

## Annex 2 – Critical loss analysis

### Approach and assumptions

- 1.1 The critical loss analysis examines the level of passenger demand reduction and aircraft withdrawal that would be required for an airport charge increase to be unprofitable for the airport operator. The analysis considers a small but significant non-inflationary increase in prices of 5 per cent and 10 per cent (the SSNIP test). The analysis examines the impact of a change in aeronautical charges. The analysis does not examine a change in overall revenues as the CAA has not yet analysed in detail whether Stansted Airport Limited (STAL) has substantial market power in relation to its commercial revenue.
- 1.2 The analysis uses regulatory accounts information for 2011/12 and takes into account the impact of a change in charges on operating costs and commercial revenues. The analysis makes the following assumptions:
- Operating cost elasticity of demand of 0.5 based on analysis undertaken by Steer Davies Gleave (SDG) as part of the Stansted airport (Stansted) mid Q review.<sup>1</sup> An alternative elasticity of 0.3 has been used based on work undertaken by the Competition Commission (CC) as part of the STAL Q5 review.<sup>2</sup>
  - Non aeronautical revenue variability has been assumed to be in line with the assumptions in the STAL baseline business plan (see Table 1). For the purposes of this analysis aeronautical revenue from non passenger aircraft is included with non aeronautical revenue as non passenger traffic is assumed not to vary with passenger traffic.

**Table 1: Non aeronautical revenue variability assumptions**

Non aeronautical revenue category	2011/12 revenue (£m)	Proportion variable	Variable revenues (£m)
<b>Other traffic related</b>	0.5	0%	0
<b>Retail</b>	74.8	100%	74.8
<b>Property</b>	14.2	0%	0
<b>Other</b>	10.9	50%	5.45
<b>Non passenger traffic</b>	7.9	0%	0
<b>Total</b>	<b>108.3</b>	<b>74%</b>	<b>80.25</b>

Source: STAL [redacted] and CAA analysis

<sup>1</sup> SDG, Stansted airport: Review of operating expenditure and investment consultation (Annex D): Mid term Q5, May 2012, p. 57. This document can be accessed at: <http://www.caa.co.uk/docs/5/SDGStanstedReport.pdf>. The elasticity is quoted as 0.44 but increases to 0.5 in periods with declining traffic. As an increase in charges is likely to lead to a decline in traffic the elasticity of 0.5 has been used

<sup>2</sup> CC, Annex 5 of Appendix H, Stansted Airport Ltd: Q5 price control review. This document can be accessed at [http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep\\_pub/reports/2008/fulltext/539ah.pdf](http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2008/fulltext/539ah.pdf)

## Impact on passengers

- 1.3 Table 2 shows the critical loss analysis. The analysis shows that a 5 to 10 per cent increase in aeronautical charges will increase aeronautical revenue from an average of £6.71 per passenger to £7.04/£7.38 per passenger. This gives an overall aeronautical revenue increase of £6/£12m (assuming no change in passenger numbers). Based on this and taking into account the potential reduction in operating costs and loss of non aeronautical revenue from lower passenger numbers, gives a critical loss of passengers of 0.7 to 0.8m, for a 5 per cent change in charges, and 1.3 to 1.5m for a 10 per cent change in charges (the range reflects different assumptions on operating expenditure elasticities). This is the reduction in passengers required for the aeronautical charge increase to be unprofitable for the airport operator.

