

Market Response to Airport Capacity  
Expansion: Additional estimates airline  
responses





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# Market Response to Airport Capacity Expansion: additional estimates airline responses

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## Table of contents

<b>1</b>	<b>Market Response to Airport Capacity Expansion: Additional estimates</b>	
	<b>airline responses .....</b>	<b>1</b>
1.1	Introduction .....	1
1.2	Airline responses .....	2
1.3	Modelled welfare impacts .....	3
3a.	Gatwick expansion option .....	4
3 b.	Heathrow additional runway (HAL) option .....	8
3c.	Heathrow extended northern runway option (HHL) option.....	10
1.4	Discussion.....	11
<b>Annex 1</b>	<b>Sensitivity analysis of assumptions on transfer shares .....</b>	<b>17</b>



# 1 Market Response to Airport Capacity Expansion: Additional estimates airline responses

## 1.1 Introduction

This report presents the results of modelled estimates for the impact of airline responses on competition, connectivity and scarcity rents following capacity expansion at Gatwick or Heathrow. Consumer benefits are estimated for 2030 and 2040. In December 2014, ITF/SEO estimated the consumer benefits for four airline responses under three different Airports Commission growth scenarios. We refer to this report for a discussion of the methodology applied.<sup>1</sup> The present report summarises analysis of two additional potential airline response paths following Gatwick expansion and two airline response paths following Heathrow expansion for 2030 and 2040 under the Airports Commission's Assessment of Need scenario. The paths analysed under the Assessment of Need scenario are as follows:

### Heathrow expansion

- Hub carrier growth at Heathrow, point-to-point growth at Gatwick (2030 and 2040)
- Point-to-point growth at Heathrow and Gatwick (2030 and 2040)

### Gatwick expansion

- Gatwick becomes low-cost gateway, Heathrow remains network hub (2030 and 2040)
- Point-to-point growth at Gatwick, Heathrow remains network hub (2030 and 2040)

In addition, we provide estimates for the impact in 2030 and 2040 of two airline response paths following Gatwick expansion under the's Low Cost is King Scenario. The airline response paths considered are 'Gatwick becomes a low-cost gateway' and 'Point-to-point growth at Gatwick'.<sup>2</sup>

The results presented are based on the Airports Commission passenger forecasts in a carbon-traded world, with a discussion of what would potentially happen if the carbon capped scenario applied.

In the following sections, first, we briefly recap the four airline response paths considered. Next, we present the results for the expansion options Gatwick, Heathrow new north-west runway and Heathrow extended northern runway. Each section presents results for the two airline response paths in 2030 and 2040, followed by a brief discussion. In a concluding section we summarize our findings, cross-comparing these results. A final section considers how the results would be influenced in a carbon capped world.

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<sup>1</sup> ITF/SEO (2014). Impacts of Expanding Airport Capacity on Competition and Connectivity. The case of Gatwick and Heathrow. <http://www.internationaltransportforum.org/Pub/pdf/14Impacts-Airport-Capacity.pdf>

<sup>2</sup> There have been minor modifications in the model and assumptions compared to the ITF/SEO report of December 2014. Annex 1 lists these improvements and how they affect the results.

Table 1.1. Summary of Airline Response Paths Analysed in this Report

Airline response	Gatwick		Heathrow			
	Low cost gateway	Point to point growth	Hub carrier growth		Point to point growth	
Runway option			HAL, new northeast runway	HHL, extended runway	HAL, new northeast runway	HHL, extended runway
Assessment of Need Scenario	✓	✓	✓	✓	✓	✓
Low Cost is King Scenario	✓	✓				

## 1.2 Airline responses

In this section we summarise the airline response paths. For an extensive description of these responses see the ITF/SEO report of December 2014. Annex 1 outlines the scheme followed to structure the four airline responses.

### Heathrow expansion

#### **Airline response A:<sup>3</sup> Hub carrier growth at Heathrow, point-to-point growth at Gatwick:**

The hub carrier and partners benefit from additional capacity at London Heathrow as it enables operation of a more efficient, fully developed wave-system for coordinating arrivals and departures at the airport, maximising opportunities for transfer between flights. This results in higher transfer shares for Oneworld carriers at Heathrow. A significant share of Oneworld carrier operations currently operated from Gatwick move to Heathrow. Oneworld carriers only continue to operate a few flights to leisure destinations from Gatwick, with a limited share of 'guided' transfer traffic.

#### **Airline response B: Point-to-point growth at Heathrow and Gatwick, Heathrow remains the network hub**

Additional capacity at Heathrow is primarily taken up by point-to-point carriers. LCC and point-to-point carriers gain market share at the expense of Oneworld carriers, both at Gatwick and Heathrow. As a result of more competitive pressure and less growth of Oneworld, transfer demand is crowded out as demand increases. Overall, transfer traffic increases in absolute terms but the share of transfer traffic of Oneworld airlines at Heathrow remains the same as in the 'do minimum' scenario.

### Gatwick expansion

#### **Airline response C: Partnerships: Gatwick becomes a low-cost gateway, Heathrow remains the network hub**

Low cost carriers gain market share at Gatwick at the expense of full service carriers. At Gatwick, in both long-haul and short-haul markets the presence of low cost carriers increases. To create

<sup>3</sup> The previous report (ITF/SEO2014) examined 6 potential airline response paths, 3 for expansion at Heathrow, 3 for expansion at Gatwick. The four response paths examined in the present report correspond to responses 1, 3, 5 and 6 in the previous report.



more route density, low cost carriers start to carry a limited amount of transfer traffic (10%). At Heathrow, the market share of Oneworld carriers remains stable compared to the ‘do minimum’ scenario. As growth at Heathrow is limited, transfer shares do not change with respect to the ‘do minimum’ scenario. Compared to the ‘unconstrained’ scenario for Heathrow, transfer traffic is ‘crowded out’ to a certain extent.

