



4% climb profile measurement and performance

April 17

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Heathrow
Making every journey better

Content

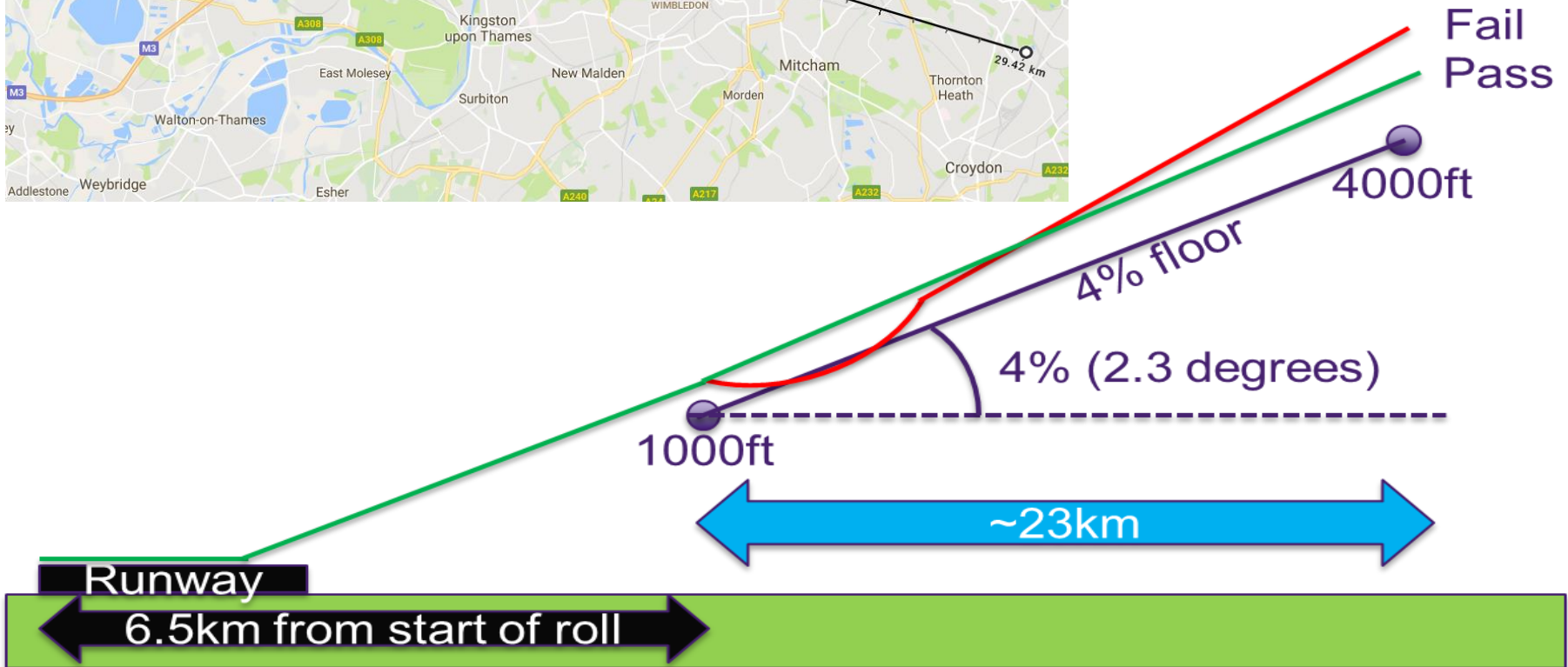
1. AIP – what it says
2. How we're measuring it
3. Results so far
4. Engagement

AIP requirement (Aeronautical Information Publication)

- It shall be the duty of every person who is the operator of any aircraft which is to take off or land at Heathrow Airport – London to secure that, after the aircraft takes off or, as the case may be, before it lands at the aerodrome the following requirements are complied with:
 - 1) After take-off the aircraft shall be operated in such a way that it is at a height of not less than **1000 ft above airport level at 6.5 km from start of roll** as measured along the departure track of that aircraft.
 - 7) Where the aircraft is a jet aircraft, after passing the point referred to in sub-paragraph (1) above, it shall maintain a gradient of climb of not less than **4% to an altitude of not less than 4000 ft**. The aircraft shall be operated in such a way that progressively reducing noise levels at points on the ground under the flight path.

