



## **Unite response to HM Treasury consultation on Aviation Duty**

### **1 Summary**

- 1.1 This response is submitted by Unite the Union, the UK's largest trade union with 2 million members across the private and public sectors. The union's members work in a range of industries including manufacturing, financial services, print, media, construction, transport and local government, education, health and not for profit sectors. The Civil Air Transport (CAT) membership of Unite is currently the largest representative group of workers employed within the aviation industry.
- 1.2 The union's current membership includes 80,000 members working within Civil Aviation and in addition, Unite represents 52,000 members in the aerospace industry. Unite also represents 20,000 members in bulk freight transport who will be directly affected by these proposals and another 11,000 members who work as managers within Royal Mail and other organisations in the postal sector.
- 1.3 Unite is not opposed to a tax on aviation emissions but believes that the change in methodology employed in this case has not taken into account the realities on imposing taxation unilaterally in an international market arena.
- 1.4 Air Passenger Duty maintains a level playing field as it does not discriminate between routes taken by passengers and provides an exemption to transit ticket holders. Aviation Duty has the advantage of capturing air freight traffic but in the process creates an imbalance favouring European hubs and airlines over domestic carriers and facilities. A more balanced approach would be to tax each item of freight a flat rate per kg regardless of the method of shipment or route taken.
- 1.5 Unite believes that the resultant imbalance will also cause a reduction to the connectivity of the UK to the world markets as marginally profitable routes to the developing markets of the Far East, India and other long haul destinations are discontinued.

- 1.6 Cargo only operators will be able to save £12,000 per Boeing 747 long haul flight if they divert to a European hub first before embarking on long haul flights. Internal communications and commerce will also be more expensive as mail operators pass on the charges for internal flights to consumers. Unite believes this will add further costs to Royal Mails ability to meet the universal service obligation, which is already under threat from price controls levied by Postcomm.
- 1.7 Cargo operators already ship a proportion of non urgent mail by road to rival European hubs, this tax will simply add to the volume of freight carried by road and lead to enhanced congestion and emissions.
- 1.8 Unite predicts that the consequential decline in the availability of low cost rapid postal communications and the reduction of international connectivity to the global market will severely effect the UK economy.
- 1.9 Unite believes that if Heathrow does not expand and this tax is introduced as drafted, it will lead to a wholesale relocation of the financial capital of the world away from London.
- 1.10 Unite also believes that the tax on freight carried by air will also see the decline of Nottingham East Midlands International and Stansted airports as cargo only destinations. The imbalance also places at threat the 72,000 jobs employed in the UK freight industry and 500,000 jobs in passenger aviation nationally.
- 1.11 Unite cannot see any solution based on departures which will not cause these eventualities from occurring due to their unilateral nature. The aviation industry is to participate in the European Emissions Trading Scheme (ETS) from 2012. Unite believes that the ETS will provide more than sufficient accountability for this industry's emissions, and would hope that the departure tax would be rescinded post 2012. If this tax is aimed at lowering emissions and not just a new income stream for the Chancellor, these funds must be allocated toward the funding of environmental improvements.
- 1.12 Unite consequently believes that Aviation Duty will cause aircraft to travel further and greater road congestion leading to an increase in overall transport emissions. As drafted, this would decrease the likelihood of this tax achieving its stated aims of providing £3 billion in revenue for the treasury and reducing greenhouse gases.

## **2 Introduction**

- 2.1 Unite believes that the principle behind the idea of taxation on aircraft emissions is sound. Unite does not believe, however, the methodology

that is being suggested to impose a burden on the airline departing the UK especially on long haul flights in this way is the correct method of implementation. As this tax regime is not being rolled out across Europe and other nations it creates an imbalanced market favouring alternative European airlines and hub airports, reducing flights into Heathrow.

- 2.2 It is true to say that the current regime is a blunt weapon. But this solution is more of a shot gun approach rather than the surgical solution that is needed. The current tax regime has the advantage of being simple to administer and police with the minimum number of staff. Given the number of possible permutations, Unite believes that the proposed per plane tax will become a leviathan, requiring a Herculean effort to administer.
- 2.3 Within Europe other nations are introducing or have introduced an aviation tax regime. The Dutch have decided to protect its domestic long haul fleet by providing a clear exemption to transit passengers. The Germans apply a VAT to the fuel costs of internal flights only. Of the other nations with market leading hubs, the French and Spanish have yet to introduce taxation.
- 2.4 The proposed tax on flight departures therefore encourages passengers and freight to fly via the rival hub airports in Europe as opposed to via Heathrow. This will clearly lead to a significant downturn in Heathrow's viability. The 170,000 jobs that depend on Heathrow are already at risk due to the lack of spare capacity at the airport. This threat is not just to Heathrow, however, but to all airports that provide a combination of short haul, long haul and cargo only operations.
- 2.5 The financial savings that could be made are considerable if instead of flying direct UK passengers fly via either Amsterdam or Paris, for example, whilst the volume of emissions increases as passengers fly on longer routes to destinations (see Appendix 1).
- 2.6 Additionally, the proposal will have a serious effect on air freight. At present 56% of air cargo arrives in the UK via Heathrow in the hold of passenger flights. The centres for cargo-only flights are Nottingham East Midlands and Stansted who handle a further 20% of air cargo, principally made up of time critical mail and packages to businesses. If included, this industry could disappear resulting in the loss of thousands of jobs and billions of pounds to UK GDP.
- 2.7 **Unite believes that the proposals are ill conceived and place thousands of UK jobs and the UK economy itself at risk.** A recent report from Deloitte valued the contribution of Heathrow alone at 7% of the

Gross Value Added product of the UK<sup>1</sup>. Its demise will have long-term effects on not just the aviation industry, but on the industries that rely on it.

- 2.8 The European Central Bank is established in Frankfurt which is also home to a hub airport and which in turn recently gained permission to build its fourth runway. Heathrow, by contrast, has been running at over 95% of capacity for almost a decade and has been voted the worlds worst hub airport in numerous surveys. The recent consultation into expansion of Heathrow showed that the finance industry has the greatest demand for connectivity to the global market, due to the widespread distrust of electronic forms of communication in this industry.
- 2.9 Financial companies are already opening offices in Frankfurt and unlike the UK there has not been the same level of aviation opposition that has arisen here. The permission for Frankfurt's fourth runway has come at a time when the growth at the airport was only starting to show signs of stalling.
- 2.10 At Heathrow, growth has not only stalled but the airport is suffering from lengthy delays in getting permission for additional capacity. It took a record seven years of planning and review before permission was granted to build Terminal 5. The need for additional capacity in the South East was identified back in 2000 and confirmed as government policy in the 2003 transport white paper. To date, however, no new runways have been built since World War II. Heathrow has been operating at 98% of it maximum capacity for years, leaving it in a position where its position on the world stage is slipping behind the competition.
- 2.11 This country supports almost 500,000 employees in the aviation industry and has the largest European fleet of civil aircraft. The UK civil fleet is more than twice the size of that based in France and only 56 planes short of those based in the whole of Russia. See appendix 4 below.
- 2.12 The reason for this is primarily due to geography. The UK is an island nation made up of 290 inhabited islands, 95 of which are in Scotland<sup>2</sup>. Some of these island communities rely on air transport to deliver the necessities of life, from post to groceries and access to the mainland. In an area which has no road network to speak of, aircraft have provided the equivalent of a bus route. The UK is also geographically located to the Western fringes of Europe at the end of a route from America that provides the maximum opportunity for a land based landing. Consequently due to demand for flights across the Atlantic, the UK developed into the leading European nation in this industry.

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<sup>1</sup> Source :-The Heathrow Phenomenon, [www.westlondon.com/uploads/heathrowphenomenon.pdf](http://www.westlondon.com/uploads/heathrowphenomenon.pdf).

<sup>2</sup> Source :- Ordnance Survey.