**Airline response D: Gatwick point-to point-growth, Heathrow remains the network hub**

Point-to-point carriers take up all additional Gatwick capacity. The market share of Oneworld carriers at Gatwick decreases. Similarly to airline response 3, Heathrow remains the network hub. The market share of Oneworld carriers remains stable and transfer shares do not decrease with respect to the ‘do minimum’ scenario.

### 1.3 Modelled welfare impacts

In this section, aviation scenario-airline response combinations are evaluated in terms of consumer welfare impacts, arising from connectivity gains, changes in competition levels and reduction in airline scarcity rents. The SEO Netcost model is used to estimate these effects, see ITF/SEO 2014 and SEO for a description of the methodology.

The tables summarise the results of modelling consumer welfare changes and compare direct benefits, per passenger and in total, with a do-minimum case where there is no expansion of runway capacity in the London airports system.

### 3a. Gatwick expansion option

#### Assessment of Need Scenario

Table 1.2 LCC or point-to-point growth at Gatwick results in positive welfare effects for OD passengers; transfer passengers benefit less from a Gatwick expansion.

	Gatwick becomes low-cost gateway, Heathrow remains network hub				Point-to-point growth at Gatwick, Heathrow remains network hub			
	2030		2040		2030		2040	
<b>Benefit / OD passenger</b>	£	<b>2.22</b>	£	<b>7.60</b>	£	<b>3.84</b>	£	<b>9.61</b>
Connectivity	£	0.59	£	2.28	£	0.59	£	2.29
Competition	£	0.64	£	0.52	£	0.29	£	0.09
Scarcity	£	0.99	£	4.79	£	2.96	£	7.23
<b>Benefit / transfer passenger</b>	£	<b>0.27</b>	£	<b>1.57</b>	-£	<b>0.43</b>	£	<b>0.49</b>
<b>Number of OD passengers</b>		<b>165,770</b>		<b>188,449</b>		<b>168,623</b>		<b>192,112</b>
Heathrow		71,281		77,693		71,420		77,841
Gatwick		45,435		57,192		48,150		60,707
City		6,474		6,418		6,474		6,418
Luton		11,903		15,127		11,903		15,127
Stansted		30,676		32,018		30,676		32,018
OD passengers constrained		164,546		176,811		164,546		176,801
<b>Number of transfer passengers</b>		<b>24,200</b>		<b>26,740</b>		<b>21,581</b>		<b>23,295</b>
Heathrow		21,452		23,137		21,313		22,988
Gatwick		2,748		3,603		268		307
City		0		0		0		0
Luton		0		0		0		0
Stansted		0		0		0		0
Transfer passengers constrained		21,851		23,355		21,851		23,355
<b>Total passenger benefits (GBP mln.)</b>		<b>373</b>		<b>1,430</b>		<b>630</b>		<b>1,783</b>
UK		227		914		383		1,140
Non-UK		146		516		247		644
<b>Total benefits OD passengers (GBP mln.)</b>		<b>367</b>		<b>1,388</b>		<b>639</b>		<b>1,772</b>
Business		92		356		161		455
Leisure		274		1,032		478		1,317
Connectivity		97		417		98		422
Competition		106		95		48		16
Scarcity		164		876		493		1,334
<b>Benefits transfer passengers (mln GBP)</b>		<b>7</b>		<b>42</b>		<b>-9</b>		<b>11</b>

Source: SEO Netcost

The consumer benefits per OD passenger under Gatwick expansion are relatively small in 2030 under the Assessment of Need Scenario. This mainly reflects the passenger forecasts for this scenario. The total number of passengers at all London airports in the 'do minimum' scenario adds up to 184 million. This increases only by 4 million after the expansion of Gatwick in the Assessment of Need Scenario, resulting in limited consumer benefits. In 2040, consumer benefits are higher as there is a stronger difference in passenger numbers between the expansion and do-minimum cases.

In 2040 the consumer benefits per OD passenger are GBP 7.60 and 9.61 in the LCC gateway and point-to-point growth airline responses, respectively. The benefits in the latter response are higher, as all new capacity at Gatwick is used by OD passengers, while LCCs also carry transfer traffic in the LCC gateway scenario. Transfer passengers are more price sensitive than OD passenger, so the costs of travelling do not need to decrease as much as in the case of OD passengers to change their behaviour. This in turn leads to smaller impacts of expansion when the share of transfer passengers is higher

Competition effects are higher in the LCC gateway airline response than in the point-to-point growth response. In the latter airline response, competition by low cost carriers gradually reduces full service carrier supply at Gatwick (including that of Oneworld carriers), leading to more competition and therefore lower airfares. In the LCC gateway scenario the shift from Oneworld and other full service carriers to point-to-point carriers is much stronger, leading to higher consumer benefits attributed to competition.

The benefits per transfer passenger are relatively low in both airline responses, in comparison to airline responses following Heathrow expansion. This is because transfer traffic is mainly influenced by developments at Heathrow. In the two airline responses Heathrow remains the network hub for Oneworld, therefore there is no difference in airline presence at Heathrow between the two scenarios. The effects in the LCC gateway airline response are slightly higher, as LCCs carry some transfer traffic in this airline response.

## Low Cost is King Scenario

Table 1.3 OD passengers strongly benefit from an expansion of Gatwick under the Low Cost is King Scenario; benefits for transfer passengers are low or negative.

