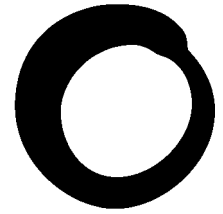


January 2008



**Friends of
the Earth**

Briefing

Heathrow expansion – its true costs

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Summary

The Government argues in its Heathrow consultationⁱ that economic benefits are the main reason for expanding Heathrow. It says “*Our work shows that a third runway at Heathrow would bring in net economic benefits of around £5 billion*”(p11), and argues that “*in the view of the significant potential economic benefits, there is a strong case for introducing further capacity at Heathrow*” (p15). The consultation presents this economic case as a given. However, this economic case is flimsy in the extreme. This briefing presents five main arguments why it should not be accepted.

In summary, the consultation misleads the public as to the benefit of extra capacity at Heathrow. Under more realistic assumptions, Heathrow expansion does not provide net economic benefits. Valuing climate change properly means expansion has net economic costs. The prime justification for expansion does not stack up.

Section 1 sets out the Government’s case for saying there are net economic benefits to expanding Heathrow.

Section 2 sets out the main areas of critique of these figures.

Section 3 sets out these arguments in detail.

Section 1 The Government’s case

The Government sets out the following economic benefits and costs for Heathrow expansionⁱⁱ:

Generated user benefit	+ £9 billion
Producer benefit	+ £5 billion
Government revenue	+ £3 billion
Climate costs	- £4.8 billion
Building costs	- £6.8 to 7.6 billion
Tourism	Positive, but not quantified
Other costs/benefits	- £0.3 billion
Total net economic benefit	+ £5.1 to 5.9 billion

“**Generated user benefits**” are the economic benefits to future passengers who will have chosen to take a flight in future because flying is cheaper with extra capacity. Because flying

is cheaper for them, they take a flight, which expands their consumer choices, this benefit is apportioned a monetary value using the economic theory Consumer Surplus Theoryⁱⁱⁱ.

Producer Benefit and Government Revenue are also calculated using this theory. These benefits are due to extra revenue to airport operators and greater tax revenue to Government from greater passenger numbers.

Climate costs are a monetary estimation of the damage caused by the additional emissions of greenhouse gases from aircraft using an expanded Heathrow.

Building costs are simply an estimate of the cost of building the runway and supporting infrastructure.

Other costs/benefits include issues such as monetary valuations of the damage caused by extra noise pollution.

Tourism costs are discussed – there are possible net benefits or costs depending on, for example, whether there will be more additional UK tourists going abroad than there are foreign tourists visiting the UK, and their relative levels of spending. DfT says these figures are uncertain, but says it is likely there will be a net benefit^{iv}.

All these figures are summed over the period 2006-2076, and expressed in 2006 prices.

Apart from the building costs these benefits and costs are all at least partially derived from assumptions about future demand for aviation, which are set out in new Air Passenger Demand Forecasts^v, but also on assumptions such as (for climate change) future plane fuel efficiency^{vi}, and new guidance from DEFRA on the monetary value to place on a tonne of carbon dioxide emissions^{vii}.

Section 2 - Five flaws in the Government's case

This briefing focuses on five main flaws in the Government's case

- It assumes that all benefits and all costs are of equal merit, irrespective of who gets them, and then obscures what are profoundly important ethical questions by reducing all impacts to a single monetary figure;
- It heavily underestimates the cost of climate change; **properly valued, the true cost of climate change is far higher, and using it, the net economic benefit of the whole expansion turns into a net economic cost.**
- Its demand forecasts are unrealistic, which gives heavy overestimates of Generated User, Producer and Government revenue benefits;
- Its sensitivity analysis is weak, giving a wildly over-inflated view of the precision of its estimates; and
- It claims that there will be a net benefit to the UK economy from tourism – but it is far more likely that the opposite will be the case.

We note that this is not an exhaustive list – there are other dubious aspects to the methodology, for example:

