



CAMCON AVIATION STUDY

MANAGEMENT REPORT

2008



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1. Executive Summary

Proposals to expand UK airports have long caused disputes between the government and green campaigners due to concerns over aviation's impact on climate change, local communities and the wider environment. However, plans to build a third runway at Heathrow and the government's decision to approve Stansted Airport's expansion, which could increase the number of flights at the Essex airport from 241,000 to 264,000 a year¹, has thrust the environmental debate surrounding aviation into the limelight.

With the European Union (EU) demanding that cities with populations of more than 250,000 produce digitised noise maps and the UK striving to meet the nitrogen dioxide (NO₂) limits specified in the EU air quality directive by 2010, the aviation industry is under increasing pressure to cut noise and toxic emissions pollution, as well as gain the support of an increasingly environmentally-conscious public. However, what does the public actually think about the growth plans for UK airports, how concerned are they and what can be done to allay their fears?

During August 2008, Camcon, the UK developer of the digital valve, commissioned a nationwide study of more than 2,000 people across Great Britain (GB) from leading online market research agency YouGov to examine these issues. Camcon's Binary Actuation Technology (BAT) can support the development of a new generation of quieter planes

The results of the Camcon Aviation Study 2008 throw some interesting light on 'green' Britons as, although worried about the impact of aviation on the environment, the population is unwilling to alter its travelling habits. In fact, UK adults place the onus of reducing aviation's impact on the environment firmly in the hands of airline operators and aircraft manufacturers. The research also reveals that the majority of the population remains unperturbed by plans to expand Heathrow and other UK airports.

This management report outlines the key findings of the Camcon Aviation Study 2008, provides detailed analysis of the results and outlines some key recommendations for airline operators and aircraft manufacturers to help gain the public's confidence, protect the environment and meet EU targets.

¹ <http://www.independent.co.uk/environment/climate-change/expansion-of-stansted-wins-noon-approval-956693.html>



2. Key Findings

2.1 Britons' green conscience takes flight with air travel

The study indicates that while green issues, such as climate change, noise and air pollution, worry almost three quarters (74 per cent) of the GB population, the majority are unwilling to alter their travelling habits in order to reduce aviation's impact on the environment. Only 22 per cent of people admitted that their concerns had affected the number of flights they take.

2.2 The majority of the population is unconcerned by airport expansion proposals

54 per cent of respondents stated that they were unconcerned by the growth plans for Heathrow and other UK airports. 41 per cent of adults also feel that UK airports require more capacity to meet flight demands.

2.3 Noise pollution was cited as the key cause for concern

67 per cent of GB adults surveyed cited noise pollution as the main reason for their apprehension about airport expansion. Climate change ranked in second place with 65 per cent, followed by air quality and impact on house prices with 60 per cent and 30 per cent respectively.

2.4 People expect airlines and aircraft manufacturers to protect the environment

The results revealed that of those who are apprehensive about expansive plans, 77 per cent of adults would feel far more comfortable about expansion plans if they knew that airlines and aircraft manufacturers were spending money on developing environmentally friendly planes.

2.5 Responses to a number of questions varied significantly depending on gender and region

Women proved to far more eco-conscious than men with 82 per cent expressing their concern over green issues, compared to 64 per cent of men. More than half (53 per cent) of women also had doubts about the planned airport expansions, compared to just 39 per cent of men.

Regional breakdowns revealed some interesting variations. For example, adults in the South West are the most concerned about green issues (80 per cent), while Londoners are the most apprehensive about the UK airport expansion plans (56 per cent). People in the East Midlands are the least willing to change their travelling habits (nine per cent).



3. Study Methodology

Camcon commissioned leading online market research agency YouGov to conduct a nationwide study, polling 2,023 adults across Great Britain (GB). The survey, conducted in September 2008, sought to examine:

- Attitudes of GB adults towards green issues
- Whether the public's concern about the environment was enough to dissuade them from flying
- Whether the public felt that UK airports required more capacity to meet flight demands
- How concerned GB adults were about proposed nationwide airport expansion
- What the key causes of concern were regarding airport expansion plans
- Whether the public would feel more comfortable about the plans if airlines and aircraft manufacturers invested money into developing environmentally friendly planes

The survey consisted of the following six questions:

Q1 How concerned are you by green issues such as climate change, air pollution and noise pollution? *Please pick one option only.*

- Very concerned
- Somewhat concerned
- Not very concerned
- Not at all concerned

Q2 Has your concern for green issues affected the number of flights that you take? *All adults who are concerned by green issues, please pick one option only*

- Yes – I fly less now
- Yes – I do not fly at all now
- Yes – Other
- No – it hasn't affected the number of flights that I make
- Not applicable – I never fly



Q3 To what extent do you agree or disagree with the following statement? *Please pick one option only*

'UK airports need more capacity to meet flight demands':

- Strongly agree
- Agree
- Disagree
- Strongly disagree
- Don't know/no opinion

Q4 How concerned are you by the proposed expansion at Heathrow and other UK airports? *Pick one option only*

- Very concerned
- Somewhat concerned
- Not very concerned
- Not at all concerned

Q5 Why do you say that you are concerned by the proposed expansion at Heathrow and other UK airports? *All GB adults who are concerned by the proposed expansions at Heathrow and other UK airports, please tick all that apply*

- It would increase noise pollution
- It would affect air quality
- It would contribute to climate change
- It would affect house prices in the surrounding area
- Other
- Don't know

Q6 To what extent do you agree or disagree with the following statement? *All GB adults who are concerned by the proposed expansions at Heathrow and other UK airports, please pick one option only*

"I would feel more comfortable about airport expansion plans if airlines if airlines and aircraft manufacturers were investing more money into developing environmentally friendly planes":

