




air travel
tax and the
environment
the facts



The role of aviation within sustainable economic and environmental policy development is currently the subject of intense debate. The issues which it encompasses will have a major impact not just for the UK aviation industry, but on the economic, social and environmental well-being of the nation as a whole. This document attempts to identify some of the key issues framing that debate, and to provide a balanced analysis of the various factors that underpin them.

Air transport accounts for only a small proportion of greenhouse gas emissions, both globally and within the UK, though this figure is rising.

- Over a comparable journey, air travel takes less land and affects a smaller area by noise along its whole route than cars or trains.
- It produces fewer local emissions than car or diesel trains per passenger km. Beyond 400 km, air travel produces fewer carbon dioxide emissions than a one-person car.

- It is the least subsidised form of public transport. And while other forms of public transport are subsidised, air passengers pay some £1 billion a year in Air Passenger Duty.
- The aviation sector also pays for its own infrastructure: terminals, runways and aircraft.

Freedom to Fly believes that all industries, including aviation, should cover the known and verified net external costs of their operations, on a fair and equitable basis. We also accept that Government has an obligation to balance the needs of passengers, the economy, society and the environment.

This equation must also take into account the economic benefits of air links – aviation contributes over £10 billion a year to the UK economy, generates half a million UK jobs and adds to the competitiveness of UK industry, tourism, trade and inward investment.

Moreover, air travel has widened the horizons of the British public. Nine out of ten Britons have flown – it is no longer something for the privileged few. The social benefit we gain from the ability to visit friends and relatives, have a holiday in the sun, experience other cultures or study abroad explains why the British public want to travel more in the future.

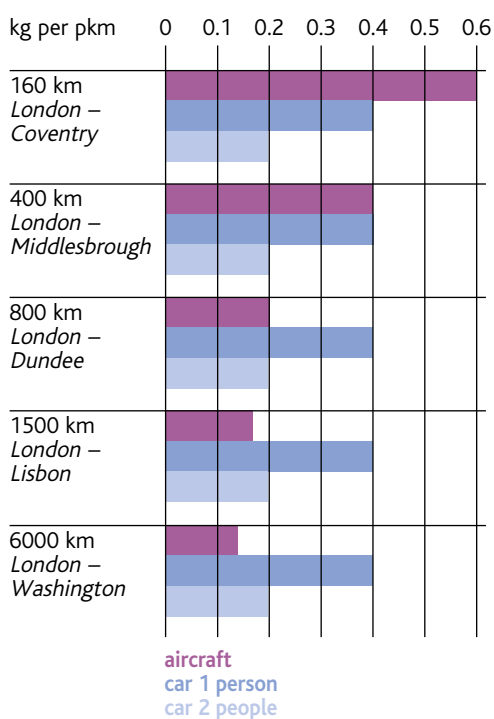
Fundamentally, Freedom To Fly believes that Government and industry must aim to maximise the economic and social benefits of aviation while mitigating harmful effects and environmental costs.

Nine out of ten Britons have flown – it is no longer something for the privileged few

Issue 1 Aviation and the environment

Key fact Aviation accounts for only 2% of global carbon dioxide emissions¹, far less than emissions coming from road transport (18%) and power stations (34%). UK domestic flights account for 0.5% of UK emissions², much less than the 21% coming from road transport and 26% from power stations³

The specific CO₂ emissions of air transport decline according to distance. From 400 km, air transport CO₂ emissions per passenger kilometre are lower than those of a single occupancy car source: Infrans (2000)



It is sometimes claimed that air travel is more polluting per passenger kilometre. In fact, per passenger kilometre on a similar journey, a car emits more carbon dioxide than a plane beyond 400km (one person car) or 800 km (two person car).

There is no single measure of a 'most polluting' emission. Carbon dioxide is the main 'greenhouse gas' thought to contribute to global warming. Diesel cars are more fuel efficient than petrol cars and therefore produce less carbon dioxide but emit more 'particulates'.

