	54.8	44.9	2.2	Kingston upon Thames	129,967,600	250,651,800	251,629,000	98,208,600	
West Sussex	2,100,000	54.8	44.9	2.2	Chichester	186,060,000	401,520,000	473,760,000	390,600,000	
South West	1,852,000	74.5	25.5	2.2	Taunton	591,528,800	665,979,200	769,691,200	768,209,600	
Wales	481,000	61.7	38.3	2.2	Llandrindod Wells	209,235,000	162,770,400	195,478,400	213,467,800	
West Midlands	511,000	66.1	33.9	2.2	Birmingham	154,219,800	91,060,200	125,808,200	139,503,000	
Yorkshire and the Humber	301,000	51.4	48.6	2.2	York	148,092,000	108,540,600	109,202,800	126,119,000	
TOTAL	35,228,000					4,109,667,800	4,700,877,000	5,088,180,800	3,941,276,800	
Gain in ground travel in relation to Gatwick								-591,209,200	-978,513,000	168,391,000

Table 2: Comparison of net passenger ground travel distances for Gatwick customers for four London airports in 2014 (LGW, LTN, STD, and LCY).

However, the results for Heathrow are even better than for London City. Table 3 shows that if Gatwick Airport, at its 2014 capacity, were to be situated at Heathrow, 552 million passenger miles of ground travel would be saved every year.

	Gatwick terminating passengers 2014	Private transp. %	Public transp. %	Party av. no.	Point of reference	Miles to LGW single journey	Miles to LHR single journey	Net miles to LGW return journey	Net miles to LHR return journey	Gatwick excess return journey over Heathrow, miles	Excess private transport car miles	Excess public transport rail miles
East Midlands	653,000	68.5	31.5	2.2	Nottingham	164.3	127.4	214,575,800	166,384,400	48,191,400	15,005,050	15,180,291
East of England	3,025,000	79.1	20.9	2.2	Cambridge	95.7	70.5	578,985,000	426,525,000	152,460,000	54,816,300	31,864,140
North East	76,000	31.1	68.9	2.2	Newcastle upon Tyne	319.5	282.5	48,564,000	42,940,000	5,624,000	795,029	3,874,936
North West	170,000	47.3	52.7	2.2	Preston	253.9	217.1	86,326,000	73,814,000	12,512,000	2,690,080	6,593,824
Scotland	80,000	39.0	61.0	2.2	Edinburgh	441.5	404.7	70,640,000	64,752,000	5,888,000	1,043,782	3,591,680
S East												
Berkshire	877,000	54.8	44.9	2.2	Reading	63.2	26.4	110,852,800	46,305,600	64,547,200	16,078,121	28,981,693
Buckinghamshire	453,000	54.8	44.9	2.2	Aylesbury	75.5	38.7	68,403,000	35,062,200	33,340,800	8,304,890	14,970,019
East Sussex	2,162,000	54.8	44.9	2.2	Lewes	31.5	67.7	136,206,000	292,734,800	-156,528,800	-38,989,901	-70,281,431
Greater London	14,965,000	54.8	44.9	2.2	Southwark	26.7	19.0	799,131,000	568,670,000	230,461,000	57,405,740	103,476,989
Hampshire	1,848,000	54.8	44.9	2.2	Winchester	69.9	49.9	258,350,400	184,430,400	73,920,000	18,412,800	33,190,080
Isle of Wight	101,000	54.8	44.9	2.2	Newport	89.8	78.1	18,139,600	15,776,200	2,363,400	588,701	1,061,167
Kent	2,505,000	54.8	44.9	2.2	Maidstone	39.1	60.5	195,891,000	303,105,000	-107,214,000	-26,706,033	-48,139,086
Oxfordshire	625,000	54.8	44.9	2.2	Oxford	83.6	46.8	104,500,000	58,500,000	46,000,000	11,458,182	20,654,000
Surrey	2,443,000	54.8	44.9	2.2	Kingston upon Thames	26.6	8.9	129,967,600	43,485,400	86,482,200	21,541,930	38,830,508
West Sussex	2,100,000	54.8	44.9	2.2	Chichester	44.3	62.7	186,060,000	263,340,000	-77,280,000	-19,249,745	-34,698,720
South West	1,852,000	74.5	25.5	2.2	Taunton	159.7	149.9	591,528,800	555,229,600	36,299,200	12,292,229	9,256,296
Wales	481,000	61.7	38.3	2.2	Llandrindod Wells	217.5	180.7	209,235,000	173,833,400	35,401,600	9,928,540	13,558,813
West Midlands	511,000	66.1	33.9	2.2	Birmingham	150.9	114.1	154,219,800	116,610,200	37,609,600	11,299,975	12,749,654
Yorkshire and the Humber	301,000	51.4	48.6	2.2	York	246.0	209.0	148,092,000	125,818,000	22,274,000	5,204,016	10,825,164
TOTAL	35,228,000							4,109,667,800	3,557,316,200	552,351,600	161,919,686	195,540,016

Table 3: Comparison of Gatwick and Heathrow ground travel for Gatwick passengers in 2014.

Cost savings in ground travel for passengers using Heathrow instead of Gatwick

Were Gatwick passengers to use Heathrow instead, Table 4 shows that the direct travel cost saving to road and rail passengers would be in the order of £112 million, or £3.18 for each passenger.