- 2.13 Although our geographical position has not changed, aircraft flight durations and ranges have now improved to the extent that transatlantic flights are now taking place directly from Dubai, by passing Europe altogether. In the past the UK and Europe benefited from the US passengers' need to make landfall in Europe before flying on to other destinations. This is no longer the case. If the burden of green taxation and levies on flights becomes too great, flights will divert around the UK and even Europe to save cost.
- 2.14 The UK aviation industry operates in a global market and does not live in isolation. This industry is highly competitive especially since the introduction of the Open Skies agreement with the United States and hence cannot shoulder the burden of additional cost implications on passengers and cargo flying either from, to or through a UK airport if it is not applied universally elsewhere.

### 3 Maximum Take Off Weight (MTOW)

- 3.1 Unite believes that the use of the square root of the MTOW specified by the manufacturer regardless of load factor would be the simplest method, but not by any means the most just way of assigning taxation. **Unite believes that if the weight is calculated with any variable component to take into consideration load factor it will make a nonsense of environmental policy.** An air journey is most efficient environmentally if all seats are filled, the cargo hold is full and the route benefits from the trade winds<sup>3</sup>. If reductions in the fees are applied to flights with less than a full capacity, it would mean that the proposal will encourage more flights with lower load factors.
- 3.2 The consultation suggests it would be the responsibility of the airport to collect this levy as opposed to the airline. Even if the airline did take over this responsibility it would be impossible for them to know exactly the final load factor of each flight. Consequently, if there is any variable element to the calculation of the tax, the transfer of this charge will be difficult at best to administer.
- 3.3 Additionally, operational requirements cause additional flights to depart London City airport, due to the lack of space on the tarmac at the airport. Flights, land disembark passengers and, if there is no immediate need for embarkation of a new passenger load, the aircraft leaves the terminal and flies to a nearby airport in order to wait for the next time it is required. An expansion of the airport to allow more aircraft on the apron would remove this requirement, but at London City this is not an option, due to restrictions on space. Rescheduling flights would not work either, as the

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<sup>3</sup> A recent BA 747-400 flight from LHR to Sidney via Hong Kong required 146.7 tonnes of fuel on its outward leg but just 122,000 tonnes on the return, due to the beneficial effects of trade winds. These figures include a 13 tonne reserve fuel supply which remained in the tanks on arrival. – source British Airways

aircraft requires a landing slot at the destination airport and volumes do not support a shuttle service.

- 3.4 The problem with using MTOW is that it would charge newer less polluting variants of aircraft models more than their predecessors. A Boeing 747-400 is 19 tonnes heavier than the 747-300 yet the -400 produces 6 tonnes of NO<sub>x</sub> less than the -300 model during the take off cycle alone. Given that the ration of emissions per MTOW tonne decreases with size, in general terms, using the square root of the MTOW as a basis might provide a more balanced appraisal but this is still far from ideal.
- 3.5 Within a single design of aircraft, there are various configurations dependant on the air operator's requirements when it enters service. Engine options, load factors and layout can all affect the MTOW for that design. An aircraft could be configured to maximise the seating potential at the cost of cargo and fuel considerations for medium haul operations. Equally an aircraft can be configured to have a low density seating configuration and maximum fuel capacity for ultra long haul. A clear example of this is with the Airbus A380 which has a MTOW of 560 tonnes and effective range of 8,000 Nautical Miles (n.m.) in its passenger configuration and 590 tonnes and 6,500 as a cargo only aircraft<sup>4</sup>.
- 3.6 Distortions also occur if there is a combination of taxable accumulator per mile and MTOW element as long haul operations can require over 65% of the aircraft's weight to be allocated to the fuel<sup>5</sup>. This results in the aircraft being effectively taxed twice on the fuel on long haul operations. Whilst this benefits the short haul operators, it does so at the expense of long haul operations.
- 3.7 **Unite believes air freight carriers are the companies that will be worst affected by any link between tax and MTOW as they will simply divert operations to Brussels, Frankfurt or another alternative airport which caters to freight operations.** These shipments would probably travel to Brussels by road, thus removing the need for a road / air distribution centre based near an airport.
- 3.8 The only advantage of using a flat MTOW figure will be to encourage airlines to pack more and more passengers on to short haul flights to maximise the load factor ratios, or use alternative routes or methods to ship freight.
- 3.9 It is difficult to see any environmental benefit of the use of MTOW in real terms as a way of linking emissions and the taxable burden. Airlines already remove any superfluous weight to make fuel savings. The only

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<sup>4</sup> Source Airbus - <http://www.airbus.com/en/aircraftfamilies/productcompare/>

<sup>5</sup> An Airbus A380 has a MTOW of 560t and a maximum fuel weight of 361t. The A380F has a MTOW of 590t but can carry a maximum fuel weight of 402t, 68.1% of the aircraft weight.

time aircraft are flown at anything less than capacity is where there is either not the demand to fill the aircraft, which will lead to the route being under treat or axed for being uneconomic, or where the journey is for operational logistical requirements. The use of MTOW will not stop such passenger and cargo flights from taking place if they are critical to airline operation, only punish the British carriers while the European based carriers reap the benefits.

- 3.10 **Unite believes that using MTOW does not help the Government achieve its objectives.** In fact the opposite is true as the use of MTOW will discourage international investment in the UK.

#### **4 NOx / CO<sub>2</sub> emissions in the landing and take-off cycle**

- 4.1 To band an aircraft or engine type to a particular grouping would not be representative of actual emission levels. The simplest method would be to apply a tax on the volume of fuel burnt as there is a clear and present correlation between fuel volumes<sup>6</sup>. Consequently Unite believes that any link between emissions and tax will create a problem with the Chicago agreement as it will be seen as a tax on fuel via the backdoor.
- 4.2 If it were not for this limitation under international law, a direct tax to fuel burn correlation would create a regime which would be more environmentally friendly. A tax that focuses on the volume of fuel burnt rather than any other criteria would also encourage greater environmental investment.
- 4.3 **Unite believes that as there is considerable variation between engine types and even the age of an engine.** For there to be a representative figure allocated, there needs to be a direct measurement taken of each aircraft engine's efficiency. Even when a figure is allocated for a particular engine design the volume of emissions varies dependant on wind speed and the relative direction of travel to that wind. See Appendix 7 for real life examples.
- 4.4 Increased engine pressure ratios and temperatures reduce fuel burn, the release of unburnt hydrocarbons (HC's) and reduce CO<sub>2</sub> but in doing so they increase the production of Nitrous oxides (NO<sub>x</sub>) and Ozone (O<sub>3</sub>). Nacelle modifications reduce noise, but do so at the expense of higher emissions of CO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub>, HC's and increase fuel burn rates. Aircraft engine designers therefore aim to strike a compromise position which is best suited for the application. (see Appendix 5).
- 4.5 Equally, methods of aircraft operation can make considerable differences to emission levels. A steep climb to altitude does reduce the noise impact

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<sup>6</sup> 1 kg of Jet A1 = 3.16 kg of CO<sub>2</sub>

levels on the ground but does so at the expense of GHG emissions and fuel burn rates. Continuous Descent Approach (CDA) reduces both noise and emission levels, but does so at the expense of air traffic management space allocation, causing flights to divert around airports at altitude as opposed to over flying the area.