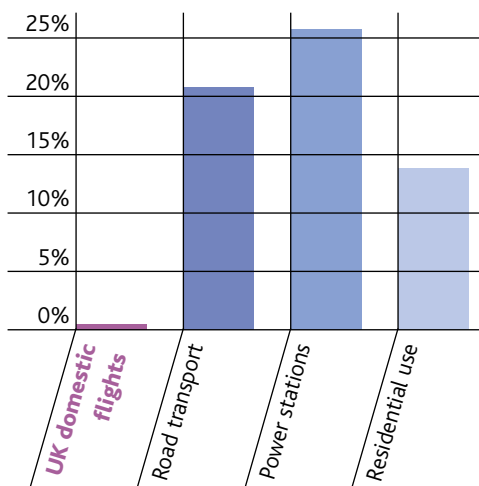
For example, nuclear generated electricity emits far less carbon dioxide than fossil fuel electricity but leaves radioactive waste which may take thousands of years to become safe. But electricity generated from fossil fuels produces a quarter of the world's man-made carbon dioxide emissions.

It is sometimes claimed that CO₂ emissions from air transport may rise to account for up to 15% of world emissions in fifty years' time. In fact the IPCC examined a range of projections from as little as 3% to as much as 15%. **The IPCC's central projection was that aviation may account for 6% of global emissions by the year 2050.**⁴

The science of the impact of high-level flight especially the impact of water vapour remains very uncertain (as was made clear by the IPCC⁵) and airlines are co-operating in scientific research programmes. According to the IPCC, the total 'radiative forcing' of air travel was calculated to be about 2.7 times that of carbon dioxide alone. Other activities may have a factor typically of 1 to 1.5. Still this is a small proportion of overall radiative forcing. The principle of sustainable

Planes have been improving their environmental performance and will continue to improve in the future

UK Carbon Dioxide emissions by source
 source: ENC (2001) The UK's Third National Communication under UNFCCC



For many journeys, there is no realistic alternative to a plane (e.g. Manchester to Majorca, London to New York)

development rejects the idea that any increase whatsoever in environmental impact is unacceptable and that economic and social development must suffer as a result. It is neither efficient nor fair for all countries and all industries to reduce emissions at the same rate – indeed optimally some will increase, while others decline.

Planes have been improving their environmental performance and will continue to improve in the future. **Fuel efficiency of aircraft per passenger kilometre has increased by 50% over the last 30 years.**⁶

Corridor studies (published by the international Air Transport Action Group/ United Nations Environmental Protection and the UK's Commission for Integrated Transport) show that comparisons between different modes of transport on a similar route are very mixed. **Compared with a one person car, aviation produces less CO2 per passenger kilometre beyond a distance of 400 km.**⁷ Over its whole journey, a plane affects fewer people by noise than a train or car.⁸ A comparison with high speed trains depends on whether trains are diesel powered or use electricity from fossil fuel power stations or nuclear electricity. A plane emits less SO₂ than a UK high speed electric train and less PM₁₀ ('particulates') than a diesel train per passenger kilometre.⁹ Trains account for less CO₂ if a large proportion of the power comes from nuclear generated electricity (as in France and Germany). But nuclear power has its own environmental problems.

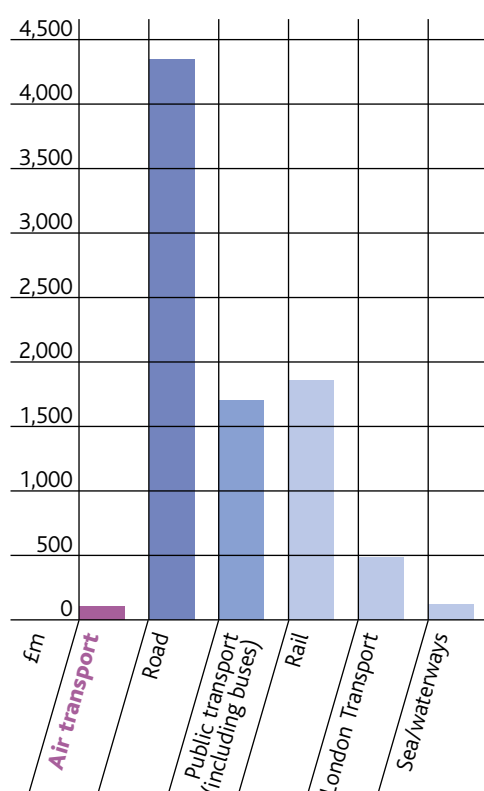
Air travel also takes up far less land than ground transport per passenger. **Air travel takes one fifth of the land used by car and one seventh of the land used by an intercity train per passenger kilometre.**¹⁰

