

Airports Commission  
Discussion Paper 03:  
Aviation and Climate  
Change – a response by  
Birmingham Airport

## Contents

---

1	Introduction.....	3
2	Do you consider that the DfT CO <sub>2</sub> forecasts present a credible picture of future UK aviation emissions? If not, why not?.....	4
3	To what extent do you consider that the analysis presented in this paper supports or challenges the argument that additional airport capacity should be provided?.....	5
4	How could the analysis be strengthened, for example to allow for the effects of non CO <sub>2</sub> emissions? .....	6
5	What conclusions should be drawn from the analysis of effectiveness, and relative cost, of airport capacity and other abatement measures in Chapter 5? Are there alternative analytical approaches that could be used to understand these issues? .....	7
6	What do you consider to be the main climate risks and adaptation challenges that the Commission will need to consider (a) in making its assessment of the UK's overall aviation capacity and connectivity needs, and (b) in considering site-specific options to meet those needs? .....	9

## 1 Introduction

---

Birmingham Airport welcomes the inclusion of climate change in the Airports Commission's considerations for assessing the need for additional UK airport capacity and how this can be met in the short, medium and long-term.

As a preamble to our response, whilst we note that the aim of the Paper is to open up debate around the issues of climate change, and not to reach firm conclusions, it appears that the discussion paper is not explicit in identifying the problem that the debate is seeking to resolve or consider. For instance, is the paper:

- a) Addressing the general principles of climate change, and taking it as a given that it is a necessity to respond to anthropogenic influences where they are proven or likely?
- b) Is it considered that the start point is one where the aim is to align with Government targets on emissions, and in particular CO<sub>2</sub>?

This distinction is important, as the approach to be taken to reach government CO<sub>2</sub> targets may be entirely different from the discussion to be had if the wider implications are to be considered.

Or, in other words, is the aim of the Commission to seek compliance with the Climate Change Act, or is it more general and wider-reaching than this?

For example, 1.1 makes direct reference to the relative importance of different emissions; if this is more than a consultation on CO<sub>2</sub> emissions, with a focus on achieving Government targets, perhaps the relative impacts of each emission type should be further examined, as interventions might be more effectively targeted elsewhere (see 1.4).

### **Birmingham Airport and Climate Change**

The paper largely considers the science of climate change and the global effect of climate change. This is entirely correct of course; global problems require global solutions. However, having said this, we also consider that there is an argument for every sector of the economy and of the specific aviation sector to “do its bit” to help the overall picture.

Birmingham Airport is committed to meeting the air travel needs of the Midlands region (and beyond) in an environmentally responsible way and acknowledges that whilst contributing only 2% to global emissions, air travel is growing and this growth is predicted to continue. The aviation industry in general is taking steps to minimise its CO<sub>2</sub> emissions and impact on the global environment. Efforts to reduce emissions require a collaborative approach between stakeholders including; airlines, airports and government; Birmingham Airport is signatory to Sustainable Aviation and has contributed significantly to the development of the CO<sub>2</sub> Road Map.

Birmingham Airport has been successful in working proactively in collaboration with both Air Traffic Control and Airlines to significantly reduce CO<sub>2</sub> emissions within the local airspace infrastructure and on the ground at the Airport.

- 2 Do you consider that the DfT CO<sub>2</sub> forecasts present a credible picture of future UK aviation emissions? If not, why not?
- 