- Strongly agree
- Agree
- Disagree



- Strongly disagree
- Don't know/ no opinion

4. Results

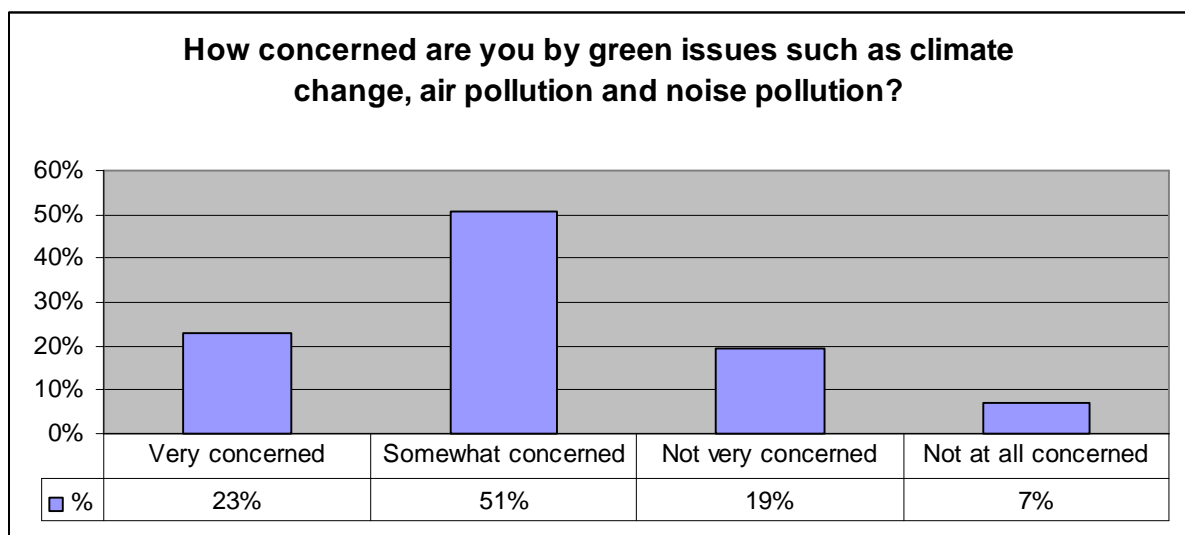
The results have been broken down into the key areas that the Camcon Aviation Study sought to examine:

4.1 Concern for the environment

The results show that almost three quarters (74 per cent) of people surveyed are concerned by green issues, such as climate change, air pollution and noise pollution. In terms of regional variation, respondents in the South West proved to be the most worried about the environment (80 per cent) while those in Wales proved to be the least concerned (70 per cent).

Women proved to be far more concerned about the environment than men, with 82 per cent admitting that they worry about issues such as pollution, compared to just 64 per cent of men. Regarding age group variations, respondents aged 18 to 24 proved to be the least anxious about green issues (69 per cent) and those aged 25 to 34 are the most alarmed (80 per cent)