- The inclusion of benefits to foreign tourists in the “generated user” section, totalling many billions, when HM Treasury guidance says these should not be included^{viii};
- The assumptions for the costs of building the runway – such projects are prone to cost-overruns;
- The very low monetary values assigned to air pollution and noise. Air pollution is valued at zero, noise pollution at a maximum of £330 million summed over 70 years, with only the noise for the worst affected people accounted for^x. The noise value works out as compensation equivalent to the cost of a mars bar a day for the most affected households. Not that they will be compensated;
- The issue of whether the £3 billion “benefit” to Government revenue is genuinely a benefit – it is in reality a simple transfer from UK consumers to the Treasury. This figure comes from a theoretical model whose relevance to the real world is very questionable^x;
- The Government generates its benefits by comparing Heathrow expansion with an unrealistic “do-nothing” assumption, which would not hold in the real-world. This inflates the generated user, producer and Government revenue benefits. Expansion should be compared with an alternative strategy, such as restricting flights to say 90% of capacity to deal with delays, and a strong strategy to promote teleconferencing and improve rail links;
- The Government estimates delay reduction benefits at Heathrow, and monetises them^{xi}, but does no similar exercise for calculating and monetising the extra delays and carbon impacts from extra road congestion^{xii}; and
- Part of the climate costs appear to be counted as a benefit as well. The Government says that revenues from Air Passenger Duty should count as “*part of the aviation industry’s contribution to meeting its climate change costs*”^{xiii}. But the Government is also counting these same revenues as a benefit in its “economic benefit” section^{xiv}.

Section 3 Flaws in detail

3.1 IT MATTERS WHO WINS AND LOSES

A major problem with the net £5 billion pound figure is that it conveniently hides the issue of who wins and loses. The Heathrow expansion, in the Government’s own terms, is deeply regressive. The majority of the benefits are to “generated users” beyond 2030 who take additional flights. In other words, the benefits go to already very wealthy (in world terms) UK tourists getting a slightly cheaper flight. Summed over millions of flights over many decades, such small sums add up to an awful lot. In comparison, the vast majority of the costs will be due to climate change, which will overwhelmingly hit the poorest people and countries, those

least able to adapt to or prevent climate change impacts. These costs are not trivial (unlike a slightly cheaper flight) – they involve loss of livelihoods, increased risk of disease and death, loss of drinking water, and greater risk of catastrophic weather events. In other words the benefits are individually small, to already wealthy people, whereas the costs are individually very serious, to already very poor people. This crucial ethical issue should be openly debated, politically, but the use of this methodology effectively hides it behind one number, which the consultation is telling people to accept uncritically.

3.2 CLIMATE CHANGE IMPACTS ARE DOWN-PLAYED

Greenhouse gases like carbon dioxide and methane stay a long time in the atmosphere, ranging from decades to centuries. The damage from a tonne of carbon dioxide emitted now depends on what sort of future there is. If in future we have strong policies to stop climate change, a tonne of carbon dioxide emitted now will cause low damage. If in future we ramp up our use of fossil fuel, the cost of a tonne emitted now will be very large.

The Government's new guidance assumes that the world's Governments, including the UK, will put in place strong climate change policies which prevent the worst climate change damage. This leads them to use a figure of £19 for the damage from a tonne of carbon dioxide emitted now^{xv}. The figure assuming "business-as-usual" figure used in the Stern Review is £53 per tonne^{xvi}.

The clear danger with this £19 figure is that the Government guidance says this figure is to be used in all UK policy appraisal. Its use is therefore a driver of UK climate policy and UK climate emissions. Using a low figure means that climate change is given lower weight, and means that it is actively preventing the strong policies on climate change that are necessary to deliver the Government's assumption that the worst of climate change will be prevented.

This is circular reasoning of the worst kind – for example, if world Governments decided that it was even more important to stop climate change, then they would be assuming even less future damage, and so an even lower damage cost of carbon would be appropriate, making it even less likely that policies would be delivered to meet the Governments' intended goal. Using this policy approach of assuming a bright future actively prevents that future from happening. It is rather as if before a war, ministers said, "*We've looked into the future, and decided we're going to win. So we've factored that result into our plans and decided we don't need to spend any money on bullets or planes*".

It is far more appropriate and reasonable to assume a business-as-usual future, and ratchet down the damage cost as it became apparent that policies were actually delivering the carbon reductions needed to prevent climate change. Doing this means a more appropriate figure to use for Heathrow's extra climate costs would be £14 billion^{xvii}, £9 billion more. As the current estimate of total net benefits of the whole expansion is just under £6 billion, this £14 billion figure has the effect of turning the Heathrow expansion into a net cost of £3 billion.