	Gatwick becomes low-cost gateway, Heathrow remains network hub				Point-to-point growth at Gatwick, Heathrow remains network hub			
	2030		2040		2030		2040	
<b>Benefit / OD passenger</b>	£	<b>17.89</b>	£	<b>34.12</b>	£	<b>20.34</b>	£	<b>35.77</b>
Connectivity	£	3.63	£	6.42	£	3.54	£	6.32
Competition	£	1.92	£	2.87	£	1.51	£	1.81
Scarcity	£	12.35	£	24.83	£	15.29	£	27.64
<b>Benefit / transfer passenger</b>	-£	<b>3.34</b>	£	<b>1.29</b>	-£	<b>8.35</b>	-£	<b>14.11</b>
<b>Number of OD passengers (x 1000)</b>		<b>187,041</b>		<b>217,441</b>		<b>191,869</b>		<b>222,396</b>
Heathrow		68,161		73,117		68,278		73,231
Gatwick		67,747		88,020		72,458		92,862
City		6,778		6,285		6,778		6,285
Luton		15,016		15,793		15,016		15,793
Stansted		29,339		34,225		29,339		34,225
OD passengers constrained (x 1000)		169,579		185,299		169,579		185,299
<b>Number of transfer passengers (x 1000)</b>		<b>25,406</b>		<b>28,277</b>		<b>20,724</b>		<b>22,328</b>
Heathrow		20,559		22,121		20,442		22,007
Gatwick		4,847		6,156		282		320
City		0		0		0		0
Luton		0		0		0		0
Stansted		0		0		0		0
Transfer passengers constrained (x 1000)		22,422		25,262		22,422		25,262
<b>Total passenger benefits (mln. GBP)</b>		<b>3,106</b>		<b>6,907</b>		<b>3,503</b>		<b>6,977</b>
UK		1,889		4,187		2,131		4,229
Non-UK		1,217		2,720		1,372		2,748
<b>Total benefits OD passengers (mln. GBP)</b>		<b>3,191</b>		<b>6,871</b>		<b>3,676</b>		<b>7,292</b>
Business		804		1,839		926		1,952
Leisure		2,387		5,031		2,750		5,340
Connectivity		647		1,292		640		1,289
Competition		342		578		272		370
Scarcity		2,202		5,001		2,764		5,634
<b>Benefits transfer passengers (mln. GBP)</b>		<b>-85</b>		<b>36</b>		<b>-173</b>		<b>-315</b>

Source: SEO Netcost

The relatively high GDP growth assumption in the Low Cost is King Scenario results in higher passenger forecasts and therefore higher consumer benefits following runway capacity expansion. We find similar results for the two airline response paths following expansion at Gatwick in both 2030 and 2040.

Benefits for OD passengers are somewhat higher in the point-to-point growth airline response at Gatwick. This follows from the fact that point-to-point carriers do not carry transfer traffic, while there are transfer passengers in the LCC gateway scenario, albeit a limited number. Additional capacity at Gatwick is fully utilised by OD passengers in the second airline response.

The consumer benefits for transfer passengers are lower compared to the Assessment of Need scenario. As follows from the Airports Commission's Low Cost is King Scenario, there is a shift of traffic from Heathrow to Gatwick and passenger numbers at Heathrow are lower in the Low Cost is King Scenario. The share of transfer traffic at Gatwick is limited and this capacity expansion is almost entirely utilised by OD traffic. Therefore, the overall number of transfer passengers decreases, yielding negative consumer benefits in this segment. In the LCC gateway scenario, the presence of transfer traffic on low cost carriers results in a positive result for transfer passengers in 2040.

Competition effects are larger in the LCC gateway scenario, resulting from the increase in low-cost carrier market share and its downward pressure on fares.

We note that there is uncertainty with respect to how much transfer traffic is crowded out as a result of shrinking excess capacity. Annex 2 provides a sensitivity analysis for the LCC gateway scenario in 2040, with varying degrees of 'crowding out'.

### 3 b. Heathrow additional runway (HAL) option

#### Assessment of Need Scenario

Table 1.4 Both transfer and OD passengers benefit from hub carrier growth at Heathrow, point-to-point growth results in large benefits for OD passengers

	Hub carrier growth at Heathrow, point-to-point growth at Gatwick				Point-to-point growth at Heathrow and Gatwick; Heathrow remains the network hub			
	2030		2040		2030		2040	
<b>Benefit / OD passenger</b>	£	<b>9.00</b>	£	<b>18.32</b>	£	<b>27.52</b>	£	<b>37.29</b>
Connectivity	£	1.99	£	5.72	£	2.18	£	5.86
Competition	£	0.20	£	0.25	£	1.74	£	2.00
Scarcity	£	6.81	£	12.35	£	23.59	£	29.42
<b>Benefit / transfer passenger</b>	£	<b>34.73</b>	£	<b>39.98</b>	-£	<b>3.12</b>	£	<b>1.18</b>
<b>Number of OD passengers</b>		<b>170,569</b>		<b>195,120</b>		<b>187,163</b>		<b>214,800</b>
Heathrow		87,097		100,521		103,689		119,858
Gatwick		37,749		41,590		37,751		41,933
City		4,558		6,778		4,558		6,778
Luton		10,861		12,758		10,861		12,758
Stansted		30,304		33,472		30,304		33,472
OD passengers constrained		164,124		176,355		164,546		176,811
<b>Number of transfer passengers</b>		<b>38,028</b>		<b>43,660</b>		<b>22,014</b>		<b>25,293</b>
Heathrow		37,839		43,440		21,592		24,803
Gatwick		189		220		422		490
City		0		0		0		0
Luton		0		0		0		0
Stansted		0		0		0		0
Transfer passengers constrained		22,272		23,812		21,851		23,355
<b>Total passenger benefits (GBP mln.)</b>		<b>2,827</b>		<b>5,149</b>		<b>4,771</b>		<b>7,331</b>
UK		1,612		3,056		2,722		4,351
Non-UK		1,214		2,096		2,049		2,980
<b>Total benefits OD passengers (GBP mln.)</b>		<b>1,506</b>		<b>3,403</b>		<b>4,840</b>		<b>7,301</b>
Business		377		851		1,210		1,826
Leisure		1,129		2,552		3,629		5,475
Connectivity		333		1,063		384		1,148
Competition		34		46		307		391
Scarcity		1,139		2,294		4,149		5,762
<b>Benefits transfer passengers (mln GBP)</b>		<b>1,321</b>		<b>1,746</b>		<b>-69</b>		<b>30</b>

Source: SEO Netcost

There is a large difference in the consumer benefits arising under the two airline responses paths modelled following Heathrow expansion. The hub carrier growth path at Heathrow results in a large increase in transfer traffic – almost as high as in the unconstrained demand scenario. In the point-to-point growth path, the transfer share does not increase compared to the capacity constrained, do-minimum case. Supply and demand balance with less reduction in generalised costs under the hub carrier growth response path because of its accommodation of transfer traffic, which is much more price-elastic than OD traffic.