And of course it will sometimes make sense to take a form of transport even if it causes more emissions, for reasons of accessibility and time (e.g. going by bicycle from London to Birmingham would cause fewer emissions than going by train). For many journeys, there is no realistic alternative to a plane (e.g. Manchester to Majorca, London to New York).

Issue 2 Aviation subsidy

Key fact Aviation is the least subsidised form of public transport

Public expenditure on transport 2001/02
source: ONS Transport Statistics GB 2002 – Central and local government expenditure on transport 1998/99–2001/02



According to official Government figures, total central and local government public expenditure on transport over the last four years was £35,900 million, nearly all of which was spent on roads, rail, bus and tube. Of this £35,900 million, only £199 million was spent on air transport (including support for Scottish Highlands and Islands lifeline services).¹¹ **In contrast to roads and rail, airports and airlines pay for their own capital expenditure (£12.5bn over 5 year period).**¹²

It is true that there is no tax on aviation fuel in accordance with international agreements. Other forms of public transport are treated comparably, for example there is no fuel tax for shipping, only 3p a litre 'red diesel' rate for trains (which are also exempt from the climate change levy) and buses get Fuel Duty Rebate.¹³

Zero rated VAT applies to all forms of public transport: air, rail, bus, ship, tram or underground.¹⁴ Moreover, air passengers pay about £1bn per year in Air Passenger Duty.¹⁵ Asked about applying a fuel tax and VAT to air travel, David Jamieson MP (Parliamentary Under Secretary of State for Transport) said: 'Imposing a tax on aviation equivalent to the current rate of duty on unleaded fuel in the UK has not been considered in ICAO and the Government has given an undertaking not to remove existing zero rating for VAT purposes of air transport. Imposing such tax increases on aviation would consequently go well beyond what is justified on the basis of evidence of its environmental costs.'¹⁶

The best current UK research published by the Government (based on a study by Pearce and Pearce) reckoned **aviation's external environmental costs are broadly equivalent to annual Air Passenger Duty, about £1 billion p.a.**¹⁷ The Government's consultation documents¹⁸ say that imposing an additional environmental tax to cover rising greenhouse gas costs (equivalent to 100% fuel tax) could add 5–10% to the cost of an air ticket by year 2030. This is already taken into account in the Government's central forecasts.

F2F considers that the best way to limit greenhouse gases from aviation is an open international 'emissions trading' system, where airlines (like other industries) are allocated a maximum cap on allowed emissions – then if they overshoot it they have to buy credits from other airlines or other sectors; if they beat it they can sell their surplus. A climate change trading scheme is credible but would undoubtedly be superior to a blanket tax. In the USA, an emission trading system reduced

	Air	Train	Bus
Passenger km in billions pa	7.7	47	46*
VAT	No	No	No
Fuel tax	No	3p (red diesel)	Fuel Duty rebate
Passenger Duty/VED	Yes £1bn pa	No	No

sulphur dioxide emissions in half, at half the cost of an across-the-board restriction.¹⁹ The IPCC has stressed the desirability of stabilising concentrations of greenhouse gases in the atmosphere towards the second half of this century. To meet such a stringent aim it is important that the environmental results are achieved in the most economically efficient way possible.