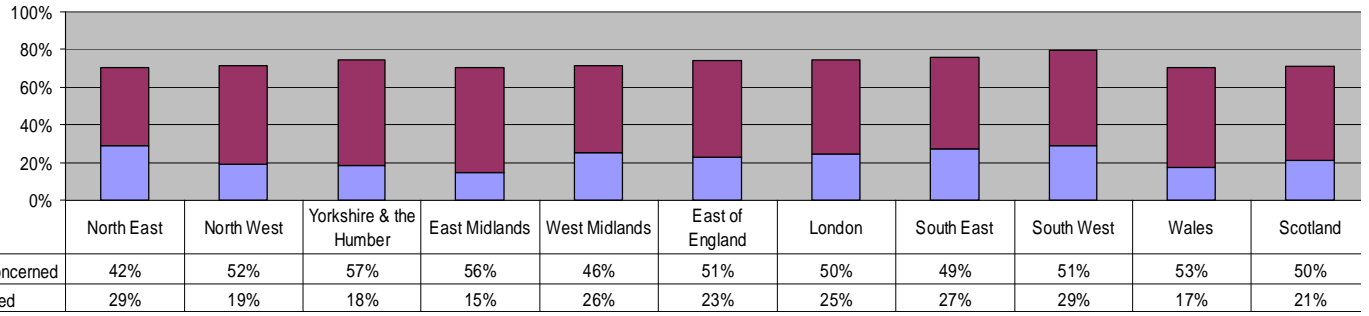
i. Nationwide sample





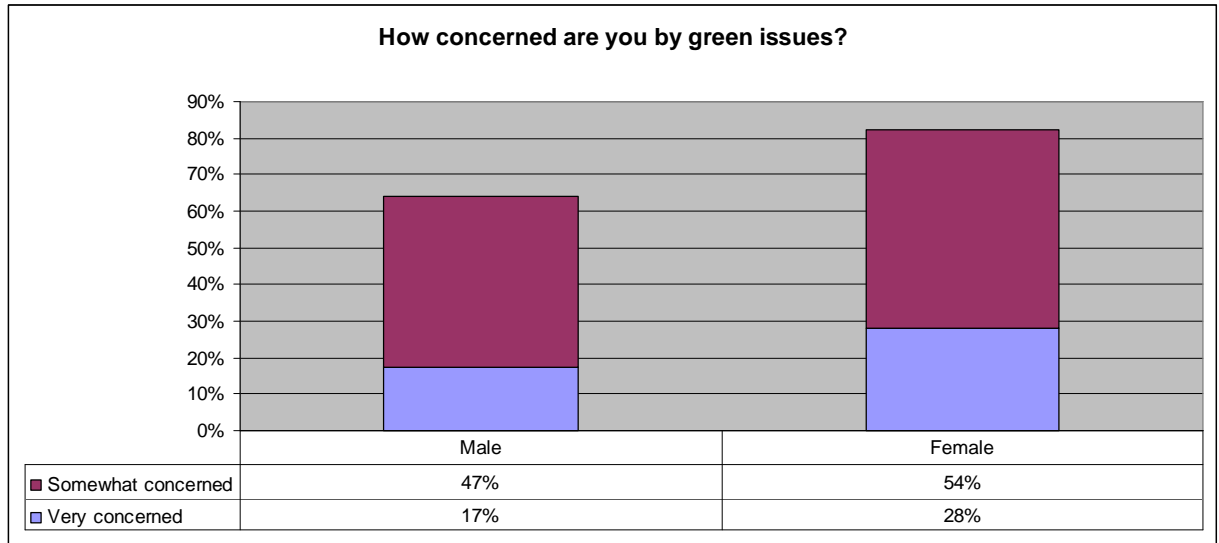
ii. Regional breakdown

How concerned are you by green issues?



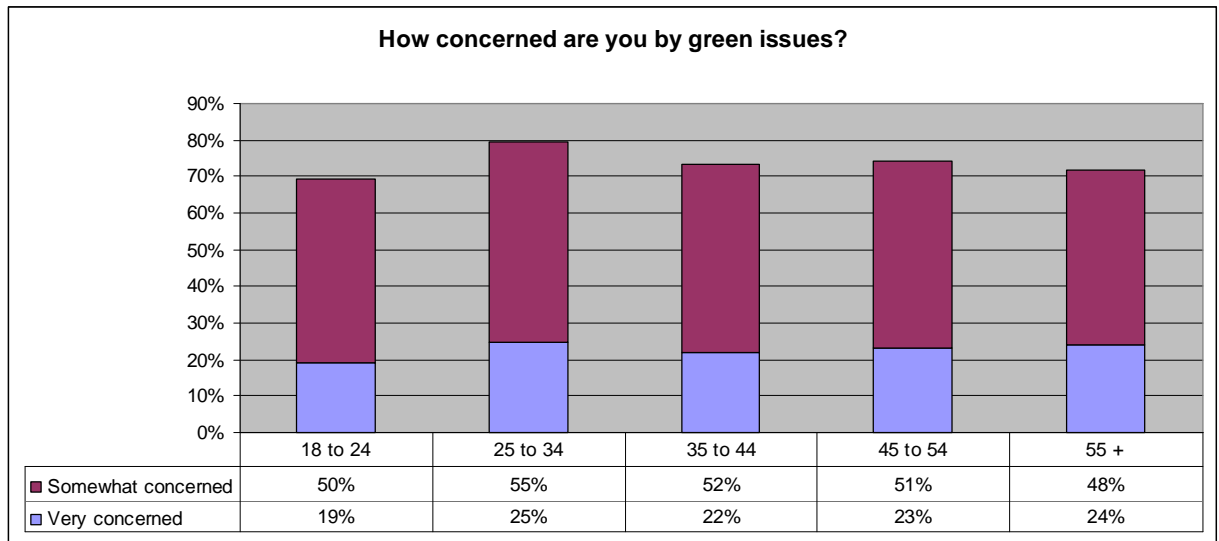
iii. Gender breakdown

How concerned are you by green issues?



iv. Age breakdown

How concerned are you by green issues?