Graphic of departure climb profile requirements

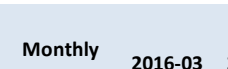
First test- above 1000ft at 6.5km
Second test- climb at 4% to 4000ft



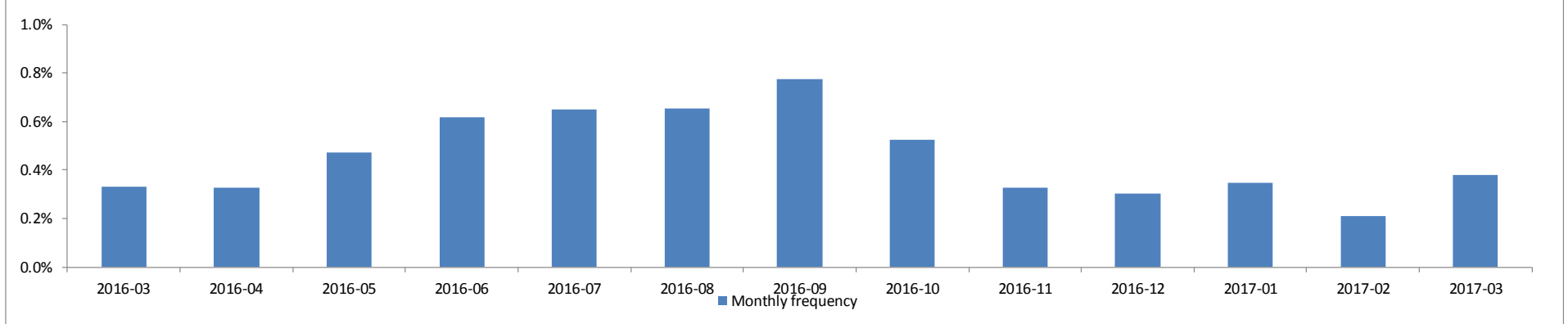
4% performance over past 13 months

Overall performance at 0.5% infringement, 99.5% compliance


LHR 4% overall performance, all departures (excluding 09R CPT)

Airline	Monthly Profile	2016-03	2016-04	2016-05	2016-06	2016-07	2016-08	2016-09	2016-10	2016-11	2016-12	2017-01	2017-02	2017-03	Count of failures over 13 months	Total Movements	Overall frequency
Monthly frequency		0.3%	0.3%	0.5%	0.6%	0.6%	0.7%	0.8%	0.5%	0.3%	0.3%	0.3%	0.2%	0.4%	1,134	244682	0.5%

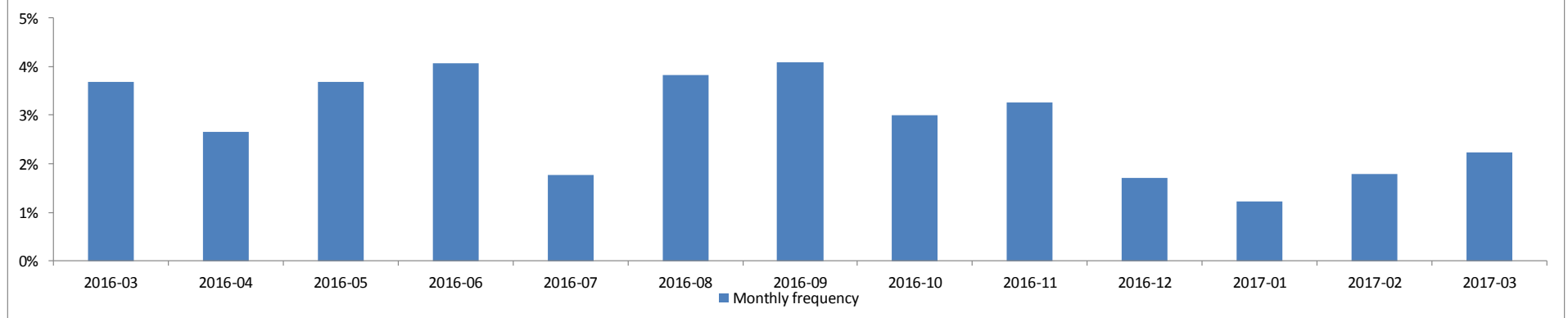
Monthly frequency, all except 09R Compton



LHR 4% overall performance, all depures (09R CPT only)