Issue 3 External costs of aviation

Key fact The Government's own assessment confirmed UK aviation's external environmental costs such as greenhouse gas emissions, noise and nuisance amount to be £1 billion pa (i.e. about £3 per short haul passenger and about £20 per long haul passenger, broadly equivalent to current annual Air Passenger Duty).²⁰ This external cost may eventually rise to 5–10% of air ticket prices by 2030 according to the Government's recent consultation documents.²¹

Industries should take account of the known net external costs of their operations, on a fair and equitable basis

A briefing paper by anti-aviation group Airport Watch estimated the current external costs of UK aviation as high as £3bn pa (an exaggerated figure in our view). But they admitted that **even if air passengers paid a new 20% tax to cover all these external costs, causing a 18% drop in demand, Britain would still need two new runways in the South East.**²²

Freedom to Fly accepts that industries, including aviation, should take account of the known net external costs of their operations, on a fair and equitable basis. **The Government's own study shows aviation's external environmental costs are around £3 per passenger on short-haul flights and £20 per passenger on long-haul flights. This is already broadly covered by Air Passenger Duty (approx. £1 billion pa).**²³

There are also strong positive economic and social external contributions from aviation, on top of the direct contribution of £10.2 billion per annum to the UK's economy and 180,000 jobs, which need to be weighed in the balance.

In his pre-Budget report of November 2002, the Chancellor of the Exchequer states that: 'The Government recognises both the important economic benefits that aviation offers and the need to ensure that the industry faces an appropriate set of economic incentives to deliver an efficient environmental outcome'.

Issue 4 Aviation capacity

Key fact On the Government's own figures, 73 million passenger journeys a year will be lost to the UK air system if there is no increase in runway capacity in the South East by 2030.³⁵ Even environmental pressure group Friends of the Earth have stated they now accept the need for a 'reasonable level' of aviation growth.³⁶

Roads are built at public expense and there is generally no marginal cost on the driver to use them. Runways and terminals are built by airports who must recoup the cost ultimately from passengers who pay each time they fly. The consultation is not, therefore, the prelude to a 'predict and provide' policy, but aims to enable airports, investors and airlines to plan for new capacity. On the contrary, at airports like Heathrow, capacity is already far less than demand. The alternative to additional capacity is to price people out of flying and damage the economy.

Some groups, such as Friends of the Earth, have argued that demand could be managed by imposing an environmental tax, a fuel tax and VAT. But on their own figures, this would increase air fares by a minimum of 42%, or add up to £200 to the cost of air travel to each family in the UK.

There are also real fears about the impact of unilateral demand management on UK competitiveness. Competitor airports such as **Paris Charles De Gaulle and Amsterdam Schipol have already stated publicly their desire to usurp London's position as the pre-eminent European and trans-continental aviation hub.**

It is also suggested that 'it would be possible to cater for rising demand by expanding regional airports only'. However, **over 80% of passengers using South East airports originate from, or are travelling to the South East.** Few would use regional airports instead – many would be more likely to travel via Paris or Amsterdam to access destinations they could no longer reach from London.

People want to fly from an airport near to home where possible and airports in all of the UK's regions will have to rise to the challenge of sustainable growth. Regional airports will be busy catering for their own regional demand. However, **demand in the South East is forecast to rise from 114m passengers pa in 2000 to 300m pa in 2030. It is clear that growth of this scale could not be absorbed into airports in regions outside the South East.**