Under the Assessment of Need Scenario, the consumer benefits of Heathrow expansion are much larger than the benefits modelled for Gatwick expansion. This is driven by the large difference in the total amount of passengers at London airports between the two expansion options. Under the Gatwick expansion option, in 2030 the Airports Commission Scenario foresees a total of 188 million passengers, compared to 205 million for Heathrow expansion. The potential for a reduction in scarcity rents is therefore much higher in the case of Heathrow expansion.

In a point-to-point growth airline response, Oneworld carriers lose market share to other airlines. These carriers provide more seats for OD passengers and generally offer lower ticket prices. This results in positive welfare effects. Added to this, a decreasing market share for Oneworld at London Heathrow results in a decrease in airfares. The model results imply that in 2040 an average ticket is 2 pounds cheaper because of an increase in competition.<sup>4</sup>

On the other hand, welfare benefits for transfer passengers are relatively low with point-to-point growth. In 2030 a negative welfare effect is observed, as the capacity shift to other airlines results in a decrease of transfer passengers at Heathrow. In 2040, the welfare effects for transfer passengers are slightly positive, as the additional capacity leads to an increase in transfer passengers in this year.

Consumer benefits from competition are low under the hub carrier growth response path. As Oneworld is the dominant airline group for a large number of destination regions, an increased market share of Oneworld leads to a decrease in competition.

In Annex 2 a sensitivity analysis is provided. This analysis shows how the results are affected in 2030 by using higher or lower transfer shares in the hub carrier growth response path at Heathrow.

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<sup>4</sup> In the ITF/SEO paper of December 2014 we argued that decreases in scarcity rents translates into lower ticket prices. Any increases in aero-charges are absorbed by the airlines through a further reduction of scarcity rents. See: <http://www.internationaltransportforum.org/Pub/pdf/14Impacts-Airport-Capacity.pdf>. We also refer to the ITF/SEO note on scarcity rents and aero-charges.

### 3c. Heathrow extended northern runway option (HHL) option

#### Assessment of Need Scenario

Table 1.5 Results following the extended northern runway option are similar to those found for the additional north west runway option

	Hub carrier growth at Heathrow, point-to-point growth at Gatwick				Point-to-point growth at Heathrow and Gatwick; Heathrow remains the network hub			
	2030		2040		2030		2040	
<b>Benefit / OD passenger</b>	£	<b>9.06</b>	£	<b>14.25</b>	£	<b>27.45</b>	£	<b>33.28</b>
Connectivity	£	2.02	£	4.90	£	2.21	£	5.01
Competition	£	0.20	£	0.22	£	1.81	£	1.95
Scarcity	£	6.83	£	9.13	£	23.43	£	26.31
<b>Benefit / transfer passenger</b>	£	<b>34.74</b>	£	<b>37.48</b>	-£	<b>2.98</b>	-£	<b>2.00</b>
<b>Number of OD passengers</b>		<b>170,674</b>		<b>191,164</b>		<b>187,530</b>		<b>210,177</b>
Heathrow		87,137		95,611		103,742		114,293
Gatwick		37,740		42,027		37,988		42,358
City		4,564		6,574		4,564		6,574
Luton		10,929		13,655		10,932		13,655
Stansted		30,304		33,297		30,304		33,297
OD passengers constrained		164,124		176,354		164,546		176,811
<b>Number of transfer passengers</b>		<b>38,047</b>		<b>41,548</b>		<b>22,028</b>		<b>24,053</b>
Heathrow		37,858		41,329		21,606		23,562
Gatwick		189		220		422		491
City		0		0		0		0
Luton		0		0		0		0
Stansted		0		0		0		0
Transfer passengers constrained		22,272		23,812		21,851		23,355
<b>Total passenger benefits (GBP mln.)</b>		<b>2,838</b>		<b>4,176</b>		<b>4,766</b>		<b>6,391</b>
UK		1,619		2,508		2,719		3,838
Non-UK		1,219		1,668		2,047		2,553
<b>Total benefits OD passengers (GBP mln.)</b>		<b>1,516</b>		<b>2,619</b>		<b>4,831</b>		<b>6,439</b>
Business		379		674		1,208		1,658
Leisure		1,137		1,944		3,623		4,781
Connectivity		338		900		388		970
Competition		34		41		318		378
Scarcity		1,144		1,678		4,125		5,091
<b>Benefits transfer passengers (mln GBP)</b>		<b>1,322</b>		<b>1,557</b>		<b>-66</b>		<b>-48</b>

Source: SEO Netcost



For 2030 the results are very similar for both runway options at Heathrow. In 2040 the results for the extended northern runway show slightly lower benefits than for a new runway. The capacity expansion following extension of the northern runway is smaller than with a new additional runway.

As capacity limits are reached by 2040, consumer benefits are lower than in the option where a new runway is built. In the hub carrier growth airline response, the total welfare effect is around 1 billion pounds lower than for the new runway option (6.3 billion versus 7.3 billion).