Airline	Monthly Profile	2016-03	2016-04	2016-05	2016-06	2016-07	2016-08	2016-09	2016-10	2016-11	2016-12	2017-01	2017-02	2017-03	Count of failures over 13 months	Total Movements	Overall frequency
Monthly frequency		3.7%	2.7%	3.7%	4.1%	1.8%	3.8%	4.1%	3.0%	3.3%	1.7%	1.2%	1.8%	2.2%	417	13830	3.0%

Monthly frequency 09R Compton



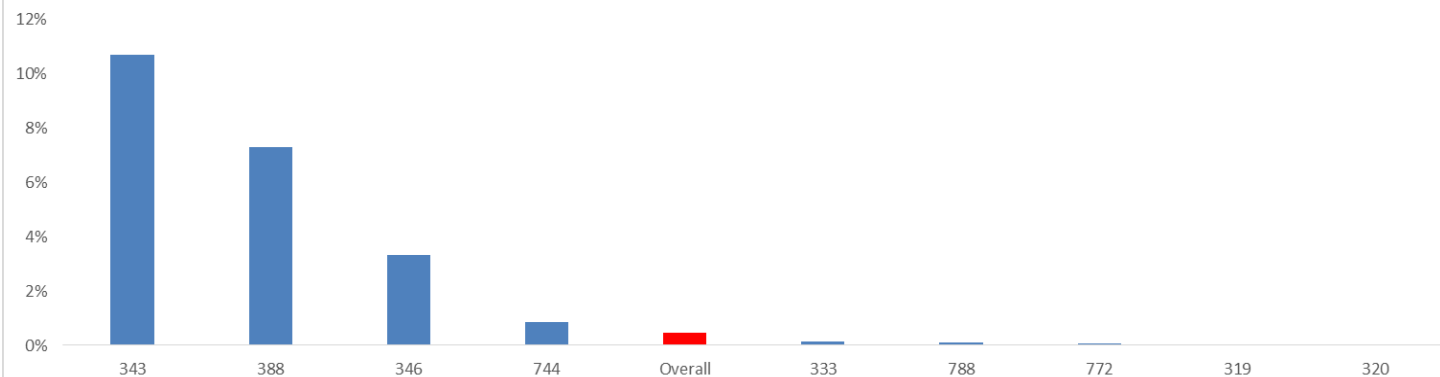
Example table: What aircraft types are failing

Ranked table for all departures over past year

LHR 4% overall performance, all departures (excluding 09R CPT)