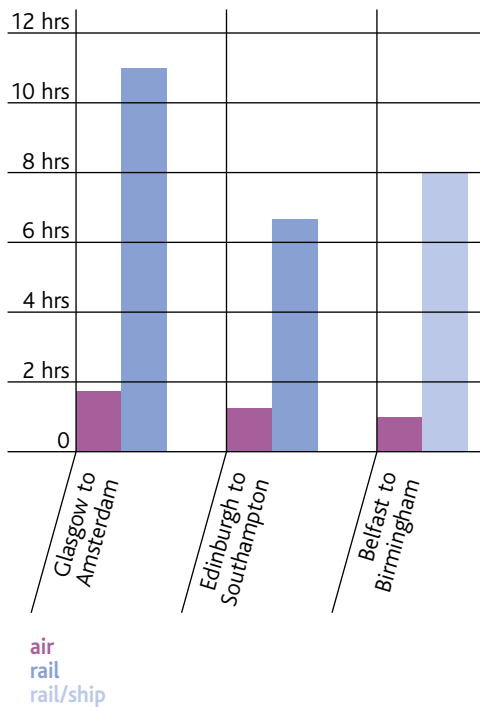
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Issue 5 Rail air substitution

Key fact The Strategic Rail Authority has found that the scope for rail–air substitution for domestic journeys exists but is very small compared to total traffic.²⁵ Domestic air travel accounts for less than 0.5% of UK carbon dioxide emissions.²⁶

UK journey times

source: www.railtrack.co.uk; OAG Executive Flight Guide, Europe, Africa, Middle East, September 2002



A spokesman for anti-aviation group Airport Watch (quoted in the Times 14 November 2002)²⁷ says: 'Government should force people to take the train instead'. It would be unjustified to force people onto trains. Many internal passengers are simply connecting with another plane. Some will still want the choice of an air service because of time and distance, the lack of a direct rail alternative or because of disruption to rail services. In fact for some journeys there is no realistic alternative to flying.

Figures from a Strategic Rail Authority study on rail–air substitution²⁸ show:

- The vast majority of journeys from the English regions to London and the South East are by car (about 55%) and rail (about 42%). Air travel is less than 3% of the market.
- 50% of Manchester–Heathrow air passengers are simply changing planes to another flight.

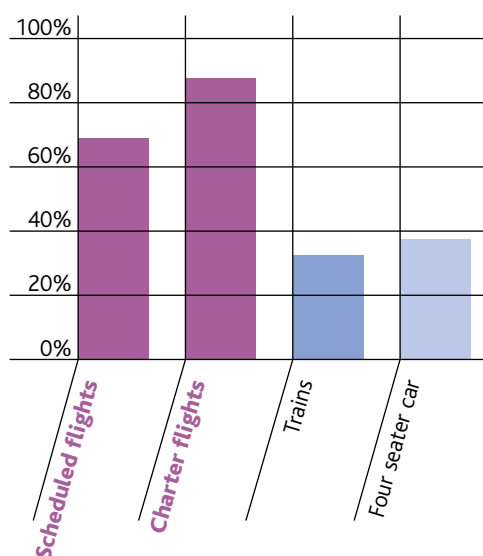
The SRA thought the most optimistic potential for substitution would be 26% and 20% respectively for the North West and Scotland if very high speed rail services (1 hour 15 mins Manchester to London, 2 hours 50 mins Glasgow to London) were introduced and had no capacity constraints. However the **SRA figures show that this would account for less than 1% of the 180 million passengers a year currently flying from UK airports.**

There is a clear consensus that everyone would welcome improving rail services. If there are dramatic improvements in rail services to the North West and Scotland, people may be attracted to switch from air for some domestic journeys. But the figures involved are a tiny proportion of total journeys and would not significantly reduce the need for new airport capacity.

Issue 6 Aviation – environmental regulation

Key fact The number of people disturbed by noise around Heathrow (within the Government’s 57 decibel contour) has dropped from 2 million in 1974 to 300,000 today.

Occupancy of modes of transport in the UK
source: flights: CAA statistics at www.caa.co.uk; trains: CFIT (2001);
cars: Department for Transport National Travel Survey (1996/8)



International standards for limiting the noise of civil aircraft have been increasing in stringency for many years

The reality is that the aviation industry is subject to a wide range of economic, legislative and social incentives to minimise the environmental impact of its operations.

Aviation is covered by the Kyoto Protocol (Article 2.2).²⁹ Air transport emissions within each developed country are included in their individual quotas. The International Civil Aviation Organisation (ICAO) was asked to pursue limitation or reduction of emissions in international airspace (bunker fuels) which could not be easily allocated between countries.