Transport	Miles saved	Assumed cost per mile	Total saving, £
Car	161,919,686	£0.45	72,863,856
Rail	195,540,016	£0.20	39,108,002
Total saving			111,971,858
Per passenger	(35,228,000)		3.18

Table 4: Yearly passenger ground transport savings, Gatwick customers using Heathrow.



Time savings in ground travel for passengers using Heathrow instead of Gatwick

Table 5 shows that on average passengers would each also save the equivalent of 16 miles of return ground travel by using Heathrow instead of Gatwick. At an average speed of 50 mph, total savings would be 7.7 million man-hours per year, equivalent to nearly 4,600 full-time workers.⁹

Passengers	Miles saved	Miles saved per passenger	Assumed speed mph	Man-hours saved per year
35,228,000	552,351,600	15.7	50	7,671,550

Table 5: Distance and time saved in passenger ground transport, Gatwick customers using Heathrow.



Carbon emissions savings by passengers using Heathrow instead of Gatwick

Another part of the story concerns global warming. If we accept the average CO₂ emissions for road and rail travel reasoned by Mike Berners-Lee in his famous 2010 book *How Bad are Bananas?*¹⁰ the ground travel savings through locating Gatwick at Heathrow would be in the order of 144,000 tonnes of CO₂ per year (see Table 6). According to Berners-Lee, that is the equivalent of 288 hectares of deforestation, representing almost 40% of the land presently occupied by the airport.

Transport	Miles saved	CO ₂ /mile (Kg) [10]	Total emissions (Tonnes)
Car	161,919,686	0.71	114,963
Rail	195,540,016	0.15	29,331
Total			144,294

Table 6: Annual ground travel CO₂ emissions saved by Gatwick passengers using Heathrow.

Heathrow airport versus Gatwick

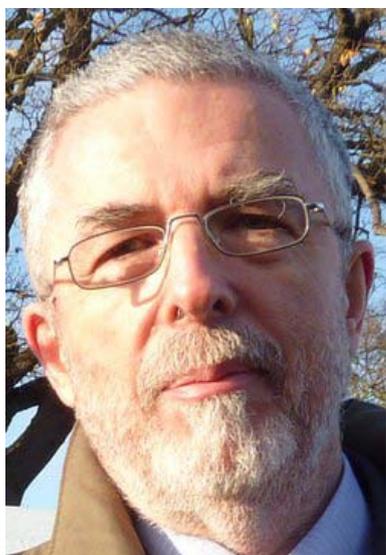
Similar comparisons for Heathrow, presently the competing candidate for a new southeast runway, showed that this airport is much better placed for its own passenger base in relation to other existing London airports. The Airports Commission 2015 Final Report adds predictions that, by the year 2030, Heathrow Airport would have a catchment area population of 700,000 within a 30 minutes reach, and 38 million within 3 hours, whereas the corresponding numbers for Gatwick Airport would only be 570,000 and 34 million.¹¹

Conclusions

The numbers are worth taking into consideration. Of course, Gatwick is never going to relocate to Heathrow. But analysis of CAA passenger surveys tells us quite clearly where any future expansion of capacity in the southeast should be preferred if existing airports are to be considered. And the calculation does not even take into account the extra mileage when non-travelling accompanying parties drive to or from the airport, well-publicised health issues related to toxic NO₂ and particulate emissions from all the excess road transport, or for that matter implications resulting from future evolution in freight traffic to and from an expanded Gatwick. On these combined grounds, all of London and its surrounding regions would stand to benefit.



The Author



Ed Crutchley

Ed Crutchley lives in Tunbridge Wells and is a member of TWAANG (Tunbridge Wells Anti Aircraft Noise Group). He is a retired industrial efficiency manager, sometime author and inventor, and has lived extensively in France and the USA.

References

- ¹ Visit <https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Consumer-research/>
- ² Airports Commission: Final Report. Airports Commission, July 2015.
- ³ CAA Passenger Survey Report 2014. Tables 4.3a, 6.4, 6.5, 6.8, 6.11. CAA. www.caa.co.uk.
- ⁴ Road Traffic Implications of a second runway at Gatwick Airport. GACC Research Paper, 2016.
- ⁵ Gatwick Airport rail services and infrastructure development. Jonathan Tyler. GACC Research Paper, 2016.
- ⁶ Airports Commission: Final Report. Page 163. Airports Commission, July 2015.
- ⁷ CAA Passenger Survey Report 2014. Tables 4.3a, 5.4, 9.4, 11.4. CAA. www.caa.co.uk.
- ⁸ CAA CAP 610: Passengers at London Airports in 1991. Pages 56-58. CAA. www.caa.co.uk.
- ⁹ Working time. https://en.wikipedia.org/wiki/Working_time retrieved July 31, 2016. The UK lies 25th in ranking, with 1,677 hours per year.
- ¹⁰ How Bad are Bananas? Mike Berners-Lee. Profile Books. London 2010. See pages 40 (rail travel), 65 (cars), and 154 (deforestation).
- ¹¹ Airports Commission: Final Report. Page 162. Airports Commission, July 2015.