**Table 2: Critical loss in terms of passengers**

SSNIP increment	Increase in aeronautical revenue	
	5%	10%
<b><u>Background data</u></b>		
Passengers (mppa)	17.847	17.847
Aeronautical Revenue	119.7	119.7
Non Aeronautical Revenue	108.3	108.3
Total Revenue	228.0	228.0
Operating Costs	141.7	141.7
Aeronautical Revenue per Passenger (£ per pax)	6.71	6.71
Non Aeronautical Revenue per Passenger (£ per pax)	6.07	6.07
Variability of non aero revenue	74%	74%
Total Revenue per Passenger (£ per pax)	12.78	12.78
Operating Costs per Passenger (£ per pax)	7.94	7.94
<b><u>After price increase</u></b>		
Aeronautical Revenue per Passenger (£ per pax)	7.04	7.38
Non Aeronautical Revenue per Passenger (£ per pax)	6.07	6.07
Total Revenue per Passenger (£ per pax)	13.11	13.45
Increase in Revenue (£m)	5.99	11.97
<b>Critical loss (mppa) (SDG opex elasticity)</b>	<b>0.791</b>	<b>1.514</b>
<b>Critical loss (mppa) (CC opex elasticity)</b>	<b>0.654</b>	<b>1.261</b>

Source: Stansted regulatory accounts 2011/12 and CAA calculations

- 1.4 Table 3 shows the implied elasticity from the change in passenger numbers. The reduction in passengers implies that if the airport charge elasticity is above 0.7 to 0.9 then the airport operator cannot profitably increase charges. As shown in Annex 3 we consider the likely range for the opex elasticity is 0.2 to 0.6. This implies that, all other things being equal, the airport operator can profitably increase airport charges to passengers.

**Table 3: Implied passenger demand elasticity**

SSNIP increment	Increase in aeronautical revenue	
	5%	10%
Critical loss (mppa) (SDG opex elasticity)	0.791	1.514
Critical loss (mppa) (CC opex elasticity)	0.654	1.261
Change in passengers SDG	4.4%	8.5%
Change in passengers CC	3.7%	7.1%
Implied elasticity SDG opex elasticity	0.9	0.9
Implied elasticity CC opex elasticity	0.7	0.7

Source: Stansted regulatory accounts 2011/12 and CAA calculations

### Implied aircraft withdrawal requirements

- 1.5 A further way of considering the critical loss is to examine the number of aircraft that would need to be withdrawn for an airport charge increase to be unprofitable. This has been considered separately with Ryanair and easyJet aircraft assumptions.

*Based on Ryanair aircraft assumptions*

- 1.6 Ryanair accounts for 68% of passengers at Stansted.<sup>3</sup> Ryanair's fleet is made up entirely of Boeing 737-800, with 189 seats.<sup>4</sup> The average load factor is 82 per cent<sup>5</sup> which gives an average of 155 passengers per aircraft. The CAA analysis, shown in Table 4, implies the withdrawal of 2 to 4 based aircraft (year round) would be sufficient to offset the increase in airport charges. Cross checking this against an average of 300,000 passengers per based aircraft year<sup>6</sup>, gives a slightly higher level of aircraft withdrawal, as shown in Table 5.

<sup>3</sup> CAA, Passenger survey data (2011)

<sup>4</sup> Ryanair, <http://www.ryanair.com/en/about/fleet>, accessed 10 December 2012

<sup>5</sup> Ryanair, <http://www.ryanair.com/en/investor/traffic-figures>, accessed 10 December 2012

<sup>6</sup> Correspondence with Ryanair, based on 3 rotations per based aircraft. The RBB report (page 13) gives a higher figure of 400,000 passengers per year although we understand that this is based on a higher assumed number of rotations per day. Ryanair: Assessment of Airline Bargaining Power at Stansted Airport, RBB economics, November 2011. This document can be accessed at: <http://www.caa.co.uk/docs/5/rbb%20stansted%20final%20non-confidential%20version%2029%20Nov%202011.pdf>

**Table 4: Critical loss of aircraft – Ryanair aircraft assumptions**

SSNIP increment	Increase in aeronautical revenue	
	5%	10%
<b>Passenger loss</b>		
Critical loss (mppa) (SDG opex elasticity)	0.791	1.514
Critical loss (mppa) (CC opex elasticity)	0.654	1.261
<b>ATM loss (per year)</b>		
Critical loss of ATMs (SDG) per year	5,102	9.771
Critical loss of ATMs (CC) per year	4,217	8,137
<b>ATM loss (per day)</b>		
Critical loss of ATMs per day (SDG)	14	27
Critical loss of ATMs per day (CC)	12	22
<b>Loss of based aircraft</b>		
Critical loss of based aircraft per day (SDG)	2	4
Critical loss of based aircraft per day (CC)	2	4

Source: CAA calculations, assumed 3 rotations or 6 ATMs per based aircraft per day.