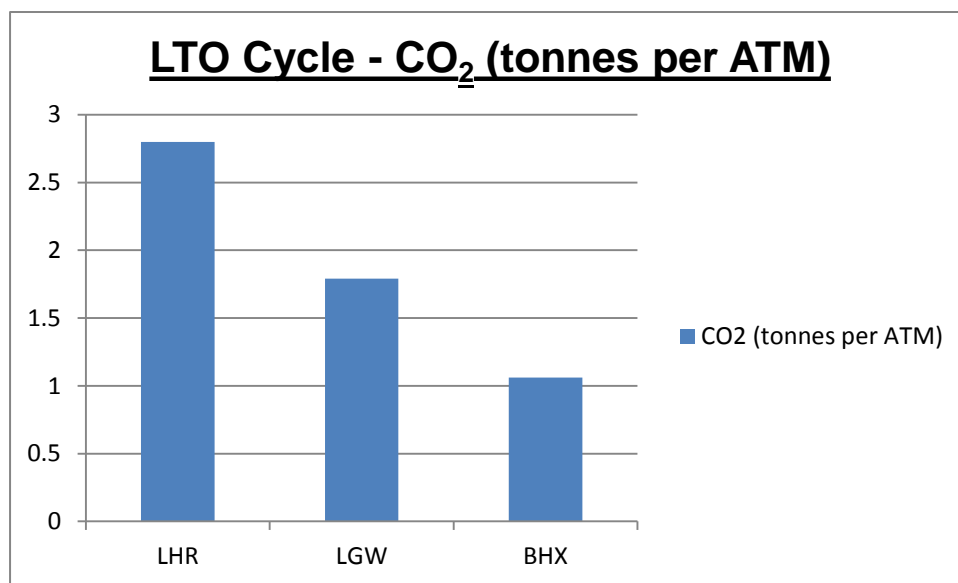
The document assumes that DfT forecasts and methodology as adapted to the Climate Change discussion are fit for purpose. Birmingham Airport raised queries over this, in discussion paper 1. A copy of our response to this is attached as Appendix 1 – our same concerns over the methodologies used for these forecasts are equally appropriate for the CO<sub>2</sub> emissions. For instance, the document assumes a status-quo in airline policy and no direction in terms of airports to be used, and the document appears to assume that discriminatory regulation remains in place, which encourages the over-use of London Heathrow without covering the costs of additional externalities.

3 To what extent do you consider that the analysis presented in this paper supports or challenges the argument that additional airport capacity should be provided?

In the short and medium term, making the most of spare capacity at existing UK airports would represent a reduction in emissions for the UK. In 2010 London airports accounted for almost 75% of total UK aviation CO<sub>2</sub> emissions (DfT UK Aviation Forecasts, 2011).

The already congested airspace arrangements within the South East provide a limited opportunity for airspace efficiencies or improvements, particularly with the issue of stacking around Heathrow. It is only natural that an airport running nearly at capacity will have significant issues in terms of air traffic management. Birmingham Airport has been successful in working proactively in collaboration with Air Traffic Control and Airlines to significantly reduce CO<sub>2</sub> emissions within the local airspace infrastructure and on the ground.

The graph detailed below highlights the inefficiencies of Airports in the South East which have developed and become congested; it can be assumed that any additional capacity added to the congested South East would only further worsen this problem and Birmingham Airport urges the Airports Commission to review the carbon cost of any further development in the South East.



*Source: data taken from LHR and LGW Carbon Footprints 2009. BHX data is taken from Carbon Footprint calculated for 2010/11*

It is also noted that some commentators consider that increasing capacity at Heathrow would eliminate the issue of stacking. However it is our understanding that the construction of a third runway at Heathrow would likely be filled very quickly – and therefore the issue of stacking, and the carbon inefficiencies this creates, would not be resolved at all in the long term.

4 How could the analysis be strengthened, for example to allow for the effects of non CO<sub>2</sub> emissions?

---

The inclusion of surface access emissions could strengthen the analysis. Birmingham Airport is in a position to alleviate the pressure on the congested airspace within the South East. This is both for emissions directly associated with Air Travel but also emissions from Surface Access, which we recognise is not covered by this paper. In this respect it should be noted that a substantial part of Birmingham Airport's natural catchment currently travels to other airports, principally Heathrow.

The Runway Extension Planning Application estimated that increased growth of Birmingham Airport and "clawback" of this catchment would result in a surface transport saving of circa 260million km and a resultant saving in CO<sub>2</sub> of 17,000 tonnes (at a passenger throughput of 27,189,000). In considering overall climate change impacts therefore, Birmingham Airport would encourage the Airports Commission to also consider the impacts of surface access journeys.

The most energy efficient scenario is one where the overall average surface access distance is also reduced. This supports the philosophy of a network of 'national airports' which serve their discrete catchments.

In addition to the above, an analysis of embodied energy versus emissions created by new build should be undertaken. Common –sense suggests that the use of existing infrastructure first, where the carbon cost is already incurred, will be more environmentally beneficial than new-build.

- 5 What conclusions should be drawn from the analysis of effectiveness, and relative cost, of airport capacity and other abatement measures in Chapter 5? Are there alternative analytical approaches that could be used to understand these issues?

At a local airport level, there are many ways in which airports can effectively reduce the carbon cost of their activities. In 2011 Birmingham Airport launched its 'efficient' airfield campaign, which aims to assist airlines in reducing emissions on the ground and in the air. This proactive approach aims to provide the most efficient airfield operation of any Airport both now and in the future.