- 4.6 As with any form of market, applying additional cost to a single nations activities in open market, without a balancing burden being applied across the other participating nations, will unbalance the market in favour of cheaper option. The additional cost of an aviation duty on air departures will make Heathrow less attractive and provide a competitive edge to non UK based airlines.
- 4.7 The CAA gathers records of the emissions of aircraft engines of different types in test bed conditions which might provide the information needed to determine emission efficiency. These tests are conducted in ideal fuel burn conditions, however, and over time due to wear and tear these figures can deviate from the ideal considerably. Robust data collection of emission levels would require the aircraft in question to have its emissions levels recorded at each service at the relevant power settings.
- 4.8 The problem with this approach is that the only time such a test could practically take place would be on the aircraft's service overhauls, due to the need for deflectors and safety equipment to be in place to manage the risks of having an aircraft held stationary whilst at full throttle. The lack of such facilities and suitably trained engineers in the UK and elsewhere and the requirement of airlines to keep their planes flying also mean that it would take several years to process all UK aircraft let alone the numbers that pass through UK airports.
- 4.9 Additionally the production rate of new and replacement aircraft is painfully slow with weighting lists of some 15 years in some cases. As a result the airline operators cannot simply apply a quick fix to reduce the environmental impact of their fleet overnight.

## **5 Other basis**

- 5.1 **Unite believes that if it is truly the aim of government to reduce the number of flights taken, then there should be a tax dependant on the availability of alternative forms of travel.** It is a nonsense that aviation is the only form of public transport that is subject to taxation and the only element which pays for its own infrastructure, without receiving a penny in subsidies.
- 5.2 Aviation duty is set to rise to net a total income value of £3 billion to the Government according to the 2008 Budget. There has been very little evidence that any of the Air Passenger Duty taxation (APD) paid to date

has been spent on environmental improvements. The civil aviation industry itself has always taken strides to increase range and reduce fuel burn in order to provide passengers with flights directly to destinations. In doing so, the industry reduces the financial impact of the fuel price and as a by-product, the volume of CO<sub>2</sub> and other green house gasses (GHG).

## 6 Distance Factor

- 6.1 Unite believes that whilst a system based on distance flown may well be a fairer method of linking environmental impact with the journey taken, it believes that not having it universally applicable to all nation's flights from all departure points in Europe and beyond creates a significant imbalance in the market. Since advent of the Open Skies agreements, US and continental European air corridors have now been opened which enable direct flights between US and EU destinations. As a result there is no longer the need to interchange at Heathrow. This imbalance caused by this unilateral approach will provide incentives to passengers to fly via an alternative European hub rather than via Heathrow or direct to most long haul destinations.
- 6.2 **Unite does not agree with the banding system as suggested.** A flight between Heathrow and Algiers is 900.94 n.m. A flight to Nicosia in Cyprus from Heathrow is by contrast 1,746.78 n.m. Yet the flight to Cyprus is in zone A, while the flight to Algeria is in zone B despite being closer. Flights to Barbados are either under or over the 3,000 mile limit dependant on the airport you depart from and hence create an imbalance favouring the closer airports.
- 6.3 If the banding is decided upon by the distance to the capitals of each of the nations flown to, the location of some of these nations' capitals, geographically, will create discrepancies. Washington DC, for example, is just over the 3000 mile limit yet New York is just under it. Given the importance of the financial markets in New York to the UK financial industry, a heavily taxed flight to New York, discourages investment here, promoting investment in other financial centres, such as Frankfurt.
- 6.4 It is clear from statements in the consultation that the Treasury believe that flying via an international hub is perverse. Due to the distances involved between long haul destinations, aircraft need to be of a certain size in order to carry the fuel to complete the journey. Technically it is possible to configure aircraft in such a way that enables it to complete flights to long haul destinations by sacrificing seating capacity, but to do so increases the risk, makes the cost per flight highly expensive, and results in more flights and emissions overall. The economics of long haul flight require routes to interconnect to make them viable.

- 6.5 **Unite believes that the method employed in this proposal actively encourages hub airport utilisation as long as the hub is not based in the UK.** Appendix 2 below contains examples of the effects of the proposal to tax the aircraft as opposed to the passenger. As can be seen, passengers on long haul journeys could save considerable amounts of tax revenue from flying via a European hub airport rather than direct under the proposal.
- 6.6 Additionally it needs to be remembered that the finances of long haul flights are heavily interlinked with load factor. If multiple flights fly from the various destinations direct, the load factor per aircraft will be low and hence uneconomic. If the passengers gather in a single location for a flight, the numbers of aircraft flights are reduced and the economics become more viable. The airlines have informed us that they budget for around 30% of long haul flight passengers to arrive at the airport by plane from other destinations on transfer tickets. Without these passengers it is highly probable that these routes will no longer take place reducing UK connectivity to the world and the emerging markets of China and India in particular.
- 6.7 The effect of this proposal as it stands encourages the passenger to take a longer journey as their plane will only be taxed on the short haul journey via non UK European hub rather than flying direct. A flight to Los Angeles could add 1,737.38 km to the journey from Glasgow for example, as it could be cheaper to fly there via Paris CDG than flying direct.
- 6.8 Distortions arise with any tax regime which targets just one country's industry in an open global market environment. If the UK airlines face a heavy tax burden while its international rivals do not, the implications for the industry are severe and predictable.
- 6.9 Under APD the passenger pays a set fee dependant on his or her final destination, regardless of the air route taken. Equally transfer passengers are exempt from taxation when flying through airports to join connecting flights. This provided for a level playing field.
- 6.10 Under the proposed regime, tax will be focused on all departures from UK airports, which results in passengers only being subject to tax if they come through a UK airport. A clear example of this imbalance is shown in Fig 1 below based on current APD rates for short and long haul operations.

**Fig 1 – Illustration of tax applicable on a per flight departure basis.**

	Currently Under APD	Flight via Heathrow	Flight via Amsterdam	Train via Heathrow
Manchester to Hub airport	£-	£10	£10	£-
Hub airport to Hong Kong	£40	£40	£-	£40
Hong Kong to Hub airport	£-	£-	£-	£-
Hub airport to Manchester	£-	£10	£-	£-
<b>Total</b>	£40	£60	£10	£40

6.11 Clearly such a move makes a journey using a flight to Amsterdam more attractive saving a family of four, £200 on their economy tickets, whilst causing more emissions to be released. In such a competitive market for passengers, such a saving would have the clear potential to drive passengers away from Heathrow and even off of the train in favour of a short hop to either Amsterdam or Charles De Gaul airport in Paris.

6.12 Unite believes that a link between distance and emissions per passenger/tonne of cargo km would be an environmentally correct way of applying taxation. But for it to work, the tax regime would need to be rolled out globally at the same rate of tax by each nation. To roll out a tax regime such as that suggested will create widespread loss of jobs and reduce the likelihood of the Treasury in achieving its £3 billion goal.

## **7 General Aviation**

7.1 If the provision of a tax on aviation is aimed at reducing its environmental impact, the provision of de minimis limits before any tax will arise, promotes the use of individual private owner operators at the expense of bulk transport. A de minimis limit based on the weight of an aircraft may provide a quick and easy solution to the issue of light aircraft classification but promotes the use of personalised business flights which are highly polluting in terms of grams of CO<sub>2</sub> per passenger km.

7.2 The suggested 5.7 tonnes limit would not differentiate in general terms between private business operators and pleasure flights as there are numerous aircraft which are used daily on business passenger operations which are below this limit. An example of this is the 6 passenger Cessna Caravan 675 which has a MTOW of just 3.629 metric tonnes and its cargo variant the Cessna Caravan Super Cargo Master, which is used by Fed Ex and others, which has a MTOW of just 3,969 metric tonnes.