This is not the only underestimate in the climate change costs. The Stern figure is itself an major underestimate for two reasons. First, it only includes monetary valuations for certain types of climate change impact. For example, damage to ecosystems such as coral reefs and rainforests are not valued, and there is a whole category of impact called "socially contingent effects" which is largely unvalued. "Socially contingent" effects are described by

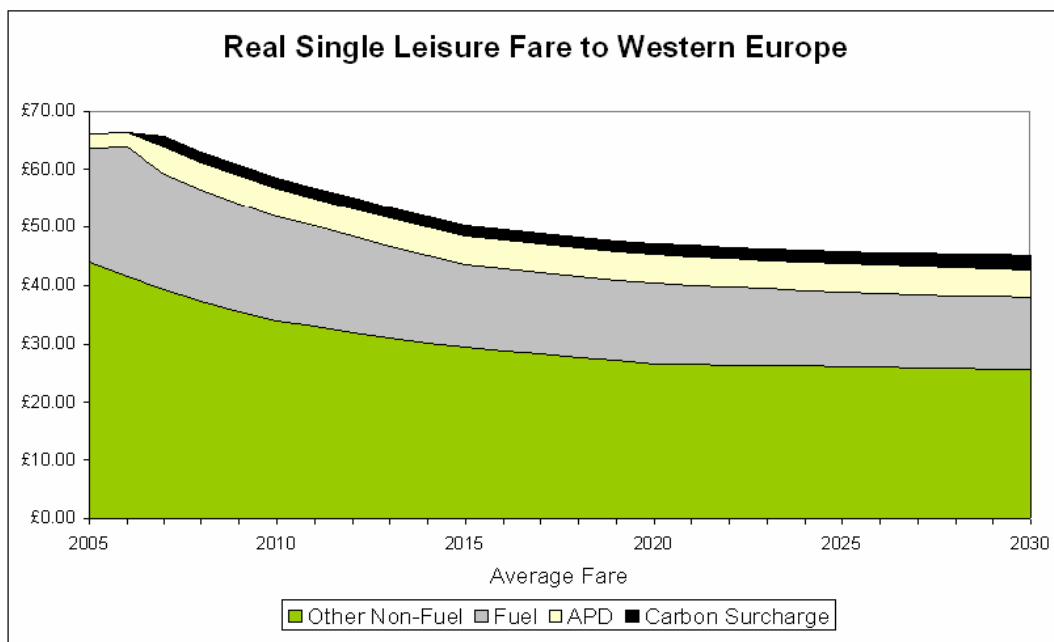
the Stern Review as “large-scale, ‘second-round’ socio economic responses to the impacts of climate change, such as conflict, migration and the flight of capital investment” (p150). The Stern Review is explicit that its values “given what is excluded...should be regarded as rather conservative estimates of costs” (p153). The recent DEFRA guidance also concedes this point, saying “the incorporation of socially contingent impacts of modelling would increase the social cost of carbon” (p9).

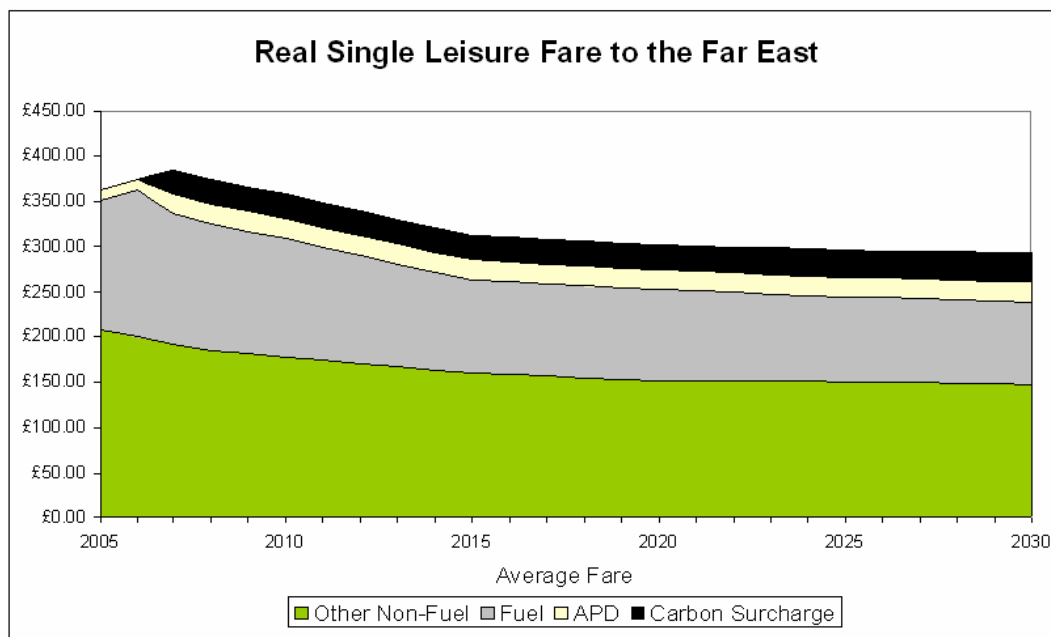
Second, the Stern Review figures are based on models based on science which is a number of years old. The model is cited as being from 2003, using science older than that. In recent years the science of climate change has moved forward, and it now accepted that the damage associated with given concentrations of greenhouse gases is likely to be a good deal higher than previously predicted. Given both these underestimates – on coverage of impacts and use of science, it would seem more realistic to use a far higher price than the given £53 figure in Stern, and more prudent, particularly given the Government’s commitment to the precautionary principle. A lower bound would seem to be around £100 at a minimum. This would make the overall climate change costs of Heathrow expansion over £25 billion, rather than the £5 billion given.