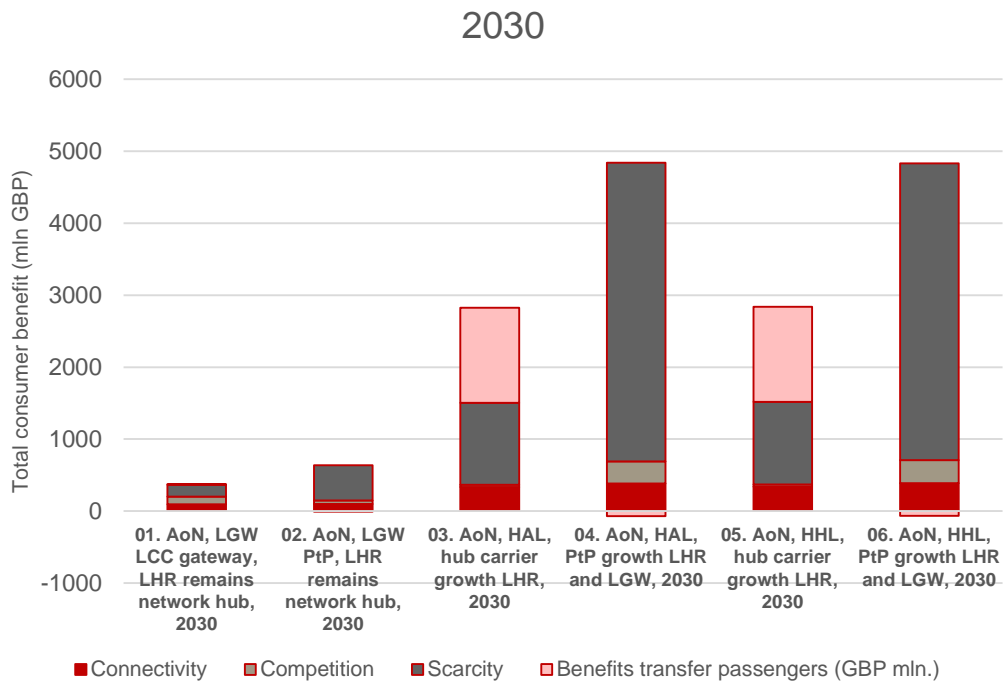
While the consumer benefits for transfer passengers were positive in the Heathrow new runway option, these are negative in 2040 in the extended runway scenario. As the latter option offers less capacity, this results in stronger decrease in transfer passengers in some destination regions.

## 1.4 Discussion

### Cross-comparison of expansion option results

Figure 1.1 shows the consumer benefits for the six expansion option/airline response combinations presented in this report. On the graph, bars 01 and 02 are the results for Gatwick expansion, bars 03 and 04 show the results for Heathrow Airport Limited's (HAL) plans for a new north west runway and bars 05 and 06 are for Heathrow Hub Limited's (HHL) proposal to extend the northern runway. As the figure shows, the benefits resulting from expansion at Heathrow are higher than those following Gatwick expansion. In the hub carrier growth at Heathrow airline responses, consumer benefits for transfer passengers are largest. Total consumer benefits are highest in case of an airline response that sees point-to-point growth at Heathrow and Gatwick, as capacity expansion leads to a large decrease in scarcity rents for OD passengers. The highest consumer benefits for connectivity and competition are realized in this configuration too.

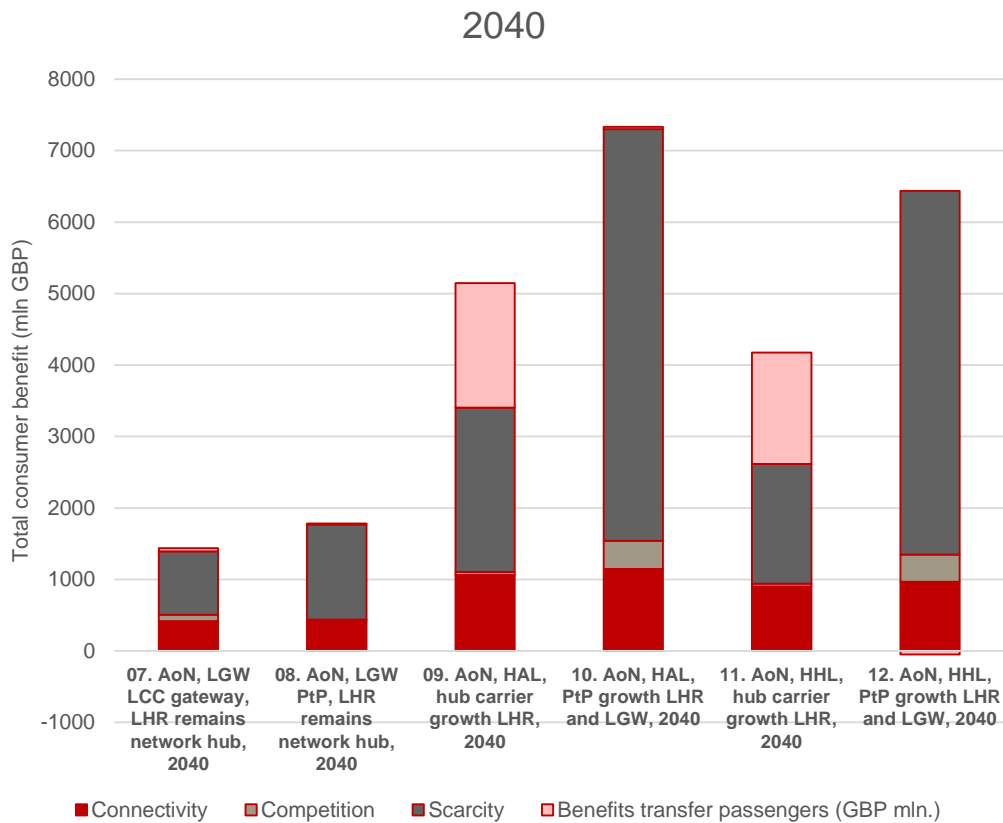
Figure 1.1 Consumer benefits under the Assessment of Need Scenario in 2030



Source: SEO Netcost

Figure 1.2 shows the results for the estimated consumer benefits in 2040. The aggregate benefits are higher than in 2030, but show the same general pattern. The relative increase with respect to the benefits in 2030 is largest for the Gatwick expansion options. Nevertheless, consumer benefits following a Heathrow expansion are still higher. In 2040 a stronger difference is observed between the two Heathrow expansion options. As the extended runway option (HHL) provides a little less additional capacity than the new runway option, benefits in the latter expansion option are higher.