International standards for limiting the noise at source of civil aircraft have been increasing in stringency for many years. Normal commercial operation using aircraft to the last standard, 'Chapter 2', ceased in Europe on 1 April 2002. The next standard, 'Chapter 4', will apply to new designs from 1 January 2006.

Strict EU legislation setting mandatory limits in relation to several pollutants, including NO₂ and PM₁₀ are also set to come into force in 2010.

This is one reason why planes are far quieter and more fuel efficient than they used to be. The number of people disturbed by noise around Heathrow (within the Government’s 57 decibel contour) has dropped from 2 million in 1974 to 300,000 today.³⁰ Modern aircraft are 50% more fuel efficient than 30 years ago, leading to a similar improvement in carbon dioxide emissions.³¹

The industry also makes very efficient use of existing capacity. In the UK in 2001, on average 70% of seats on UK scheduled flights were filled. The figure for UK charter flights is a massive 89%.³² That compares with 33% occupancy on trains³³ and average car occupancy of 1.54 occupants, 38% for a four-seater car³⁴.

Issue 7 Social and economic impact of aviation

Key fact The Department for Transport has estimated the economic benefits of future airport expansion could be worth £18 billion to the UK economy³⁷

As well as direct employment benefits, aviation is a vital contributor to the UK economy as a whole

The UK aviation industry directly employs approximately 180,000 people,³⁸ and supports up to 540,000 additional jobs in associated sectors. **Development of three new runways in the South East could generate as many as 260,000 new jobs by 2030.**

As well as direct employment benefits, aviation is a vital contributor to the UK economy as a whole. Over 20% of the UK's visible exports are now transported by air,³⁹ and for the last 12 years running, London has been ranked as the best city in Europe in which to locate a business.⁴⁰

Aviation also provides significant social benefits to the population at large. In 1977, 7 million UK citizens travelled abroad on holiday. Today that figure is 38 million.⁴¹ **Last year, over 50% of the total UK population took at least one trip by air.**⁴² Inward tourism to the UK also contributed £13 billion to the UK economy annually.⁴³


The social profile of air travel is also changing, as the accessibility of low cost air-fares increases. According to a recent survey by travel operator First Choice Holidays, 71% of UK holidaymakers travelling by air did so from within households with an income of below £40,000 p.a.

Nor is air travel merely a leisure or business activity. **For the UK's minority ethnic communities, aviation provides a vital link to family members and friends overseas. Last year over 10,000,000 passengers flew between the UK and Africa, the Indian Subcontinent and the Caribbean.**

Notes

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- 11 ONS Transport Statistics GB (2002)
- 12 Oxford Economic Forecasting (1999) The Contribution of the Aviation Industry to the UK Economy

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- 16 Written answer by David Jamieson MP, Hansard, 7 Nov 2002, col. 447W
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- 24 DETR (2000b) Air Traffic Forecasts for the United Kingdom
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- 27 Times, 14 November 2002
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- 30 DEFRA Digest of Environmental Statistics (2002). Previous years DfT/ CAA
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- 34 Department for Transport (1996/98) National Travel Survey
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- 36 BBC Radio 4 You and Yours 3 April 2003
- 37 The Future Development of Air Transport – South East Consultation Document, Second Edition, pp.20
- 38 The Contribution of the Aviation Industry to the UK Economy – Oxford Economic Forecasting, 1999
- 39 The Future Development of Air Transport – South East Consultation Document, Second Edition, pp.20
- 40 Healey and Baker European Cities Monitor 2001
- 41 Quoted in FtF Social Impact Assessment, no definitive source
- 42 MORI, 2,025 adults interviewed between 17–21 October 2002
- 43 The Future Development of Air Transport – South East Consultation Document, Second Edition, pp.20



The debate about the impact of aviation on the environment tends to be riddled with myths and half-truths.

This note seeks to set the record straight on one or two of these myths.



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