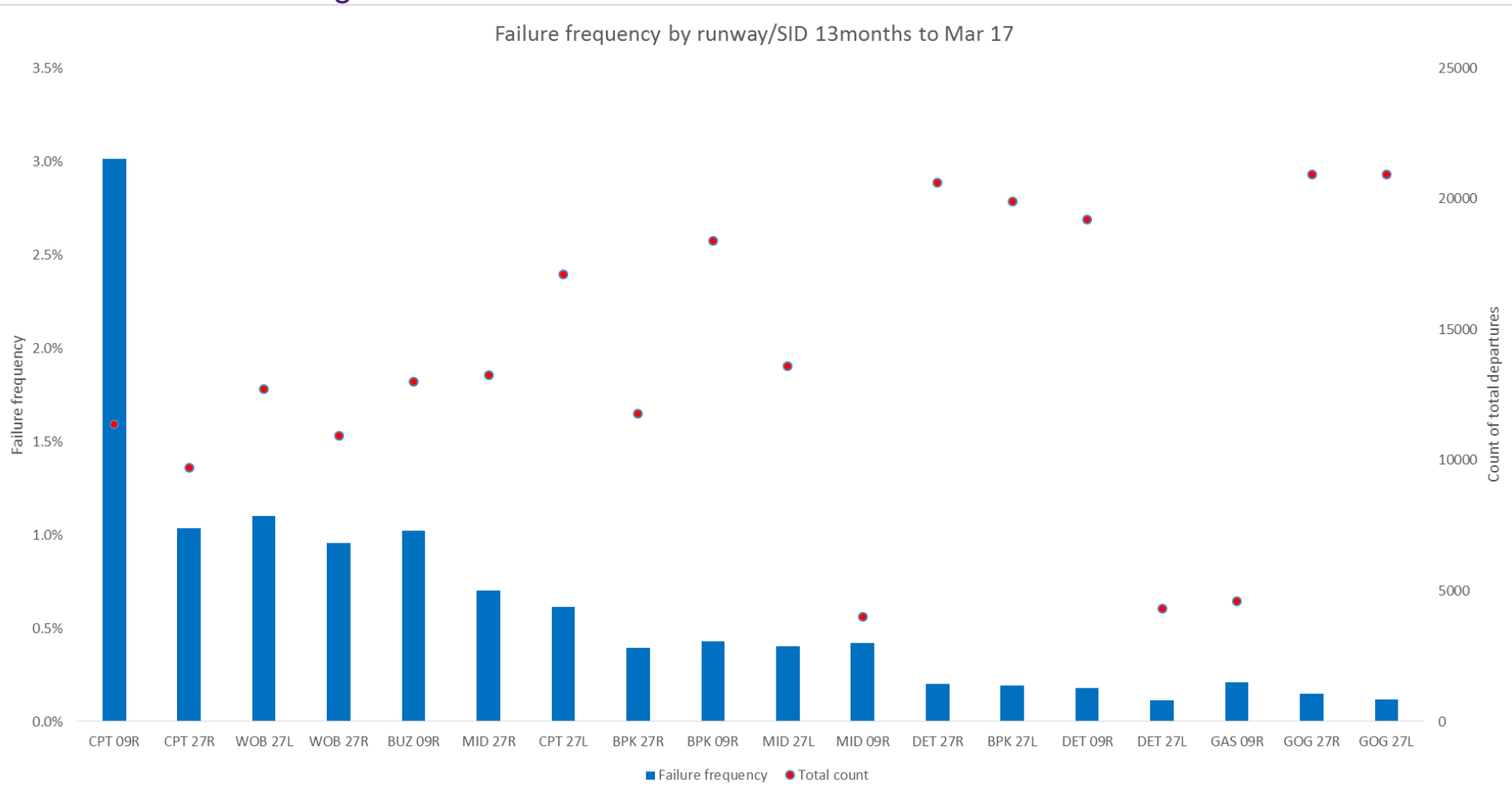
Airline	Monthly Profile	2016-03	2016-04	2016-05	2016-06	2016-07	2016-08	2016-09	2016-10	2016-11	2016-12	2017-01	2017-02	2017-03	Count of failures over 13 months	Total Movements	Overall frequency
388		5.0%	5.6%	8.4%	9.9%	9.4%	10.3%	10.9%	7.2%	5.8%	4.0%	5.9%	4.0%	6.2%	793	10840	7.3%
343		12.7%	8.0%	5.6%	10.4%	10.7%	8.9%	18.2%	12.3%	11.5%	11.7%	5.1%	3.2%	13.2%	135	1260	10.7%
744		0.4%	0.3%	1.3%	1.2%	1.1%	1.0%	2.0%	1.0%	0.2%	0.8%	0.3%	0.2%	0.7%	76	8977	0.8%
346		1.9%	1.8%	3.9%	4.9%	3.2%	5.0%	5.3%	7.6%	1.7%	1.3%	0.9%	1.0%	3.3%	72	2162	3.3%
772		0.1%	0.1%	0.1%	0.0%	0.0%	0.1%	0.2%	0.2%	0.0%	0.0%	0.2%	0.1%	0.1%	12	13832	0.1%
320		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7	59621	0.0%
788		0.0%	0.2%	0.0%	0.0%	0.0%	0.2%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	7	7124	0.1%
333		0.3%	0.0%	0.0%	0.0%	0.2%	0.0%	0.2%	0.5%	0.0%	0.2%	0.2%	0.0%	0.0%	7	5293	0.1%
319		0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7	43455	0.0%
789		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%	2	7328	0.0%
73H		0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2	3211	0.1%
32A		0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	2	13940	0.0%
321		0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2	21424	0.0%
342		0.0%	-	0.0%	-	-	0.0%	-	-	-	-	0.0%	-	-	1	6	16.7%
332		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	1	3597	0.0%
77W		0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1	15419	0.0%
74N		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	1	73	1.4%
E90		0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1	776	0.1%
76W		0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1	3798	0.0%
DF9		0.0%	-	-	-	50.0%	-	0.0%	-	0.0%	-	-	-	0.0%	1	6	16.7%
DF7		0.0%	-	0.0%	50.0%	-	-	-	-	-	-	-	-	0.0%	1	5	20.0%
734		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	1	769	0.1%
ER3		-	0.0%	-	0.0%	50.0%	-	0.0%	-	0.0%	-	-	-	-	1	7	14.3%