Innovative solutions have been implemented and encouraged to reduce aircraft track miles and fuel burn for flights operating in and out of Birmingham Airport, as well as on the ground. A summary of these procedures can be found below:

- MOSUN arrival and departure – a 70 nautical mile reduction in track miles by flying through uncontrolled airspace, a unique routeing to/from Birmingham Airport.
- Eastern vector - a 7 nautical mile track mile reduction that directs arrivals to runway 15 via the eastern side of the airfield
- Continuous Descent Approach – the removal of level segments during approach decreasing fuel burn
- Continuous Climb Departure – the removal of level segments during departure reducing fuel burn during the period of flight at which the aircraft is least economical
- Continuous Taxi – the procedure of taxiing between the runway and stands without needing to stop and burn fuel whilst stationary
- Reduced engine taxi – shutting of 1 or more engines down upon arrival or during taxi out to the runway for departure
- Fixed Electrical Ground Power – the system in place to power the aircraft when on stand with the need for APU during temperate periods of the year
- Switch off of Air Conditioning Packs/Hydraulic Pumps – used to reduce the fuel burn during temperate periods of the year and when operational criteria allow.

The table below indicates the savings made by Birmingham Airport through these measures.

<b>Initiative Carbon Dioxide Savings Per Rotation (kg)</b>	<b>A321</b>	<b>RJ85</b>	<b>B733/735</b>
MOSUN Arrival	<b>611.90</b>	<b>2230.90</b>	<b>1338.54</b>
CDA	<b>127.48</b>	<b>159.35</b>	<b>95.61</b>
Continuous Taxi	<b>195.04</b>	<b>127.48</b>	<b>172.10</b>
Reduced Engine Taxi In	44.62	15.94	159.35
Reduced Engine Taxi Out	N/A	N/A	N/A
A/C Pack or Pump S/O	N/A	N/A	19.12
FEGP (Saving varies depending upon Stand Occupancy Time)	<b>414.31</b>	<b>254.96</b>	<b>210.34</b>
CCD	<b>318.70</b>	<b>N/A</b>	<b>347.38</b>
MOSUN Departure	1784.72	1227.00	1912.20
<b>Total Saving</b>	<b>3496.78</b>	<b>4015.62</b>	<b>4254.65</b>

Unlike some other Airports, Birmingham Airport's position is unique. The current under utilisation works as an advantage for future planning of an efficient airfield infrastructure and layout to ensure efficient aircraft routeing on the ground is maintained. Taxi times at Birmingham Airport can be as little as 90 seconds, meaning for less fuel burn and emissions and as the Airport grows, efficient aircraft routeings will be a major consideration.



- 6 What do you consider to be the main climate risks and adaptation challenges that the Commission will need to consider (a) in making its assessment of the UK's overall aviation capacity and connectivity needs, and (b) in considering site-specific options to meet those needs?

Clearly climate change will generate different climate and weather patterns and new ways to adapt to this will be required at UK airports. For instance, 2012 was the wettest year on record, despite the first few months of the year being dry enough to be considered a drought. All new and existing development will need to take into account these changing climatic conditions when planning for development and maintenance.

The Department for Environment, Food and Rural Affairs confirmed, by its approval of Birmingham Airport's Climate Change Adaptation Plan, that Birmingham Airport demonstrates that it is preparing for climate change and it has a good understanding of the challenges that climate change could pose, as well as monitoring climate change and assessing risks to inform future actions.

The Airport continually works with its partners to consider climate change adaptation measures; for instance the current works to develop the runway extension at the airport and divert the A45 dual carriageway has extensive engineering measures within the design to ensure surface water run off is captured and only discharged at greenfield rates, to avoid floods downstream of the airport, and new building development at the airport has been designed with integrated grey water recycling.

When discussing the location of, or site-specific options to meet the UK's overall capacity and connectivity needs, it should be noted that the construction of a new airport, distant from the majority of the population, will incur new CO2 embodied energy costs – both through the airport infrastructure and through new and bespoke surface access. For instance, a new airport in an estuarial location would increase the embodied energy of aviation and its surface access, as well as the average journey distance for the majority of the population. It follows therefore that the best location for any Airport must be one which maximises use of existing Airport and surface access infrastructure, and is easily accessible to the majority of the population.

It also follows that in if considering a 'single hub' scenario, the best place to site a hub would be one with existing surface access or whose future surface access could be shared with other economic activity. The greatest efficiency would be achieved were the above co-incident with the lowest average journey distance for the majority of the population; the demographics of the UK would point to a central location as being most environmentally beneficial.