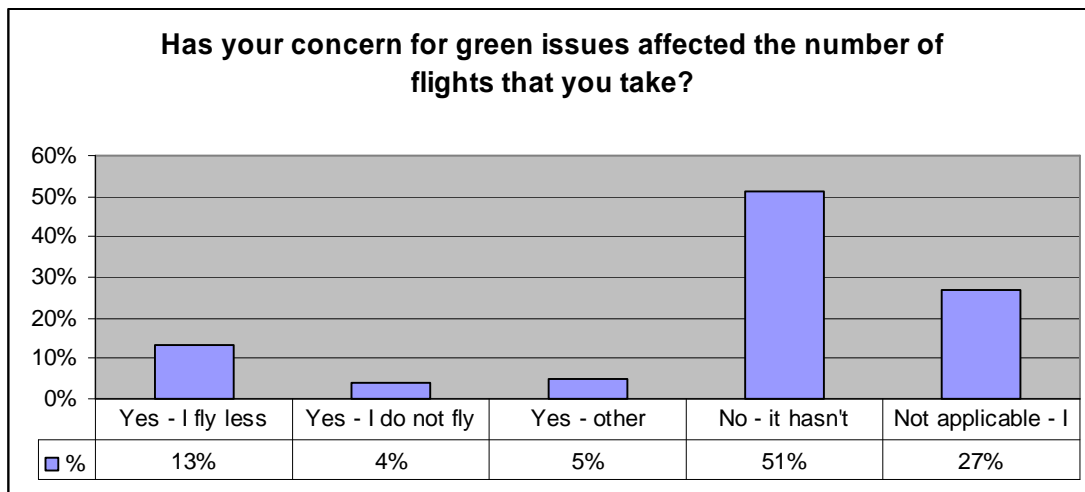


4.2 Influence of green concerns on travelling habits

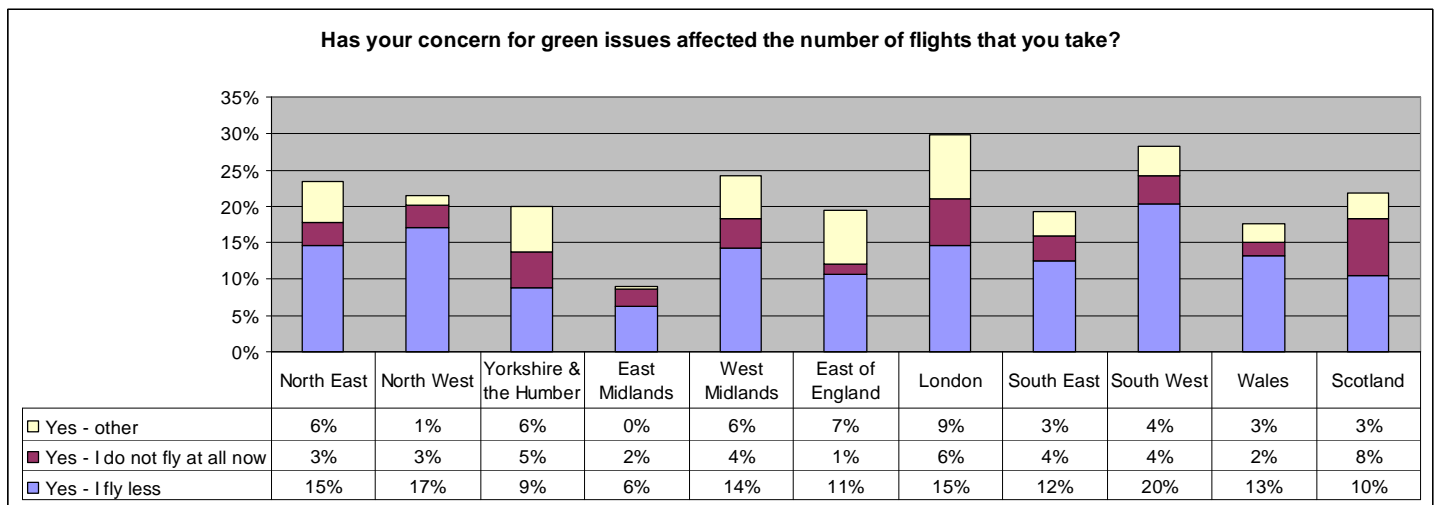
Although the majority of respondents expressed concerns about the environment, very few (22 per cent) admitted that their apprehensions had influenced the number of flights that they take.

While there were no significant variations in terms of gender or age, regionally responses differed considerably. Almost a third of Londoners (30 per cent) stated that their environmental concerns had affected the number of flights they take as did 28 per cent of respondents in the South West. However, only eight per cent of people in the East Midlands and 18 per cent of Welsh respondents have altered their flying habits.

i. Nationwide sample



ii. Regional breakdown





4.3 UK airport capacity

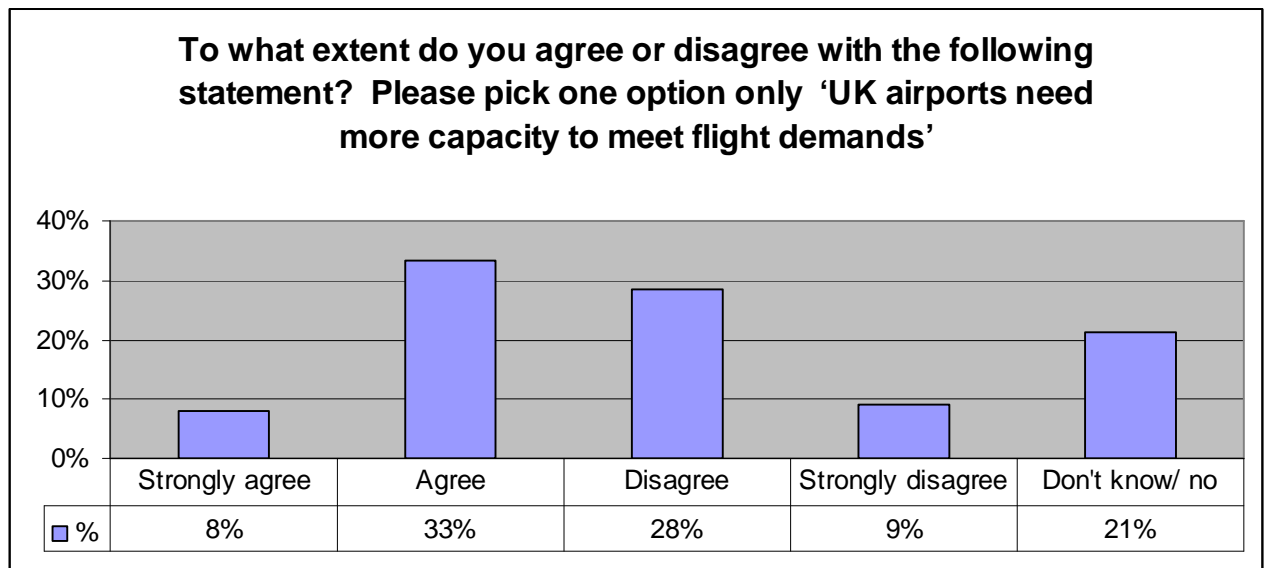
In this section of the study respondents were asked to what extent they agreed or disagreed with the statement “UK airports need more capacity to meet flight demands”.

On average, 41 per cent of people agreed with the statement. In terms of age, only respondents aged 45 to 54 significantly differed from the average, with just 36 per cent believing that extra capacity at airports nationwide was necessary. 21 per cent of respondents didn't know or had no opinion.

Regionally, almost half (48 per cent) of people in the North East feel that UK airports need more capacity, compared to just 37 per cent of respondents from Yorkshire and the Humber and 38 per cent of Londoners.