## **8 Exemptions**

- 8.1 Unite believes that there is a strong case for helicopter flights to and from oil and gas platforms to be added to the exemptions stated in the consultation, given the national need for additional energy supply resources. At present such flights are subject to taxation despite providing the only viable lifeline to these installations.
- 8.2 This country is facing an energy crisis. Due to the enforced closure of large combustion plants following a European Directive, the closure of nuclear installations which have reached the end of their natural life span and increased demand, greater reliance on base load supply of electricity has been placed on gas fired generation. The Governments' insistence on leaving the make up of replacement generation decisions to the market has produced another dash for gas. During the winter of 2005/6 the impact of decreased supply from the North Sea coupled with inadequate storage and import facilities, resulted in the price of this commodity increasing by 500%.
- 8.3 Since early 2006 this country has seen investment in new import facilities such as two new interconnectors and improved liquefied natural gas (LNG) import and pipeline facilities, aimed at providing up to 20% of the UK gas supply needs. Sonotrach (the Algerian gas producer) recently ordered the diversion of the Ramdane Abane to Turkey instead of the Isle of Grain to which it was originally headed with its £15 million cargo of LNG, as the price offered there was higher than in the UK. This has not been the only incident where such last minute diversions have occurred and market analysis has suggested that a mid Atlantic market for LNG will only become stronger as gas supplies are diverted to the developing world economies and supply dries up from some sources.
- 8.4 Greater exploration of the UK continental plate is needed in order to maximise on the UK's natural reserves of gas and oil as well as providing facilities for the long term storage of emissions under Carbon Capture and Storage proposals. Taxation on such flights is therefore self defeating, in that it removes revenue from the very companies engaged in this exploration, which could bring billions of pounds into the UK and provide a far more secure source of these commodities.

## **9 Freight**

- 9.1 The UK freight and express freight industry supports at least 72,000 jobs nationally, contributing £1.3 billion to the UK economy. A very large proportion of these staff is specifically employed in the air cargo transit side of the business. If flights relocate their operations, these jobs would be redundant and new posts will be created elsewhere in Europe.

9.2 **Unite believes that if a tax burden is placed on freight only flights, other airports and methods of transport may be utilised causing greater harm to the environment.** The sums indicated in Fig 2 below, may include an element of double counting, where freight is shipped internally by air.

**Fig 2 - Freight volumes and an illustration of the volumes carried on existing passenger aircraft.**

Airport	Freight volume	Volume on Passenger Flights	Percentage on Passenger Flights
Heathrow	1,310,986.55	1,236,974.15	94.35%
Nottingham East Midlands Int'l	274,752.85	153.15	0.06%
Stansted	203,746.56	1,485.74	0.73%
Gatwick	171,077.83	168,614.26	98.56%
Manchester	165,365.94	86,225.04	52.14%
All Other	207,968.45	28,938.09	14.97%

Source :- CAA.

9.3 Within Europe, Paris Charles De Gaul handles almost as much air cargo as the entire volume shipped within the UK (as seen in Fig 3 below). Brussels National Airport by contrast is both nearer. By road the journey to Brussels National Airport from Nottingham East Midlands airport is 569.9 km, which, according to the RAC, will take about 7¼ hours. The same journey takes just 47 minutes to complete the 452.6 km flight.

**Fig 3 – European Air Freight Airports by metric tonnes of cargo handled in 2007**

Current World Ranking	City (Airport)	Total Cargo		% Growth last from year
		2000	2007	
-	Total UK air freight		2,333,898	0.4
6	Paris, FR (CDG)	1 610 484	2,297,896	7.8
8	Frankfurt, DE (FRA)	1 709 942	2,169,025	1.9
14	Amsterdam (AMS)	1 267 385	1 651 385	5.4
18	London, GB (LHR)	1 402 089	1,395,909	3.9
23	Luxembourg, LU (LUX)	404,872	856,740	14
26	Brussels, BE (BRU)	687 385	728,689	2.1
29	Cologne, De (CGN)	375,325	710,244	2.8

Source:- Airports Council International

9.4 **Unite believes that time critical flights may still call at UK distribution centres but will alter their routes to minimise the tax implications.** An example of this is Federal Express who call at Stansted to collect the pre 9

- am next day parcels and packages before departing for the company distribution centre in the US. If introduced as suggested the company could easily reschedule this service so that the aircraft doubles back on itself to collect its cargo from another EU nation before committing to its final leg back to the US. Such a rescheduling will increase the flight duration and hence emissions but keep the tax implications to a minimum.
- 9.5 Non time-critical flights to world wide destinations on the other hand will no doubt be heavily affected by the cost implications of the additional tax burden. Where an airline can reschedule routes to avoid long haul freight flights from the UK it can make substantial savings in terms of the tax burden. In an industry where the profit margin is measured in pence per kilo such a levy may not be sustainable.
- 9.6 **Unite believes that the application of a standard charge on each aircraft departure regardless of configuration would be unsustainable.** According to Airbus an A380 has a typical seating capacity in a three class configuration of 525 passengers<sup>7</sup>. Under APD the revenue raised by these passengers on a long haul flight therefore equates to £21000<sup>8</sup> or £5,250 per short haul flight using this aircraft. The A380F freighter aircraft will carry a typical volumetric payload of 157.4 tonnes if it reduces its fuel load and hence maximum range. The resulting charge would result in a £133.42 per tonne tax burden on a long haul flight or a £33.35 per tonne on short haul.
- 9.7 In 2007 the UK imported £308,506 million worth of goods but exported just £220,857 million. The resulting imbalance means that the tax burden share per tonne will be higher than the ideal as aircraft leave with less than the optimum capacity utilised. The imbalance between air cargo imports and exports will also encourage a switch to road haulage on non time-critical items.
- 9.8 The Department of Transport's study on the relative costs of air and road transport "UK air freight study report" in 1998 concluded that *"It is not unusual for airlines and air freight forwarders to truck cargo to and from mainland Europe either for the transfer of cargo to continental hub airports for Inter-Continental movements, or even for Intra-European movements"*. This is still the case and has become the norm in some cases. The practice of road shipment will no doubt increase if additional costs are added to the price of air transport.
- 9.9 The application of taxation on freight-only aircraft creates an environment conducive to the relocation of freight only operations to continental Europe. A combined total of 20.5% of all air freight was shipped through

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<sup>7</sup> Source Airbus. - <http://www.airbus.com/en/aircraftfamilies/productcompare>

<sup>8</sup> If all passengers flew economy. If part of the layout provided for a three class seating arrangement, this amount would be higher dependant on the number of business class and first class accommodation.

Nottingham East Midlands Airport and London Stansted on cargo-only flights last year, providing around 10,000 jobs at each location. If this tax is implemented as indicated all of these jobs will be at risk. If filled to capacity, the cargo from these two airports alone would place an additional 19,075 lorry journeys on our roads each year. Sadly the average HGV carries just 45% of this capacity more than doubling this number.<sup>9</sup>

- 9.10 A 40 tonne, 5 axle lorry causes over 10,000 times more damage to road surfaces than an average car<sup>10</sup>. Carbon dioxide emissions from road hauliers increased by more than a third between 1990 and 2002 and are continuing to rise. Road freight accounts for over 8 per cent of UK CO<sub>2</sub> emissions<sup>11</sup>. HGV/LGVs are responsible for more fatalities than any other work vehicle type regardless of blame. In particular on rural A roads and motorways, due to poor observation, close following, fatigue, load problems, vehicle defects & time constraints. A quarter of fatalities are caused by LGV/HGV drivers breaking the speed limit<sup>12</sup>. By comparison air freight is safer and a less polluting option in real terms.
- 9.11 Despite the introduction of strict limitations on the number of hours drivers spend behind the wheel, the number of accidents involving HGV drivers still remains alarmingly high (see Fig 4). It would appear that the most dangerous time to be on the road is between 2am and 6am when 30.6 % of HGV accidents occurred. This is just the period when express deliveries of freight take place and hence the predicted increase in HGV movements will only serve to increase the risk.