3.3 DEMAND FORECASTS ARE TOO HIGH

The Government’s most recent forecasts assume that UK demand for flying (already the highest per capita in the world) will increase from 228 million passengers per annum (mppa) to 480 mppa by 2030.

This result is a factor of many things, such as people’s future income, and the future cost of flying. The future cost of flying assumption in particular seems a huge underestimate – for example Figure B1 of the forecasts shows (see graphs below) that they are assuming that the real cost of both short and long haul flights will decrease by around 20% by 2020. This seems difficult to square with the reality of oil prices and the Government’s commitment to tackle climate change.





The DfT assume that oil price “falls from \$64 per barrel in 2006 to \$53 per barrel in 2030 with most of the decline occurring by 2012”^{xviii}. However at the time they published this report in 2007 the price was over \$90 and has since gone over \$100. Their oil price assumptions are not realistic.

Similarly, the carbon surcharge element of the above graph barely changes in 25 years. This is despite overwhelming evidence about the damage from climate change and the increasing political will to tackle it, largely through the price mechanism. It is also despite the signs that aviation will be included in a European wide emissions trading scheme which will be setting increasingly stronger caps delivering a larger and larger price for carbon permits. It also assumes that aviation continues with its largely tax-exempt status (it pays no VAT nor fuel duty) and that APD stays constant in real terms – it is difficult to see how much longer the sector can get away with this preferential treatment at the expense of other sectors of the economy who pay proportionately far more tax.

Different assumptions about the price of fares would give far lower demand projections – both removing the need for Heathrow expansion and also the economic justification for doing so – lower demand would have the effect of heavy reductions in the “generated user” and other benefits in the Government’s net benefit calculation.

3.4 OTHER ASSUMPTIONS TELL A DIFFERENT STORY

The Government attempts some sensitivity analysis – looking at whether different assumptions change the basic story^{xix}. There is an assumption that as people get richer, they will fly more – as has happened in the past. DfT rightly acknowledge that this link will weaken. They call this “market maturity”. They analyse this effect for many different

passenger types, and conclude^{xx} that “*the impact...is to reduce the central national forecasts by 18% in 2030*”. This is clearly a major impact, equivalent to around 100mppa. However this largest of impacts on the forecasts has had no sensitivity analysis. Different assumptions would change the overall demand figure greatly.

The climate change figure does have a sensitivity analysis – with a higher carbon cost demand falls by 5mppa. However the higher cost they model is only 20% higher (following DEFRA guidance). This is ridiculously small; there is greater uncertainty in the method DEFRA uses to work out how many dollars there are in a pound, before issues such as climate uncertainty, valuation difficulties and omitted impacts are considered. A far more realistic “higher” cost to model would be 400% higher, as outlined above. This too would have a major bearing on the demand forecasts.

Similarly, the GDP figure does have a sensitivity analysis, but at the very low rate of plus or minus 0.25% onto GDP growth projections. Assuming even 0.5% less would change the demand for aviation by 70 mppa, more than the Heathrow expansion.

Finally, the DfT analysis treats all of the possible different values independently – only one variable is ever changed at the same time. This is not a realistic real-world assumption.

The bottom-line is that the sensitivities and uncertainties in the demand forecasts are far greater than the DfT makes out. The 480 ppmv figure could with other equally plausible assumptions be a great deal lower. With lower demand forecasts all the generated user, producer benefit and Government revenue figures in the net economic benefit calculation are all lower.

3.5 THE UK ECONOMY WILL LOSE MORE THAN WIN FROM TOURISM

The Heathrow consultation claims^{xxi} that expansion “*may well generate net tourism spending to the UK. This would be between £0.4 billion and £3.2 billion*”. The opposite is far more likely.

The UK currently runs a major economic deficit from flying. There are far more UK tourists and business people flying abroad on holiday and working than there are foreigners coming to the UK. Overall, in 2004 foreign visitors arriving by air spent nearly £11 billion in the UK in 2004, but UK residents flying out spent £26 billion abroad – a loss to the UK economy of £15 billion pounds^{xxii}.