Figure 1.2 Consumer benefits under the Assessment of Need Scenario in 2040



Source: SEO Netcost

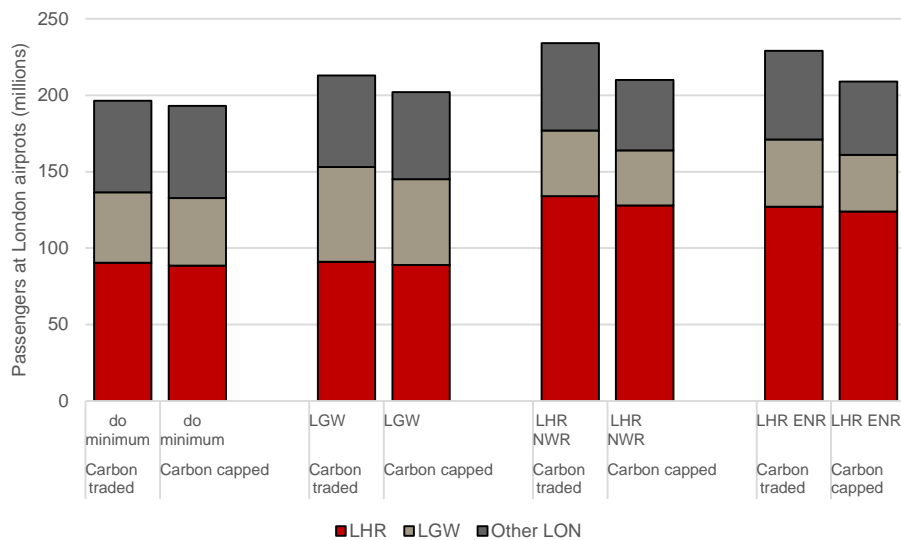
### Results in the carbon capped scenario

All results presented above are developed under the scenario for a carbon traded world developed by the Airports Commission. Under its carbon capped scenario results would potentially be different. In this section we discuss the differences and what kind of impact they have on our results.

In the carbon traded scenario it is assumed that aviation participates in an emissions trading scheme and so net CO<sub>2</sub> emissions costs are included in airfares. The Airports Commission’s carbon capped scenario instead assumes that the CO<sub>2</sub> emissions of UK aviation in 2050 are constrained to be below the level of 2005.

This results in lower passenger forecasts in the carbon capped scenarios. Lower passenger numbers would imply smaller consumer benefits. Figure 1.3 shows the passenger number forecasts of the Airports Commission under the Assessment of Need scenario for 2040 for a carbon traded and a carbon capped world (the forecasts for 2030 show the same pattern). In the Low Cost is King Scenario the difference between the carbon capped and carbon traded variants is larger as the underlying growth in passenger demand is stronger, making the carbon cap more restrictive in this scenario.

**Figure 1.3 Passenger numbers in the carbon capped forecasts in the Assessment of Need Scenario for 2040**



Source: Airports Commission Report: Strategic Fit: Forecasts; elaboration SEO

One can observe the difference between the carbon capped and carbon traded scenario is largest in the two Heathrow expansion scenarios. The Commission attributes this to the increase of long-haul flights at Heathrow: these flights cause a relatively strong increase in UK's total seat-kilometres and thus use more of UK's carbon budget.<sup>5</sup> This implies that the estimated benefits following a Heathrow expansion would be reduced more in the carbon capped scenario than the estimated benefits following Gatwick expansion.

In the Heathrow expansion scenarios, passenger numbers for Heathrow remain relatively stable, while demand at other airports decreases. As transfer traffic is largely concentrated at Heathrow, consumer benefits for these passengers will be similar to those in the carbon traded scenario. The largest part of the decrease in consumer benefits will be a result of the reduction in OD passengers at the other London airports.

The results for the Gatwick expansion options will show the strongest difference in the Low Cost is King Scenario. In this scenario there are 10 million passengers less at Gatwick in the carbon capped case compared to the carbon traded case. Again, the biggest impact on consumer benefits will come from a reduction in OD passengers. Traffic volumes at Heathrow will remain relatively stable, leaving benefits for transfer passengers largely unchanged.

Passenger benefits are estimated based on relative difference between the expansion options and a do-minimum scenario. The passenger forecast in the do-minimum scenario is also lower in a carbon capped world. This will generate a slight increase in passenger benefits modelled, too small to alter much the decreases in passenger numbers described above.

<sup>5</sup> Airports Commission. Strategic Fit: Forecasts. November 2014. (pp. 103)

Although a carbon cap puts limits to the growth of the number of air passengers, there would still be significant consumer benefits following capacity expansion of Gatwick or Heathrow. For all expansion options the number of passengers is higher in comparison with the ‘do-minimum’ scenario, implying there is substantial demand for additional capacity in the London airport system. This translates into passenger benefits arising from a decrease in scarcity rents and/or an increase in competition level, potentially leading to lower fares for some passengers.

## References

ITF/SEO (2014). Impacts of Expanding Airport Capacity on Competition and Connectivity. The case of Gatwick and Heathrow. <http://www.internationaltransportforum.org/Pub/pdf/14Impacts-Airport-Capacity.pdf>

Airports Commission (2014). Strategic Fit: Forecasts



## Annex 1 Sensitivity analysis of assumptions on transfer shares

To provide consistent results for all scenarios, we structured the airline responses under all of the Airports Commission's scenarios following the scheme below. Traffic volume forecasts are taken from the Airports Commission scenarios. The airline responses consider the potential shift of traffic between different airline groups at Heathrow and Gatwick.

The share of transfer traffic is also determined in each scenario. When the hub carrier is less subject to capacity restrictions transfer shares will be higher, sustaining a larger route network. When there is less room for growth for the hub carrier it will try to focus at the more lucrative OD segment, resulting in lower transfer shares. Table 1.6 shows the transfer shares for Oneworld carriers in the unconstrained and do-minimum cases for the Assessment of Need Scenario.