**Fig 4: HGV accident injuries 2000-06**

	<b>Fatal</b>	<b>Serious</b>	<b>Slight</b>
<b>2000</b>	42	439	2557
<b>2001</b>	47	387	2416
<b>2002</b>	51	387	2219
<b>2003</b>	42	325	2227
<b>2004</b>	41	316	2094
<b>2005</b>	48	299	2094
<b>2006</b>	36	294	1802
<b>% Change</b>	-14.3	-33.0	-29.5

Source Department for Transport

- 9.12 DHL operate an air service through 12 European hub destinations employing 800 staff at Nottingham East Midlands airport. This facility can transfer 1,200 tonnes of mail and parcels every night from this £35 million facility. This location was chosen as it was central to the UK's road

<sup>9</sup> CSRG 2004 - Transport of Goods by Road in Great Britain: 2005

<sup>10</sup> Design Manual for Roads and Bridges, Highways Agency, 1994

<sup>11</sup> Department for Environment, food and Rural Affairs 2005

<sup>12</sup> Road Safety Research Report no 58 see bullet above for DfT August 2005

network with an easy air transfer capability. This facility is designed to handle 35 trucks and 18 aircraft at a time with parking for an additional 70 trucks on site. If this tax is instigated as suggested, flights out of this facility may come to an end, in favour bulk road transfers through the Channel Tunnel and by sea.

9.13 The postal sector is another significant user of aviation. The Royal Mail dispatches thousands of tonnes on parcels and letters each day. The transfer of these letters and parcels are legally time critical and can only be accomplished if flown between destinations. The resultant increase in cost that will be applied to the postal sector will have to be passed on to the consumer and increasing their commercial disadvantages brought in by Postcomm price and ex anti regulatory controls. The Royal Mail is already suffering huge losses which have occurred since liberalisation of the sector. Any further pressure will threaten the economic and social viability of them providing even the minimum universal service obligation requirements.

9.14 Although the introduction of Aviation Duty would only affect the aircraft departing the UK, if long haul routes are slashed, the facility to import food and other produce from developing countries will be effected. 60% of fresh produce from these nations was imported to the UK in holds of passenger aircraft last year. Without the income from exports many third world economies would collapse and will cause prices to rise.

## 10 Transit/Transfer Services

10.1 Current transfer flight ticket holders are exempt from any taxation under APD. The introduction of per flight departure taxation will suddenly cause passengers on such routes to pay tax on the departing flight. This will create an imbalance which favours the continental hub airports and their airlines. Fig 1 illustrated earlier that a family of four could make significant savings by flying from a domestic airport to a European hub other than Heathrow. On transfer passengers the current proposed regime the effect of taxation is even more pronounced. (see Fig 5 below.)

**Fig 5 – Illustration of tax applicable on transfer passenger and direct flights**

	Under APD	Flight via Heathrow	Flight via Frankfurt	Flight direct under open skies
Rome to Hub Airport	£0	£0	£0	
Hub Airport to New York	£0	£40	£0	£0
New York to Hub Airport	£0	£0	£0	
Hub Airport to Rome	£0	£10	£0	£0
<b>Total</b>	<b>£0</b>	<b>£50</b>	<b>£0</b>	<b>£0</b>

- 10.2 When connecting two international long haul flights the tax proposed would result in an £80 charge for the use of Heathrow per passenger while other hubs are exempt from any taxation by their national governments. This resultant imbalance in the market cost of a return ticket will clearly encourage passengers away from travelling via Heathrow.
- 10.3 The principal implication of this proposal will be more economic than environmental to the detriment of the UK economy. Don Langford of American Airlines has already informed the House of Commons Transport select Committee that *“With our customer flows to points beyond Europe, ... Heathrow is becoming a less popular transit hub and we are finding that customers are making their transfers at other airports within Europe, and we believe this to be a trend which is continuing”*<sup>13</sup>.
- 10.4 Further pressure and indeed a financial incentive to utilise the services of other European Hub airports places the viability of long haul operations from Heathrow at risk.
- 10.5 Aviation jet fuel price currently stands at around US\$1080.4 per metric tonne<sup>14</sup> which equates to a 65.6% rise in the last year alone. A Boeing 777 requires 93,375 litres of fuel to fly to Madras from London Heathrow with an emergency reserve of 12,500 litres<sup>15</sup>. Per passenger this equates to around £104 if the aircraft were configured to carry the maximum 451 passengers. The combination of charges, levies and staffing costs, makes the return fee to Madras cost the airline around £400 a head. Air-France is currently offering economy return tickets on this route for just £388 which includes taxes and charges.
- 10.6 Ticket prices can be offered at such a low rate due to the rapid increase in price per seat which occurs on last minute bookings and the rates available on business and first class accommodation. The rate is also set lower on flights which require intermediate landings on route as the airline can sell the seat to passengers who only wish to fly to the intermediate airport. Flights to Singapore, for example, often fly on to Sydney or Melbourne, Australia, capitalising on the demand for flights between these two locations. The flight ticket price is also subsidised by the volumes of air freight in the hold of these flights.
- 10.7 Domestic passenger airlines have taken action recently by tentatively raising their base fares to cope with rising fuel prices. After a period of deep losses extending from 2001 through 2005, 2006 signalled a return to profitability of some airlines. Notwithstanding this return, domestic passenger yields have lagged significantly behind the skyrocketing jet fuel

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<sup>13</sup> The House of Commons Transport Select Committee report into the future of BAA – published March 2008  
<http://www.publications.parliament.uk/pa/cm200708/cmselect/cmtran/119/119.pdf>

<sup>14</sup> [http://www.iata.org/whatwedo/economics/fuel\\_monitor/index.htm](http://www.iata.org/whatwedo/economics/fuel_monitor/index.htm) - figures taken on 08/04/2008

<sup>15</sup> Source:- British Airways

prices. This is a global problem, not one confined to the UK. For the 2003-2007 period, ATA domestic passenger yields grew at a compounded rate of 2%, while the domestic jet fuel prices grew by 25.3 percent during the period.

- 10.8 Clearly, as things stand, unless the load factor is very high, such routes will only be marginally profitable. The cost to the consumer cannot be easily passed on due to the intense competition from other nations' airlines. Adding an additional tax burden which increases over distance will serve to make such routes unsustainable, especially if the same burden is not applied to the competition which flies via European hubs.

## **11 Conclusion**

- 11.1 Unite firmly believes that in such a price critical global market, the applicability of this proposal will cause a considerable decline in the aviation industry in this country. The proposals will also cause numerous companies in other industries to consider relocation due to the high cost of travel and the resulting loss of logistical and personal connectivity.
- 11.2 The aviation industry will be joining the European Emission Trading Scheme in 2012 and hence is already taking every step which is economically reasonable to reduce fuel burn and emissions. This has not been driven by taxation but by the rapid climb in the cost of Jet A1 aviation fuel. In recent days we have seen the economic collapse of airlines that have been caused by the combination of this price and the competitive nature of the passenger market.
- 11.3 There is no reason why air freight needs to land in the UK. If it does not do so, however, it will reduce the viability of long haul passenger flights and create additional emissions and congestion on the nation's roads.
- 11.4 Heathrow as a hub airport is already struggling against competition from alternative European hubs and has not been able to adapt to demand due to capacity limitations. In 2003 the UK Government concluded that additional runway airport capacity is needed in the South East. No such growth has occurred to date. In Frankfurt permission for a fourth runway has been approved. In Madrid new capacity is attracting global businesses to the area as flight frequency is increased.
- 11.5 The UK aviation industry is already showing signs of decline, and with it will go the economic stability and competitiveness of the country as a whole. The UK cannot afford to pursue an isolationist policy in a global marketplace especially in light of the EU US Open Skies policy. Environmentally the UK is leading the way, but this should not be at the expense of the nations ability to provide social and economic cohesion.

11.6 Unite does not believe there is an easy way to make the per plane departure based tax work if it is not mirrored across the globe. Due to the way in which it is structured to focus on the aircraft departure, regardless of the final destination of passenger or cargo, a natural imbalance is created.