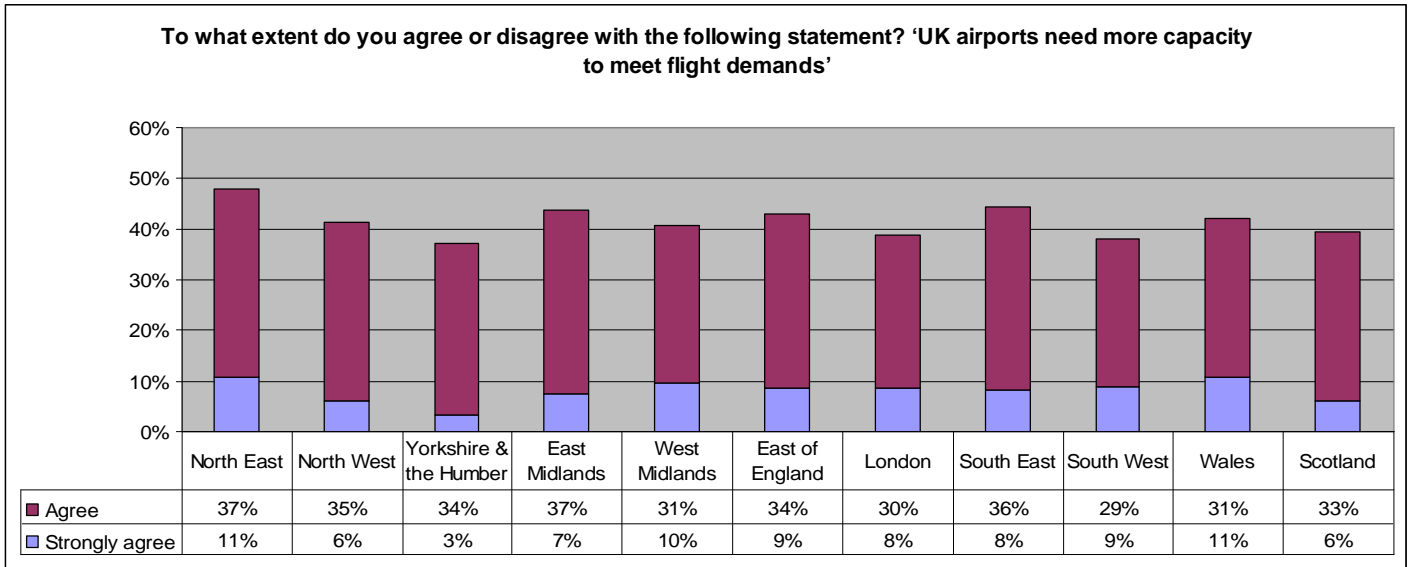
Regarding gender differences, almost half (49 per cent) of men feel that more airport capacity is required nationwide, whereas only 34 per cent of women felt the same.