Note: ATM – Air Traffic Movement

**Table 5: Critical loss of aircraft – Ryanair aircraft assumptions**

SSNIP increment	Increase in aeronautical revenue	
	5%	10%
<b>Passenger loss</b>		
Critical loss (mppa) (SDG opex elasticity)	0.791	1.514
Critical loss (mppa) (CC opex elasticity)	0.654	1.261
<b>Loss of based aircraft</b>		
Critical loss of based a/c per day (SDG)	3	5
Critical loss of based a/c per day (CC)	2	4

Source: Assumes 300,000 passengers per based aircraft and CAA analysis

*Based on easyJet aircraft assumptions*

1.7 easyJet makes up around 22 per cent of passengers at Stansted. The easyJet fleet mix is shown in Table 6. Based on a typical load factor of 89 per cent this gives an average of 144 passengers per aircraft. The CAA analysis, shown in Table 7, implies that a withdrawal of between 2 and 5 based aircraft (all year) would be sufficient to offset the charge increase. Cross checking against an average load of 350,000 passengers per based aircraft per year<sup>7</sup>, implies a withdrawal of between 2 to 4 aircraft per year (see Table 8).

**Overall conclusions**

1.8 Overall this analysis implies that based operators at Stansted would need to withdraw between 2 and 5 based aircraft, year round, to make a small but significant price increase unprofitable for the airport operator.

**Table 6: easyJet aircraft fleet mix**

	Number of aircraft	Seats per aircraft
<b>A319-100</b>	160	156
<b>A320-200</b>	54	180
<b>Total</b>	214	162
<b>Average load factor</b>		89%
<b>Passengers per ATM</b>		144

Source: Page 15 and 21, easyJet Annual report 2012 <http://corporate.easyjet.com/~media/Files/E/Easyjet-Plc-V2/pdf/investors/result-center-investor/annual-report-2012.pdf>

<sup>7</sup> Frontier Economics, Market power assessment: Gatwick and Stansted Airport: Report for easyJet, November 2011, p. 18. This document can be accessed at: [http://www.caa.co.uk/docs/5/rpt-easyJet%20Competition%20Assessment%20Final%20Report\\_Abridged.pdf](http://www.caa.co.uk/docs/5/rpt-easyJet%20Competition%20Assessment%20Final%20Report_Abridged.pdf)

**Table 7: Critical loss of aircraft – easyJet aircraft assumptions**

SSNIP increment	Increase in aeronautical revenue	
	5%	10%
<b>Passenger loss</b>		
Critical loss (mppa) (SDG opex elasticity)	0.791	1.514
Critical loss (mppa) (CC opex elasticity)	0.654	1.261
<b>ATM loss (per year)</b>		
Critical loss of ATMs (SDG) per year	5,501	10,535
Critical loss of ATMs (CC) per year	4,547	8,773
<b>ATM loss (per day)</b>		
Critical loss of ATMs per day (SDG)	15	29
Critical loss of ATMs per day (CC)	12	24
<b>Loss of based aircraft</b>		
Critical loss of based aircraft per day (SDG)	3	5
Critical loss of based aircraft per day (CC)	2	4

Source: CAA calculations, assumed 3 rotations or 6 ATMs per based aircraft per day

**Table 8: Critical loss of aircraft – easyJet aircraft assumptions**

SSNIP increment	Increase in aeronautical revenue	
	5%	10%
<b>Passenger loss</b>		
Critical loss (mppa) (SDG opex elasticity)	0.791	1.514
Critical loss (mppa) (CC opex elasticity)	0.654	1.261
<b>Loss of based aircraft</b>		
Critical loss of based a/c per day (SDG)	2	4
Critical loss of based a/c per day (CC)	2	4

Source: Assumes 350,000 passengers per based aircraft and CAA analysis