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**Appendix 1 – Passenger connectivity via Heathrow and rival EU hub airports**

	<b>London Heathrow</b>	<b>Amsterdam</b>	<b>Paris CDG</b>	<b>Brussels</b>	<b>Frankfurt Main</b>	<b>Copenhagen</b>	<b>Milan</b>
Aberdeen	10.5	5.0	2.9			1.0	
Belfast City	7.6						
Belfast International		1.0	1.0				
Birmingham		7.5	9.9	3.7	7.3	1.7	1.7
Bournemouth		1.0					
Bristol		5.0	4.4	2.2	1.0		1.0
Cardiff Wales		4.4					
Coventry		0.8					
Doncaster Sheffield	0.8						
Durham Tees Valley	2.8	3.0	0.7				
East Midlands		1.9	1.4	2.1			
Edinburgh	17.8	5.8	5.1	2.3	3.0	1.7	
Exeter		1.7					
Glasgow	16.3	4.4				1.0	
Humberside	3.1						
Inverness	1.0						
Leeds Bradford	3.5	5.0	3.4	2.0			
Liverpool		3.5	2.0				
Manchester	15.4	8.6	9.5	4.9	6.8	2.5	3.5
Newcastle	5.8	6.0	3.8	1.7			
Norwich		3.8					
Southampton		2.9	2.5	1.9			
<b>Total</b>	<b>80.5</b>	<b>73.3</b>	<b>48.3</b>	<b>20.8</b>	<b>18.1</b>	<b>7.9</b>	<b>6.2</b>
<b>UK regional airports served</b>	<b>9</b>	<b>19</b>	<b>13</b>	<b>8</b>	<b>4</b>	<b>5</b>	<b>3</b>

## Appendix 2 - Comparative of flights taken Direct from the UK and via Amsterdam or Paris and the savings that could be made in tax and additional kilometres flown to achieve these savings

Based on a tax rate of 1.5p per km on Medium/Long haul

<b>Algiers Algeria</b>									
	Direct (km)	tax	via Paris (km)	tax	additional km's	via Amsterdam (km)	tax	additional km's	
Heathrow	<b>1668.54</b>	<b>£25.03</b>	<b>1717.78</b>	<b>£10.00</b>	<b>49.24</b>	2109.62	<b>£10.00</b>	<b>441.08</b>	
Edinburgh	<b>2196.58</b>	<b>£32.95</b>	<b>2238.36</b>	<b>£10.00</b>	<b>41.78</b>	2405.59	<b>£10.00</b>	<b>209.01</b>	
Glasgow	<b>2207.65</b>	<b>£33.11</b>	<b>2266.29</b>	<b>£10.00</b>	<b>58.64</b>	2457.15	<b>£10.00</b>	<b>249.50</b>	
Manchester	<b>1899.71</b>	<b>£28.50</b>	<b>1957.85</b>	<b>£10.00</b>	<b>58.14</b>	2226.05	<b>£10.00</b>	<b>326.34</b>	
Birmingham	<b>1794.00</b>	<b>£26.91</b>	<b>1857.48</b>	<b>£10.00</b>	<b>63.48</b>	2181.5	<b>£10.00</b>	<b>387.50</b>	
Newcastle	<b>2072.48</b>	<b>£31.09</b>	<b>2099.53</b>	<b>£10.00</b>	<b>27.05</b>	2261.39	<b>£10.00</b>	<b>188.91</b>	
Norwich	<b>1782.64</b>	<b>£26.74</b>	<b>1786.89</b>	<b>£10.00</b>	<b>4.25</b>	1978.69	<b>£10.00</b>	<b>196.05</b>	

<b>Bangalore India</b>									
	Direct (km)	tax	via Paris (km)	tax	additional km's	via Amsterdam (km)	tax	additional km's	
Heathrow	<b>8049.75</b>	<b>£ 120.75</b>	<b>8183.52</b>	<b>£ 10.00</b>	<b>133.77</b>	<b>8069.03</b>	<b>£ 10.00</b>	<b>19.28</b>	
Edinburgh	<b>8236.38</b>	<b>£ 123.55</b>	<b>8714.17</b>	<b>£ 10.00</b>	<b>477.79</b>	<b>8350.26</b>	<b>£ 10.00</b>	<b>113.88</b>	
Glasgow	<b>8172.05</b>	<b>£ 122.58</b>	<b>8735.86</b>	<b>£ 10.00</b>	<b>563.81</b>	<b>8399.31</b>	<b>£ 10.00</b>	<b>227.26</b>	
Manchester	<b>8172.05</b>	<b>£ 122.58</b>	<b>8447.24</b>	<b>£ 10.00</b>	<b>275.19</b>	<b>8182.77</b>	<b>£ 10.00</b>	<b>10.72</b>	
Birmingham	<b>8151.44</b>	<b>£ 122.27</b>	<b>8342.38</b>	<b>£ 10.00</b>	<b>190.94</b>	<b>8151.57</b>	<b>£ 10.00</b>	<b>0.13</b>	
Newcastle	<b>8135.49</b>	<b>£ 122.03</b>	<b>8574.79</b>	<b>£ 10.00</b>	<b>439.30</b>	<b>8208.68</b>	<b>£ 10.00</b>	<b>73.19</b>	
Norwich	<b>7934.70</b>	<b>£ 119.02</b>	<b>8267.75</b>	<b>£ 10.00</b>	<b>333.05</b>	<b>7935.06</b>	<b>£ 10.00</b>	<b>0.36</b>	

<b>Cape Town SA</b>									
	Direct (km)	tax	via Paris (km)	tax	additional km's	via Amsterdam (km)	tax	additional km's	
Heathrow	<b>9664.55</b>	<b>£ 144.97</b>	<b>9675.91</b>	<b>£ 10.00</b>	<b>11.36</b>	<b>10055.44</b>	<b>£ 10.00</b>	<b>390.89</b>	
Edinburgh	<b>10193.56</b>	<b>£ 152.90</b>	<b>10206.56</b>	<b>£ 10.00</b>	<b>13.00</b>	<b>10336.67</b>	<b>£ 10.00</b>	<b>143.11</b>	
Glasgow	<b>10201.72</b>	<b>£ 153.03</b>	<b>10228.25</b>	<b>£ 10.00</b>	<b>26.53</b>	<b>10385.72</b>	<b>£ 10.00</b>	<b>184.00</b>	
Manchester	<b>9914.93</b>	<b>£ 148.72</b>	<b>9939.63</b>	<b>£ 10.00</b>	<b>24.70</b>	<b>10169.18</b>	<b>£ 10.00</b>	<b>254.25</b>	
Birmingham	<b>9799.23</b>	<b>£ 146.99</b>	<b>9834.77</b>	<b>£ 10.00</b>	<b>35.54</b>	<b>10137.98</b>	<b>£ 10.00</b>	<b>338.75</b>	
Newcastle	<b>10062.07</b>	<b>£ 150.93</b>	<b>10067.18</b>	<b>£ 10.00</b>	<b>5.11</b>	<b>10195.09</b>	<b>£ 10.00</b>	<b>133.02</b>	
Norwich	<b>9759.15</b>	<b>£ 146.39</b>	<b>9760.14</b>	<b>£ 10.00</b>	<b>0.99</b>	<b>9921.47</b>	<b>£ 10.00</b>	<b>162.32</b>	