i. Nationwide sample

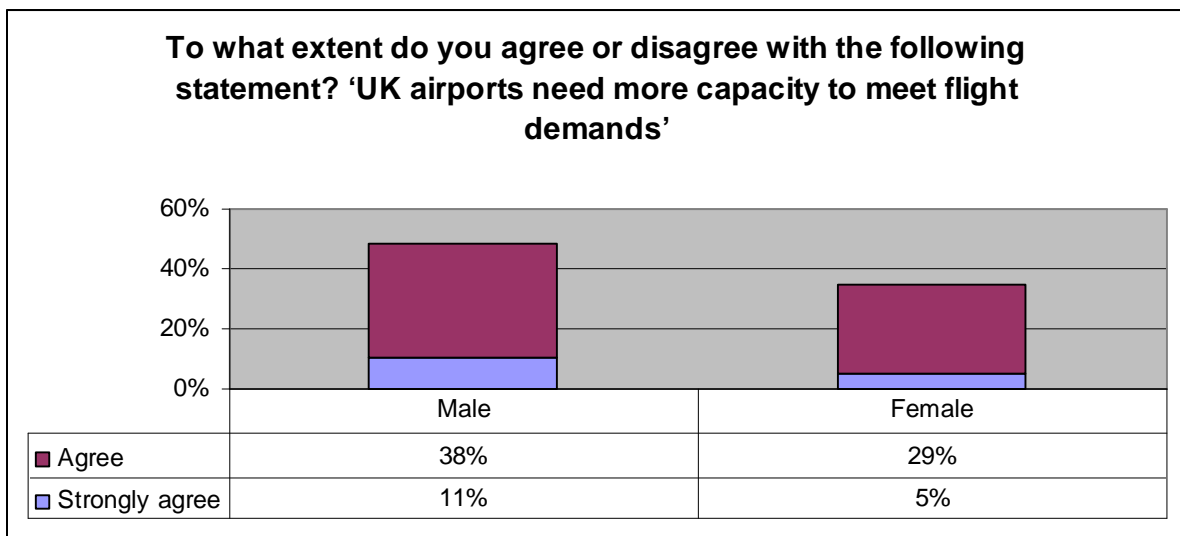




ii. Regional breakdown



iii. Gender breakdown





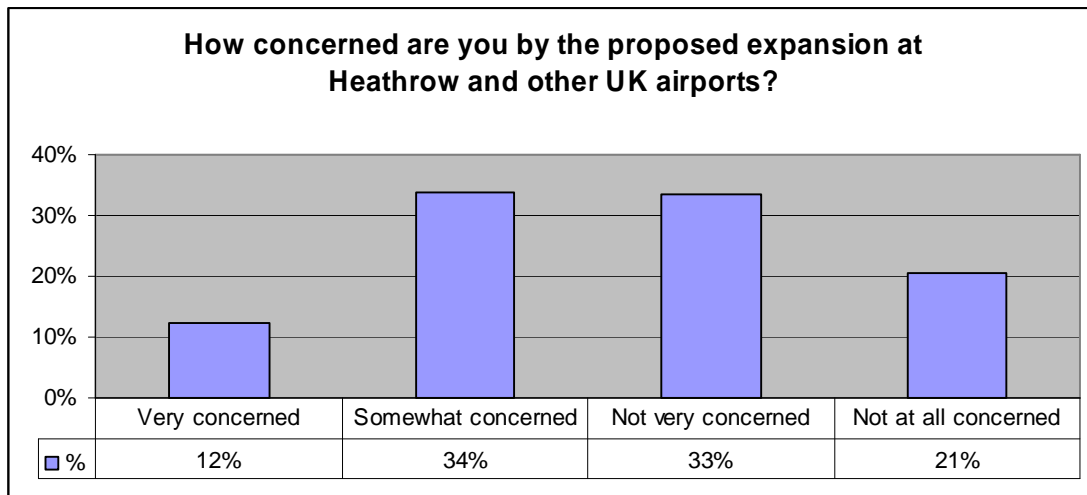
4.4 Level of public concern about nationwide airport expansion

When asked how worried they were about the planned expansion at Heathrow and other UK airports, more than half (54 per cent) of adults stated that they were unconcerned. Once again, there was a sizeable difference between male and female responses as only 38 per cent of men are concerned by the proposals, compared to 53 per cent of women.

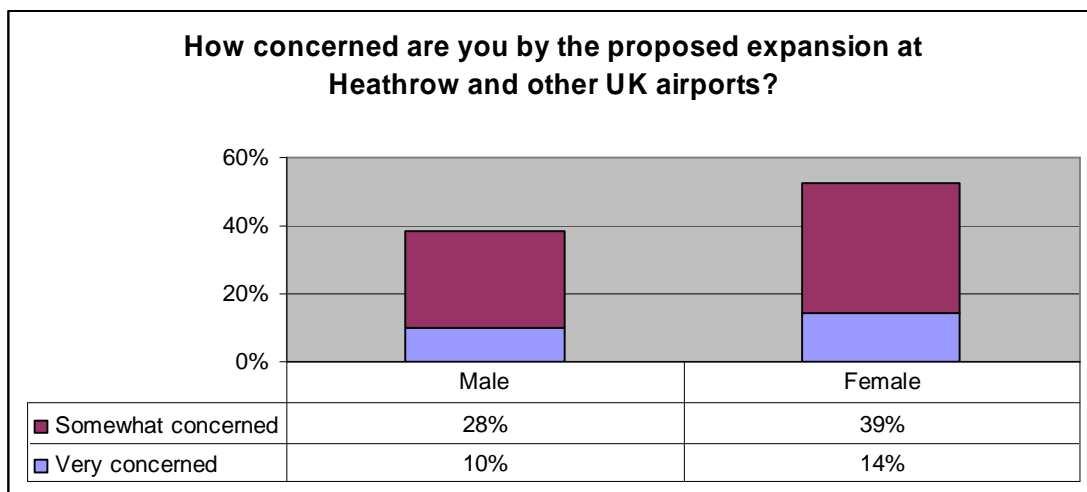
Regionally, people located in the South West and London are the most apprehensive about the expansion with 56 per cent. Respondents in the North East proved to be the least worried, with only 38 per cent admitting their concerns.

Apprehension over the proposed expansion appears to increase with the age of respondents.