**Table 1.6 Transfer shares at Heathrow and Gatwick in the unconstrained and do-minimum scenario.**

				Heathrow expansion		Gatwick expansion	
Unconstrained		do minimum	Hub carrier growth at Heathrow	PtP growth at Heathrow and Gatwick	Gatwick becomes LCC gateway	PtP growth at Gatwick	
<b>Heathrow</b>							
ICA	60%	45%	59%	45%	45%	45%	
EUR	50%	40%	49%	40%	40%	40%	
<b>Gatwick</b>							
ICA	15%	10%	5%	5%	5%	5%	
EUR	10%	5%	2.5%	2.5%	2.5%	2.5%	
LCC	0%	0%	0%	0%	10%	0%	
<b>Traffic shift</b>			25% of Oneworld traffic at Gatwick moves to Heathrow	25% of short-haul Oneworld traffic at Heathrow replaced by LCC. 25% of long-haul traffic at Heathrow and Gatwick transferred to Virgin or leisure carrier	25% of FSC-traffic at Gatwick replaced by LCCs or leisure carriers	All increased capacity is accommodated by LCC/leisure carriers; Oneworld capacity is equal to the capacity in the 'do-minimum' scenario	

Notes: ICA – Intercontinental; EUR – Europe; LCC – Low cost carriers.

Source: SEO Economic Research

In comparison to the ITF/SEO report of December 2014, there have been minor modifications in the modelling procedure and airline responses, leading to slight differences in the consumer benefits calculated. In particular the benefits per transfer passenger are somewhat different. The airline responses modelled in both reports are Gatwick becomes LCC gateway following Gatwick expansion and Hub carrier growth at Heathrow following Heathrow expansion – both for 2030.

In the Heathrow expansion scenarios the present report uses separate passenger forecasts for the two expansion options. In the December 2014 report an average of the two forecasts was used. As the two forecasts are strongly similar, results are only marginally impacted.

In the LCC gateway scenario the share of Oneworld transfer passengers at Heathrow does not increase with respect to the do-minimum scenario in the present report. In this airline response there is a shift of (transfer) traffic from Heathrow to Gatwick. As Heathrow is not expanded, it is likely that the share of transfer passengers for Oneworld at Heathrow does not increase. This leads to lower benefits for transfer passengers compared to the results in the December 2014 report, where we assumed a slight increase of transfer traffic at Heathrow.

The transfer share for Oneworld carriers at Gatwick decreases with respect to the ‘do minimum’ scenario in all four airline responses. This decrease is modelled as all four airline responses invoke point-to-point growth at Gatwick. Following a capacity expansion at either Gatwick or Heathrow, Oneworld may strive to concentrate its hub traffic at Heathrow and limit the amount of transfer traffic at Gatwick. As there are relatively few transfer passengers at Gatwick, the total passenger benefits for transfer passengers – via all London airports – are only marginally lower with respect to the results in the December 2014 report.

### **Sensitivity analysis**

The extent to which transfer passengers use additional capacity influences the consumer benefits modelled. Transfer passengers are more price-elastic than OD passengers. In our analysis we assume an elasticity of -3 for transfer passengers and an elasticity of -1 for OD passengers. Given these elasticities, the price reduction needed to fill up the new capacity with transfer passengers is much lower than increasing the number of OD passengers by the same amount. The difference in elasticity also means that consumer benefits resulting from an increase in transfer passengers are lower than consumer benefits arising from an increase in OD passengers.

As a hub carrier needs a certain amount of transfer passengers to profitably operate its overall network we determined the share of transfer passengers for each carrier group exogenously. For both the unconstrained and do-minimum cases we assumed that only Oneworld members carry transfer traffic.

In this section we illustrate how these assumptions affect our results, and include a sensitivity analysis assuming higher and lower transfer shares. We include this sensitivity analysis for two combinations of expansion, Scenario and airline response options:

- 2030, Heathrow north-west runway addition, Assessment of Need Scenario, Hub carrier growth at Heathrow;
- 2040, Gatwick expansion, Low Cost is King Scenario, Gatwick becomes LCC gateway.

In the airline responses, the transfer shares at Heathrow are set to lie in between the unconstrained and constrained transfer shares. At Heathrow, we assume that the transfer share across intercontinental routes operated by all carriers decreases by 15% with respect to the unconstrained scenario. For routes within Europe we assume it is 10% lower than the unconstrained case. The sensitivity analysis in the next section examines consumer benefits when the share of transfer traffic is set at the level of the do-minimum scenario and in a case where the



transfer shares are set higher than in the unconstrained scenario. In the latter case, additional capacity is used more by transfer traffic, leading to smaller consumer benefits in the OD market.

**Table 1.7 Assessment of Need Scenario, Heathrow expansion with new northwest runway, Hub carrier growth at Heathrow, results for 2030**

Sensitivity test case	Hub carrier growth at Heathrow		
	Standard airline response	Transfers as in do-minimum case	Transfers above unconstrained case
Transfer share ICA	59%	45%	65%
Transfer share EUR	49%	40%	55%
<b>Benefit / OD passenger</b>	<b>£ 9.00</b>	<b>£ 18.95</b>	<b>£ 4.08</b>
Connectivity	£ 1.99	£ 2.10	£ 1.95
Competition	£ 0.20	£ 0.14	£ 0.11
Scarcity	£ 6.81	£ 16.72	£ 2.01
<b>Benefit / transfer passenger</b>	<b>£ 34.73</b>	<b>£ 17.89</b>	<b>£ 40.70</b>
<b>Number of OD passengers</b>	<b>170,569</b>	<b>178,719</b>	<b>166,400</b>
Heathrow	87,097	95,248	82,929
Gatwick	37,749	37,749	37,749
City	4,558	4,558	4,558
Luton	10,861	10,861	10,861
Stansted	30,304	30,304	30,304
<b>OD passengers constrained</b>	<b>164,124</b>	<b>164,124</b>	<b>164,124</b>
<b>Number of transfer passengers</b>	<b>38,028</b>	<b>29,877</b>	<b>42,196</b>
Heathrow	37,839	29,688	42,007
Gatwick	189	189	189
City	0	0	0
Luton	0	0	0
Stansted	0	0	0
<b>Transfer passengers constrained</b>	<b>22,272</b>	<b>22,272</b>	<b>22,272</b>
<b>Total passenger benefits (GBP mln.)</b>	<b>2,827</b>	<b>3,784</b>	<b>2,391</b>
UK	1,612	2,158	1,364
Non-UK	1,214	1,625	1,027
<b>Total benefits OD passengers (GBP mln.)</b>	<b>1,506</b>	<b>3,249</b>	<b>674</b>
Business	377	812	168
Leisure	1,129	2,437	505
Connectivity	333	360	323
Competition	34	23	18
Scarcity	1,139	2,866	333
<b>Benefits transfer passengers (mln GBP)</b>	<b>1,321</b>	<b>535</b>	<b>1,717</b>