Net tourism deficit in future will depend on both net passenger numbers leaving the UK, and growth in spending.

For net passenger numbers, the difference looks set to increase. For example the DfT’s forecasts shows that UK business and leisure passengers at Heathrow would increase from 34m in 2005 to 64m in 2030, and foreign business and leisure passengers would increase from 17 to 35 million^{xxiii}. In other words, people going out increases by 30 million, people coming in increases by 18 million.

For growth in spending, the Government’s argument appears to be that it predicts that foreign tourist spending in the UK will increase far faster than UK tourist spending abroad. It bases this on an assumption that world GDP is growing faster (3.8% a year) than UK GDP (2.5%). However, this world figure is skewed by very fast growth in, for example, China and

India. But most foreign visitors to the UK do not come from China and India, they come from the USA and Europe, where GDP growth is similar to the UK.

The combination of these factors is that net passenger numbers out looks set to increase and relative spending will be largely constant, and so it is far more likely that overall the UK's already huge tourism deficit will increase – a further big hole in the “net economic benefit” conclusion.

Conclusion

The Government claims that there are net economic benefits to Heathrow expansion, with environmental and social impacts factored in. But more realistic assumptions and values give a very different picture. Climate change costs should be higher. Demand forecasts should be lower. Negative net impacts on UK tourism should be factored in. With these changes the net economic benefit turns into a large net economic cost. The Government's economic case, the prime justification for expansion, does not stack up.

Just as important though is that a policy appraisal method which blindly focuses on a single number stifles and obscures political and public debate around what are critical issues for UK society. Who wins and loses, what they win and lose, how to treat uncertainty, how to count impacts which have no easy monetary value - these are all central issues for good and effective policy making, but all of these issues are inherently and unacceptably degraded and ignored by a focus on a single number. We need a different, more open approach to taking decisions. The flaws in the Heathrow consultation need to spark a far-wider review and change to the Government's whole approach to policy-making.

Heathrow expansion – its true costs

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- i <http://www.dft.gov.uk/consultations/open/heathrowconsultation/consultationdocument/>
- ii Table 4.25 page 79 of DfT, 2007. Air passenger Demand and CO2 forecasts. November, DfT.
www.dft.gov.uk/pgr/aviation/environmentalissues/ukairdemandandco2forecasts/airpassdemandfullreport.pdf
and pages 125-129 of the main Heathrow consultation document
- iii Consumer Surplus Theory is explained in Annex H of DfT, 2007. Op cit.
- iv Main consultation, section 2.45
- v DfT 2007. Air Passenger Demand and CO2 forecasts.
www.dft.gov.uk/pgr/aviation/environmentalissues/ukairdemandandco2forecasts/airpassdemandfullreport.pdf
- vi See chapter 3 of DfT, 2007. Op Cit
- vii <http://www.defra.gov.uk/environment/climatechange/research/carboncost/pdf/background.pdf>
- viii Section 5.25 + note 4 of www.hm-treasury.gov.uk/media/3/F/green_book_260907.pdf, which says “All impacts (including costs and benefits, both direct and indirect) on non-UK residents and firms should be identified and quantified separately ...Generally, proposals should not proceed if, despite a net benefit overall, there is a net cost to the UK”
- ix Only noise over 57 dBA Leq is costed, despite Government guidance giving costs for noise change as low as 45 dBA Leq.
http://www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.2.htm#s5
- x Friends of the Earth has commissioned research on the validity of using Consumer Surplus Theory for transport appraisal, due Spring 2008.
- xi DfT, 2007. annex H 1.3
- xii DfT 2007. annex H 1.34
- xiii DfT , 2007 section 2.32
- xiv DfT, 2007. Annex H.
- xv In 2000 prices.
- xvi Stern actually used £65, but DEFRA are using a different methodology from Stern for converting dollars to pounds – the original research gave a price in year 2000 dollars. £53 is the figure DEFRA give for Stern using their conversion methodology.
- xvii Multiplying the existing £5 billion figure by 53 and dividing by 19.
- xviii DfT 2007, section 2.29
- xix – see page 39-42 of the forecasts.
- xx Annex B Section 1.27 of DfT 2007, op cit
- xxi Page 146
- xxii These figures come from Government and civil aviation authority data, referenced at http://www.foe.co.uk/resource/briefings/regional_tourism_deficit.pdf
- xxiii DfT, 2007. Table G2 page 111