i. Nationwide sample

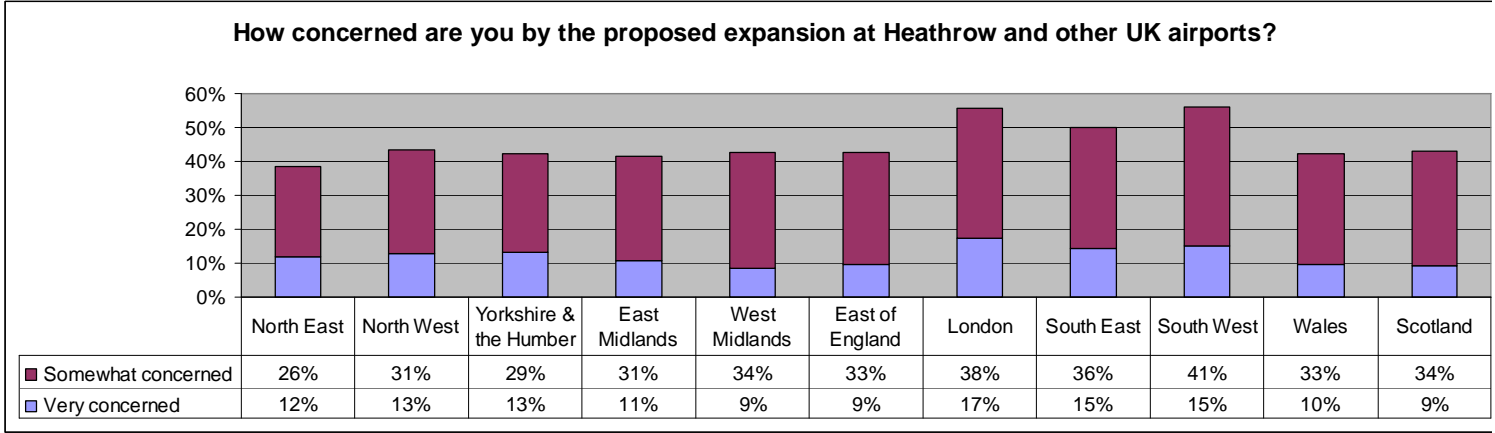


ii. Gender breakdown

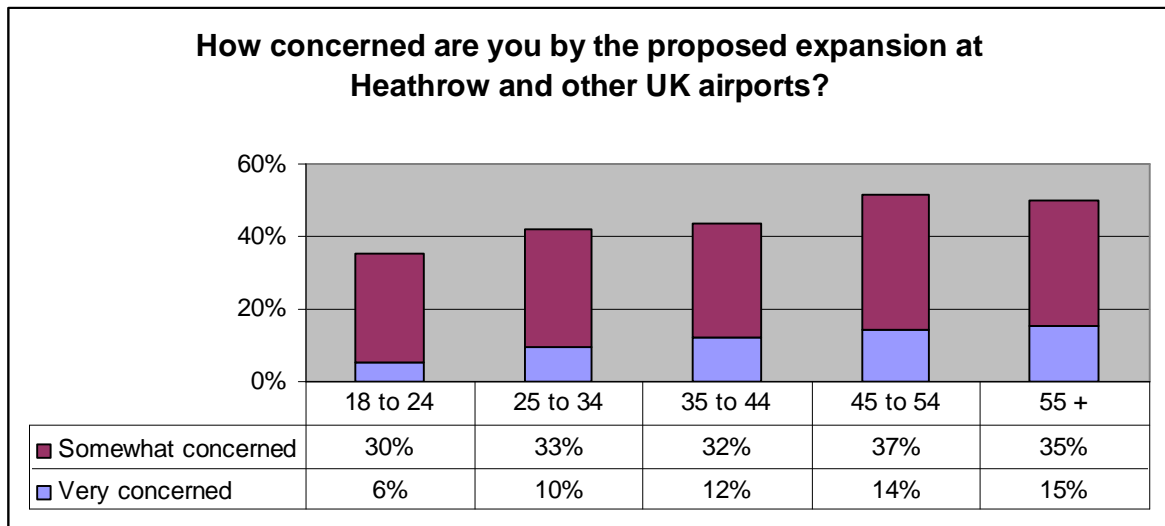




iii. Regional breakdown



iv. Age breakdown



4.5 Reasons for concerns

Respondents who had concerns about the proposed airport expansions were asked to select the reasons for their apprehension. Noise pollution emerged as the key factor, closely followed by climate change and air quality.

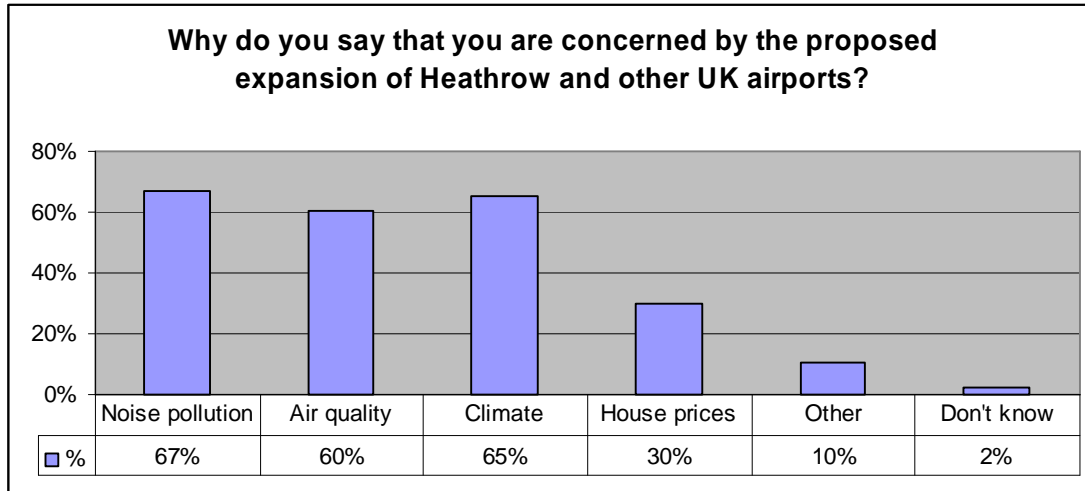
Almost a third (30 per cent) of respondents also fears that expansion would affect house prices in the surrounding area.

Regionally, people in the South West are the most concerned about noise pollution (78 per cent), with Londoners coming in closely behind on 75 per cent. People in the South East also cited aviation's affect on air quality as their key issue, while respondents from the North East are the most concerned about climate change (79 per cent).



Concerns about aviation’s impact on climate change decreases with the age of respondents.

i. National sample



4.5 Technology and environmentally friendly planes

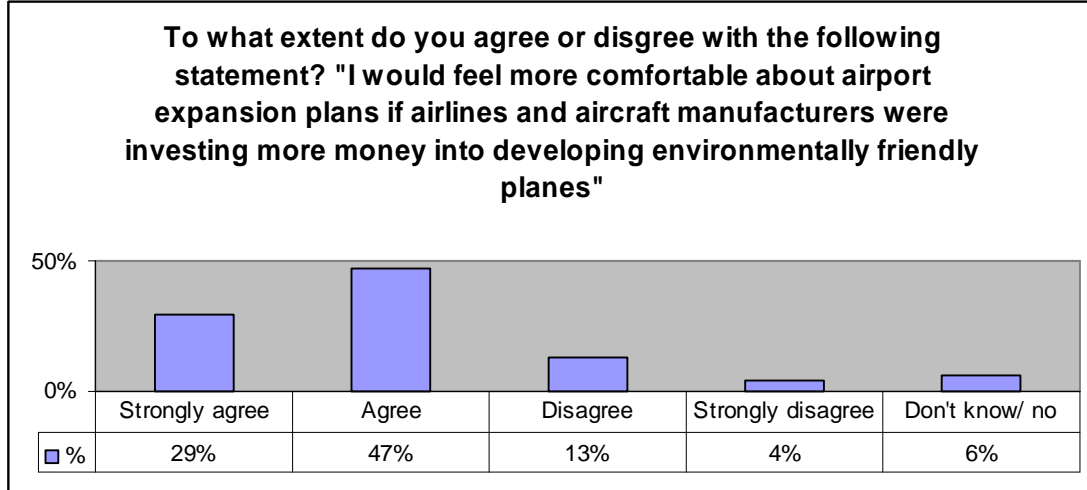
In the final section of the study, respondents who had concerns about airport expansion plans were asked to what extent they agreed or disagreed with the statement “I would feel more comfortable about airport expansion planes if airlines and aircraft manufacturers were investing more money into developing environmentally friendly plans”.