<b>Rio De Janeiro Brazil</b>									
	Direct (km)	tax	via Paris (km)	tax	additional km's	via Amsterdam (km)	tax	additional km's	
Heathrow	<b>9255.08</b>	<b>£ 138.83</b>	<b>9503.52</b>	<b>£ 10.00</b>	<b>248.44</b>	<b>9951.99</b>	<b>£ 10.00</b>	<b>696.91</b>	
Edinburgh	<b>9538.24</b>	<b>£ 143.07</b>	<b>10034.17</b>	<b>£ 10.00</b>	<b>495.93</b>	<b>10233.22</b>	<b>£ 10.00</b>	<b>694.98</b>	
Glasgow	<b>9489.30</b>	<b>£ 142.34</b>	<b>10055.86</b>	<b>£ 10.00</b>	<b>566.56</b>	<b>10282.27</b>	<b>£ 10.00</b>	<b>792.97</b>	
Manchester	<b>9358.55</b>	<b>£ 140.38</b>	<b>9767.24</b>	<b>£ 10.00</b>	<b>408.69</b>	<b>10065.73</b>	<b>£ 10.00</b>	<b>707.18</b>	
Birmingham	<b>9279.80</b>	<b>£ 139.20</b>	<b>9662.38</b>	<b>£ 10.00</b>	<b>382.58</b>	<b>10034.53</b>	<b>£ 10.00</b>	<b>754.73</b>	
Newcastle	<b>9513.17</b>	<b>£ 142.70</b>	<b>9894.79</b>	<b>£ 10.00</b>	<b>381.62</b>	<b>10091.64</b>	<b>£ 10.00</b>	<b>578.47</b>	
Norwich	<b>9431.20</b>	<b>£ 141.47</b>	<b>9587.75</b>	<b>£ 10.00</b>	<b>156.55</b>	<b>9818.02</b>	<b>£ 10.00</b>	<b>386.82</b>	

### Los Angeles US

	Direct (km)	tax	via Paris (km)	tax	additional km's	via Amsterdam (km)	tax	additional km's
Heathrow	8735.60	£ 131.03	9417.68	£ 10.00	682.08	9315.85	£ 10.00	580.25
Edinburgh	8275.81	£ 124.14	9948.33	£ 10.00	1,672.52	9597.08	£ 10.00	1321.27
Glasgow	8232.64	£ 123.49	9970.02	£ 10.00	1,737.38	9646.13	£ 10.00	1413.49
Manchester	8497.46	£ 127.46	9681.4	£ 10.00	1,183.94	9429.59	£ 10.00	932.13
Birmingham	8586.93	£ 128.80	9576.54	£ 10.00	989.61	9398.39	£ 10.00	811.46
Newcastle	8420.61	£ 126.31	9808.95	£ 10.00	1,388.34	9455.5	£ 10.00	1034.89
Norwich	8737.30	£ 131.06	9501.91	£ 10.00	764.61	9181.88	£ 10.00	444.58

### Reykjavik Iceland

	Direct (km)	tax	via Paris (km)	tax	additional km's	via Amsterdam (km)	tax	additional km's
Heathrow	1880.36	£ 28.21	2570.93	£ 10.00	690.57	2399.93	£ 10.00	519.57
Edinburgh	1373.43	£ 20.60	3101.58	£ 10.00	1,728.15	2681.16	£ 10.00	1307.73
Glasgow	1341.18	£ 20.12	3123.27	£ 10.00	1,782.09	2730.21	£ 10.00	1389.03
Manchester	1626.44	£ 24.40	2834.65	£ 10.00	1,208.21	2513.67	£ 10.00	887.23
Birmingham	1732.28	£ 25.98	2729.79	£ 10.00	997.51	2482.47	£ 10.00	750.19
Newcastle	1519.34	£ 22.79	2962.2	£ 10.00	1,442.86	2539.58	£ 10.00	1020.24
Norwich	1843.29	£ 27.65	2655.16	£ 10.00	811.87	2265.96	£ 10.00	422.67

### Oslo Norway

	Direct (km)	tax	via Paris (km)	tax	additional km's	via Amsterdam (km)	tax	additional km's
Heathrow	1168.71	£ 17.53	1681.21	£ 10.00	512.50	1294.88	£ 10.00	126.17
Edinburgh	930.99	£ 13.96	2211.86	£ 10.00	1,280.87	1576.11	£ 10.00	645.12
Glasgow	992.64	£ 14.89	2233.55	£ 10.00	1,240.91	1625.16	£ 10.00	632.52
Manchester	1061.47	£ 15.92	1944.93	£ 10.00	883.46	1408.62	£ 10.00	347.15
Birmingham	1135.86	£ 17.04	1840.07	£ 10.00	704.21	1377.42	£ 10.00	241.56
Newcastle	917.80	£ 13.77	2072.48	£ 10.00	1,154.68	1434.53	£ 10.00	516.73
Norwich	995.36	£ 14.93	1765.44	£ 10.00	770.08	1160.91	£ 10.00	165.55

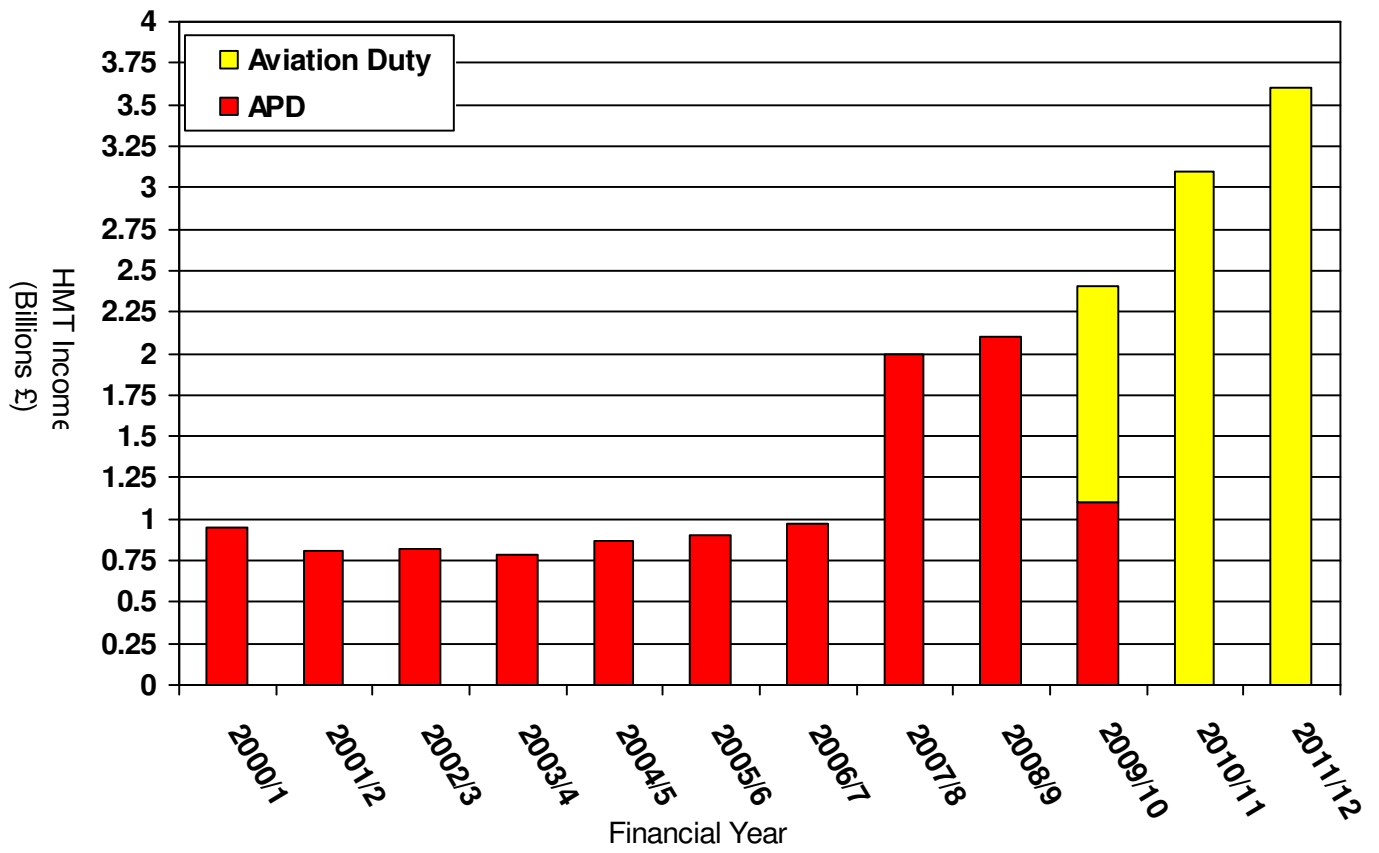
### Tokyo Japan

	Direct (km)	tax	via Paris (km)	tax	additional km's	via Amsterdam (km)	tax	additional km's
Heathrow	9569.94	£ 143.55	10048.27	£ 10.00	478.33	9666.15	£ 10.00	96.21
Edinburgh	9232.30	£ 138.48	10578.92	£ 10.00	1,346.62	9947.38	£ 10.00	715.08
Glasgow	9275.47	£ 139.13	10600.61	£ 10.00	1,325.14	9996.43	£ 10.00	720.96
Manchester	9437.02	£ 141.56	10311.99	£ 10.00	874.97	9779.89	£ 10.00	342.87
Birmingham	9526.10	£ 142.89	10207.13	£ 10.00	681.03	9748.69	£ 10.00	222.59
Newcastle	9274.81	£ 139.12	10439.54	£ 10.00	1,164.73	9805.80	£ 10.00	530.99
Norwich	9396.60	£ 140.95	10132.50	£ 10.00	735.90	9532.18	£ 10.00	135.58