Infringement frequency, >2 violations over past 13 months



Infringement by route

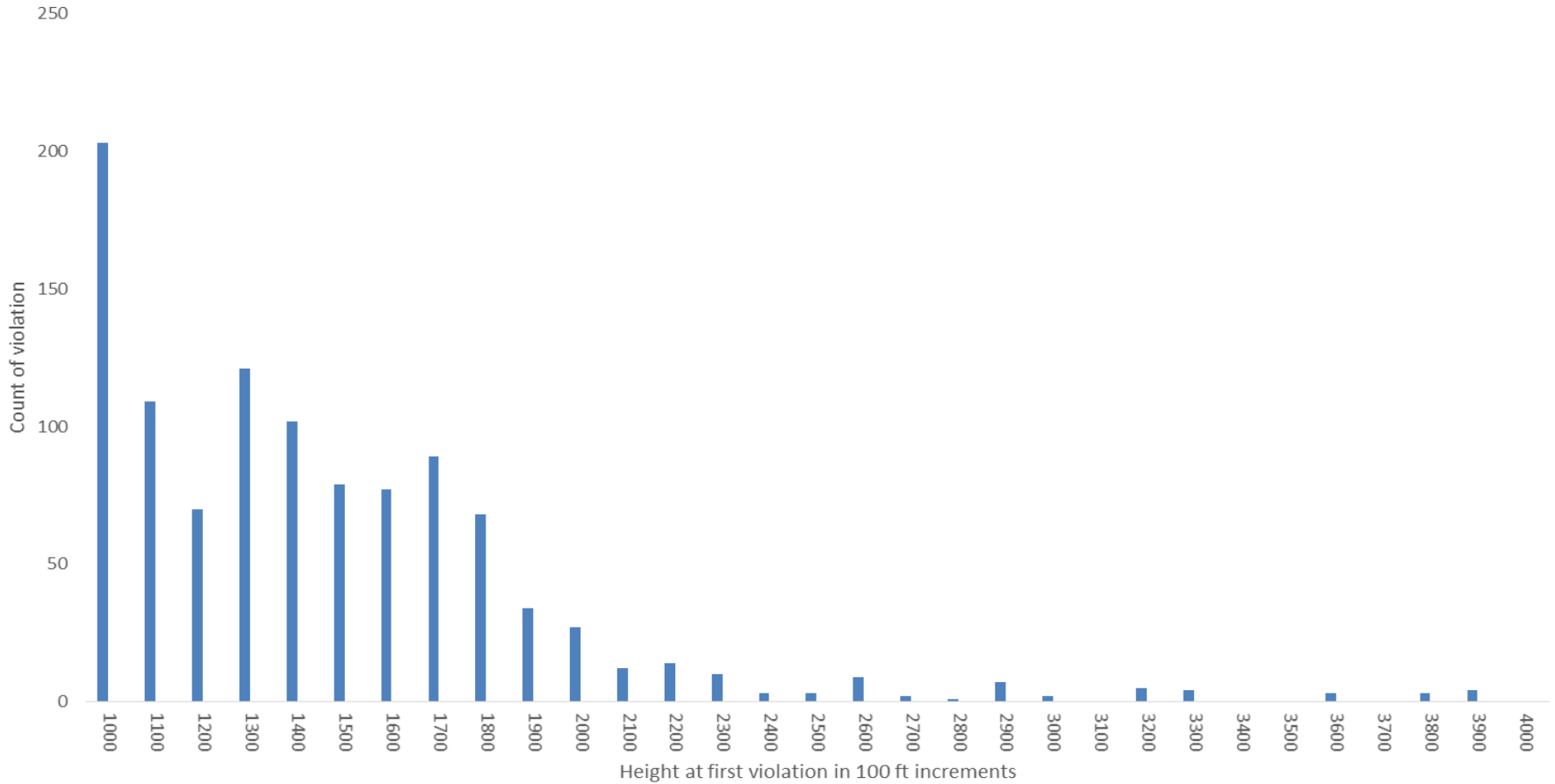
The route flown is not the primary reason for failure (except 09R CPT), and relates to the mix of aircraft using the route