Source: SEO Netcost

In the airline response 'hub carrier growth at Heathrow', we assume the transfer shares at Heathrow to be only 1 percent below the unconstrained level. This depicts a situation in which Oneworld operates a large hub operation at Heathrow with transfer shares comparable to other large European carriers.

Assuming lower transfer shares at Heathrow (second column of Table 1.7) the consumer benefit per OD passenger almost doubles. On the other hand, the consumer benefit per transfer

passenger halves. As the share of transfer traffic is lower, additional capacity is primarily used by OD passengers. Therefore, airfares for OD passengers decrease more strongly than fares for transfer passengers, resulting in higher benefits for OD passengers.

Conversely, when hub carrier growth at Heathrow is assumed to result in a higher transfer share the consumer benefit per OD passenger strongly decreases. In this case, only 2 million additional OD passengers are carried at Heathrow, compared to the 'do minimum' scenario. On the other hand, 20 million additional transfer passengers are served. Although the consumer benefit per transfer passenger is increases, total passenger benefits are lower when the transfer share is higher.

Table 1.8 Low Cost is King Scenario, Gatwick expansion, Gatwick becomes LCC gateway, results for 2040

Sensitivity test case	Gatwick becomes LCC gateway		
	Standard airline response	Transfers as in do-minimum case	Transfers above unconstrained case
<b>Heathrow</b>			
Transfer share ICA	45%	45%	60%
Transfer share EUR	40%	40%	50%
<b>Gatwick</b>			
Transfer share ICA	5%	0%	15%
Transfer share EUR	2.5%	0%	10%
Transfer share LCC (EUR & ICA)	10%	0%	15%
<b>Benefit / OD passenger</b>	<b>£ 34.12</b>	<b>£ 38.16</b>	<b>£ 24.33</b>
Connectivity	£ 6.42	£ 6.50	£ 6.45
Competition	£ 2.87	£ 2.82	£ 2.83
Scarcity	£ 24.83	£ 28.83	£ 15.06
<b>Benefit / transfer passenger</b>	<b>£ 1.29</b>	<b>£ 12.94</b>	<b>£ 26.11</b>
<b>Number of OD passengers</b>	<b>217,441</b>	<b>223,597</b>	<b>207,035</b>
Heathrow	73,117	73,117	66,778
Gatwick	88,020	94,177	83,953
City	6,285	6,285	6,285
Luton	15,793	15,793	15,793
Stansted	34,225	34,225	34,225
OD passengers constrained	185,299	185,299	185,299
<b>Number of transfer passengers</b>	<b>28,277</b>	<b>22,121</b>	<b>38,684</b>
Heathrow	22,121	22,121	28,460
Gatwick	6,156	0	10,224
City	0	0	0
Luton	0	0	0
Stansted	0	0	0
Transfer passengers constrained	25,262	25,262	25,262
<b>Total passenger benefits (GBP mln.)</b>	<b>6,907</b>	<b>7,515</b>	<b>5,784</b>
UK	4,187	4,555	3,506
Non-UK	2,720	2,960	2,278
<b>Total benefits OD passengers (GBP mln.)</b>	<b>6,871</b>	<b>7,801</b>	<b>4,773</b>
Business	1,839	2,088	1,278
Leisure	5,031	5,712	3,496
Connectivity	1,292	1,329	1,265
Competition	578	577	555
Scarcity	5,001	5,895	2,953
<b>Benefits transfer passengers (mln GBP)</b>	<b>36</b>	<b>-286</b>	<b>1,010</b>

Source: SEO Netcost

In the standard 'Gatwick becomes LCC gateway' scenario low cost carriers carry a small amount of transfer traffic. In addition, it is assumed that expansion of Gatwick will result in a shift of flights from Heathrow to Gatwick. As Heathrow flights are assumed to have a higher share of transfer passengers than Gatwick flights, the overall share of transfer passengers in the London airport system decreases due to this shift.

Table 1.8 summarises the changes in OD and transfer passenger numbers in relation to numbers when no additional capacity is built (the ‘constrained’ case rows in the table). If Gatwick were to be expanded the total number of transfer passengers in the London airports system would change depending on what shares of transfer traffic are assumed at Heathrow and Gatwick. The first column summarises the standard airline response path, which assumes low shares of transfer traffic at Gatwick (5% for intercontinental traffic (ICA), 2,5% for European network service and 10% for low cost carriers) and a relatively high share at Heathrow (45% for ICA, 40% for EUR). The second and third columns show assumptions and results for the low and high transfer traffic variants.

In the standard case and in higher transfer case, both the number of transfer passengers and OD passengers increase, resulting in benefits for both passenger groups. In the lower transfer case (middle column), the amount of transfer traffic decreases and more capacity is available for OD passengers. In the model, airfares in the OD markets are reduced to balance supply and demand. Because of the lower elasticity of OD passengers, the price decrease required to fill up capacity in OD markets is higher than the price increase in transfer markets. Therefore, aggregate consumer benefits are higher when transfer shares are lower.

Compared to the standard ‘Gatwick becomes LCC gateway’ airline response, the higher transfer variant results in 10 million less OD passengers. There is therefore less pressure on scarcity rents and as a result, the consumer benefit per OD passenger is GBP 10 lower than in the standard response case, and total welfare benefits are lower than in the standard case.





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