### Auckland NZ

	Direct (km)	tax	via Paris (km)	tax	additional km's	via Amsterdam (km)	tax	additional km's
Heathrow	18335.06	£ 275.03	18874.06	£ 10.00	539.00	18486.99	£ 10.00	151.93
Edinburgh	17874.69	£ 268.12	19404.71	£ 10.00	1,530.02	18768.22	£ 10.00	893.53
Glasgow	17891.84	£ 268.38	19426.40	£ 10.00	1,534.56	18817.27	£ 10.00	925.43
Manchester	18137.79	£ 272.07	19137.78	£ 10.00	999.99	18600.73	£ 10.00	462.94
Birmingham	18248.00	£ 273.72	19032.92	£ 10.00	784.92	18569.53	£ 10.00	321.53
Newcastle	17968.46	£ 269.53	19265.33	£ 10.00	1,296.87	18626.64	£ 10.00	658.18
Norwich	18176.28	£ 272.64	18958.29	£ 10.00	782.01	18353.02	£ 10.00	176.74

**Appendix 3 – Predictions of the amounts raised via APD and Aviation duty**



Source:- BATA

## Appendix 4 - Number of Companies and Aircraft per Nation

EU Member State	Country	Aircraft	Companies	Aircraft/Company
*	Russia	982	69	14.23
*	UK	925	43	21.51
*	Germany	787	25	31.48
*	France	465	16	29.06
*	Spain	428	23	18.61
*	Italy	352	22	16.00
*	Netherlands	231	9	25.67
*	Sweden	221	15	14.73
*	Ireland	217	6	36.17
	Turkey	205	16	12.81
	Switzerland	127	11	11.55
*	Belgium	126	7	18.00
	Norway	120	6	20.00
*	Portugal	88	9	9.78
*	Denmark	87	6	14.50
*	Bulgaria	77	9	8.56
*	Finland	75	5	15.00
*	Poland	73	6	12.17
*	Greece	71	8	8.88
*	Czech Republic	63	4	15.75
*	Austria	54	9	6.00
*	Hungary	46	4	11.50
*	Romania	41	4	10.25
*	Luxemburg	34	3	11.33
	Moldova	24	6	4.00
*	Cyprus	21	3	7.00
*	Lithuania	18	5	3.60
	Serbia	16	2	8.00
*	Slovenia	15	1	15.00
*	Estonia	14	3	4.67
*	Latvia	13	3	4.33
	Greenland	11	1	11.00
*	Slovakia	11	1	11.00
*	Malta	9	2	4.50

Source: - Flight ACAS database (April 2007)

**Appendix 5 – Comparison of emission levels on old and new designed  
airline engines**

MODE	POWER SETTING (%Foo)	TIME minutes	FUEL kg/s	FLOW EMISSIONS INDICES (g/kg)			
				HC	CO	NOx	SMOKE NUMBER
TAKE-OFF	100	0.7	0.50	*	6.2	11.5	46.3
CLIMB OUT	85	2.2	0.42	0.74	7.9	9.3	38.4
APPROACH	30	4.0	0.15	7.4	51	3.6	10.9
IDLE	7	26.0	0.05	59.5	178.4	1.5	2.7

Rolls Royce  
1RR001 -  
M45H-01  
from 1971

TAKE-OFF	100	0.7	4.03	0.02	0.27	47.79	0
CLIMB OUT	85	2.2	3.19	0	0.19	34.29	0
APPROACH	30	4.0	1.05	0	0.54	11.39	0
IDLE	7	26.0	0.33	0.89	14.71	5.11	0

Rolls Royce  
Trent 895  
from 1994

TAKE-OFF	100	0.7	0.41	0.06	0	11.61	21.9
CLIMB OUT	85	2.2	0.33	0.06	0	10.14	9.2
APPROACH	30	4.0	0.12	0.13	1.9	6.86	3.1
IDLE	7	26.0	0.05	3.95	42.6	3.82	3.1

General  
Electric CF34-  
3A tested in  
March 1991

TAKE-OFF	100	0.7	4.69	0.04	0.08	50.34	4.1
CLIMB OUT	85	2.2	3.67	0.03	0.07	35.98	2.5
APPROACH	30	4.0	1.13	0.06	1.98	16.5	1.45
IDLE	7	26.0	0.38	4.24	39.11	5.19	0.87

GE90-115B  
tested in  
November  
2003

\* above zero but to low round above zero.

Source:- CAA.

**Appendix 6 – Manufacturer Recommended Passenger to cargo configuration by aircraft.**

Aircraft	Passenger numbers	Bulk hold capacity (m <sup>3</sup> )
737-600	132	20.4
737-900	215	51.7
767-200 ER	255	82.9
767-400 ER	375	132.3
767-300F	0	438.2
777-200	440	151
777-200F	0	653
787-3 Dreamliner	330	124.6
A300-600	266	23
A300-600F	0	112.7
A310	220	9.0
A321	185	51.7
A330-200	293	13.7
A380	525	18.4
A380F	0	157.4

Source: Boeing and Airbus

**Appendix 7 – Example fuel burn statistics taken from actual flights which took place in early April 2008.**

Destination	From	Aircraft	Fuel Burnt (kg)	Distance (nm)	Fuel Cost (US\$)	CO <sub>2</sub> emissions per passenger km (kg)
Glasgow	London Heathrow	A319	2,300	298.96	2,451.34	0.1059
Singapore	London Heathrow	A380	151,900	20,142.17	161,895.02	0.0841
London Heathrow	Rome	Airbus A320	3,000	2,706.91	3,197.40	0.0432
Rome	London Heathrow	Airbus A320	5,760	2,706.91	6,139.01	0.0830
New York	London Heathrow	Boeing 747-400	62,000.00	10,252.27	66,079.60	0.0675
London Heathrow via Hong Kong	Sydney	Boeing 747-400	109,500.00	31,507.96	116,705.10	0.0388
Hong Kong	London Heathrow	Boeing 747-400	118,000.00	17,823.55	125,764.40	0.0739
Sydney via Hong Kong	London Heathrow	Boeing 747-400	133,700.00	31,507.96	142,497.46	0.0474
London Heathrow	Madras	Boeing 777	58,500	15,241.68	62,349.30	0.0562
Singapore	London Heathrow	Boeing 777	60,900	20,142.17	64,907.22	0.0442
Madras	London Heathrow	Boeing 777	74,700	15,241.68	79,615.26	0.0717

Data was taken from a random sample of actual fuel load figures on flights taken in April 2008 from and to London Heathrow. CO<sub>2</sub> figures are calculated using the widely accepted ratio of 1 kg of Jet A1 fuel produces 3.16 kg's of CO<sub>2</sub>. Calculations per passenger are based on manufacturers recommended passenger load numbers.