Example table: Where aircraft are failing

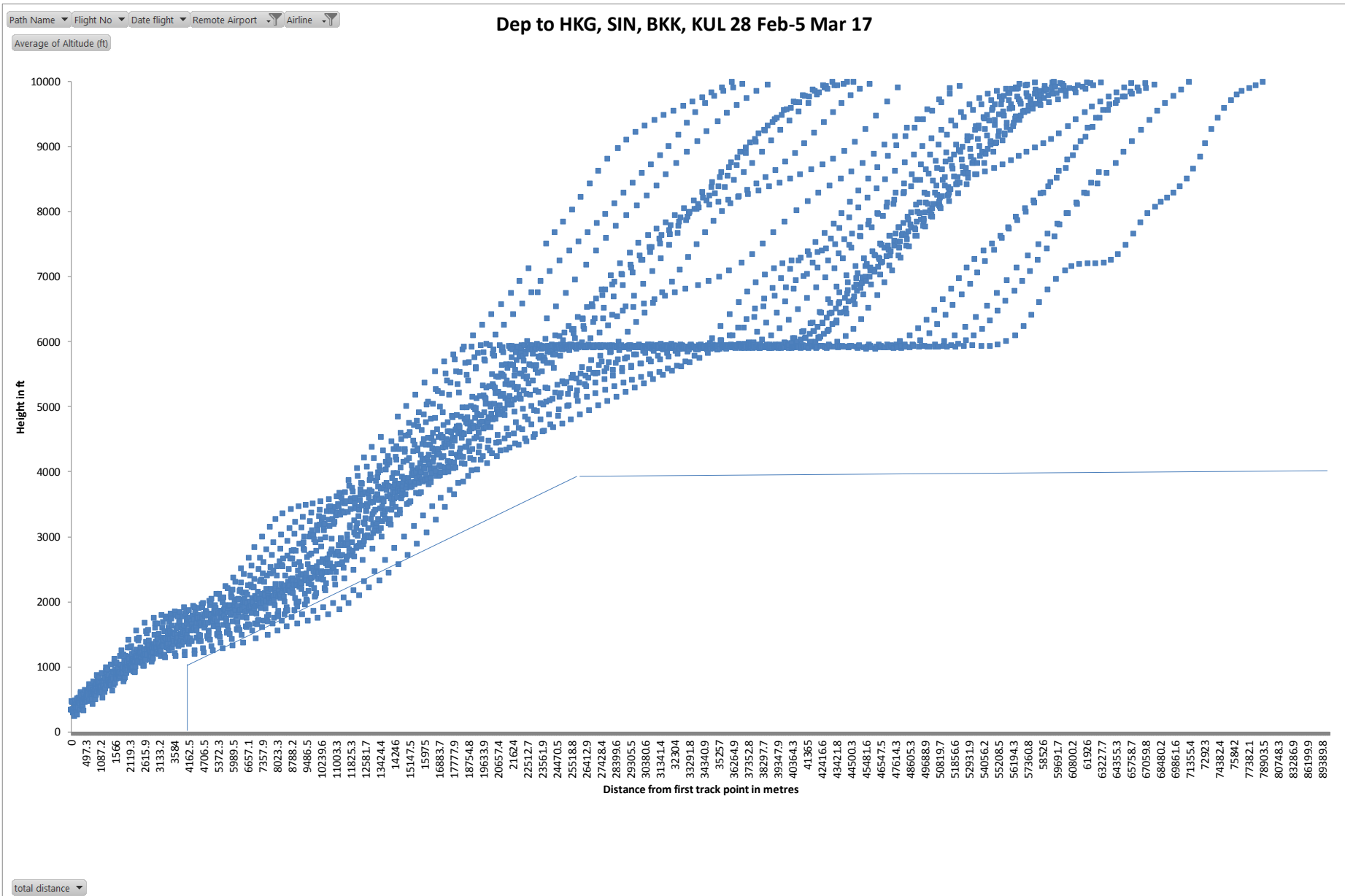
table looks at the first point an aircraft fall below the 4% floor

All LHR infringements Mar 16-Mar17
First violation point rounded to 100ft, (09R CPT excluded)



Example of climb gradients

Ultra long haul A380



Next steps

- We have begun conversations with the following main operators of those not meeting the 4%:
 - British Airways
 - Virgin Atlantic
 - Singapore
 - Mauritius
 - Philippines
 - Thai
 - South African
- We will now continue to monitor and share best practice with the airlines.