The vast majority (77 per cent) of the sample agreed with the statement and 18–24 and 45–54 year olds proved to be the biggest supporters of developing green planes (81 per cent and 80 per cent respectively).

Regional breakdowns revealed that people in Wales were the biggest advocates of investment in environmentally friendly planes (86 per cent), while the respondents from the East Midlands remained least convinced (65 per cent).

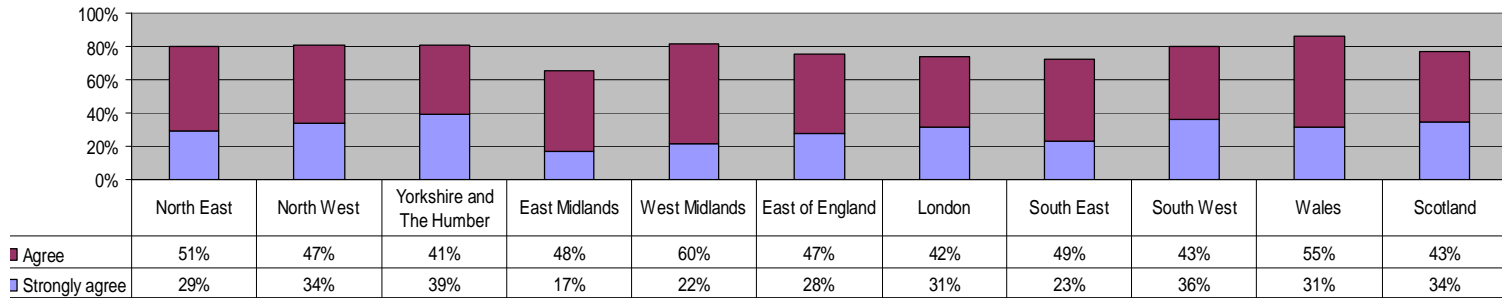


i. National sample



ii. Regional breakdown

To what extent do you agree or disagree with the following statement? "Would you feel more comfortable about airport expansion plans if airlines and airport manufacturers were investing more money into developing environmentally friendly planes?"





5. Recommendations

Camcon's Binary Actuation Technology (BAT) can support the development of a new generation of quieter planes and, in light of the study's results, the company has identified several factors that it believes are worth consideration:

- With consumers looking to airline operators and aircraft manufacturers to reduce aviation's impact on the environment, the industry needs to examine innovative technologies now available to reduce carbon emissions and noise. With regulations tightening and the EU placing pressure on airlines to cut emissions by three per cent in 2012², it is now time to look at technology
- As increased noise pollution is the key concern for adults that are apprehensive about UK airport expansion, aircraft manufacturers and airline operators need to show that they are trying to reduce noise levels from engine jets and fans, and landing gear. This will also give them the opportunity to differentiate themselves from their competitors and improve green credentials
- To gain public support for airport expansion plans, the government needs to provide more information on exactly how it will work with airline operators and manufacturers to ensure the environmental impact will be minimised and offset
- Further technology research should take place in this area

² <http://news.bbc.co.uk/1/hi/world/europe/7495567.stm>



6. Camcon background

Based in the UK's Silicon Fen, Camcon was founded in 2000 as a vehicle to support the development and commercialisation of a new class of binary actuating technology. The Intellectual Property (IP) company aims to make the Camcon Binary Actuator a worldwide standard and 32 worldwide patents have already been granted.

The high-speed, low energy consumption, low heat dissipation and long life characteristics of the Camcon Binary Actuator mean that it has applications in a range of industrial markets, including aviation, automotive, medical and oil & gas.

Regarding the aviation industry, Camcon's Binary Actuation Technology (BAT) can support the development of a new generation of quieter planes.

The company's development work in the aviation industry has been dominated by its participation in the Aircraft Noise Disturbance Alleviation by Novel Technology (ANDANTE) consortium. ANDANTE is a 36-month programme whose principal aim is the development of novel noise reduction concepts with application to low noise engine and airframe component design. Camcon's contribution to the programme was to work with consortium members to investigate active jet noise reduction using micro-jet technology and culminated in a comprehensive programme of jet noise tests, making use of a configuration of 16 Camcon, mid frequency valves.

In January 2008, the tests were conducted on a 1/10th scale model of a large engine exhaust nozzle in the presence of a flight simulation flow and static running. Jet noise reductions of approximately 1.5dB were measured using non-pulsating micro-jets. As non-pulsating micro-jets may require excessive amounts of air, which could compromise engine take-off performance, the micro-jets were also pulsed over a range of frequencies. The results revealed that for a number of micro-jet configurations at certain pulsing frequencies noise was reduced by around 1dB.

As the tests were carried out using non-optimised Camcon valves, where the flow rates and driving pressures were limited, a specific customised valve design may support further improvement on the noise reduction figure.



Camcon is funded by Hit & Run, the management team behind the Genesis rock band and ACUS Managing Partners, an active management venture capitalist that specialises in funding early stage technology companies.

In 2008, Lord Young took on the role of chairman and invested the capital that the company required to complete its current development programme and see the introduction of Camcon products into the market.



7. Contacts

For further information on the Camcon Aviation Study 2008 please contact:

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