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University of ULSTER

NI Air Connectivity:

Phase One

A Literature Review by NICEP

Department of Enterprise, Trade and Investment
www.detini.gov.uk

Northern Ireland Centre for Economic Policy

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1. Introduction

Background

1. DETI, in partnership with DFP, is undertaking an Air Connectivity Study to identify options to improve Northern Ireland's air connectivity for business and inbound tourism markets.

2. As a first stage, DETI has requested that the Northern Ireland Centre for Economic Policy (NICEP) complete a literature review of published research on air connectivity and the relevant factors influencing the decision making of both passengers and airline route planning. As part of this Phase One initial review, NICEP is to summarise the evidence identified on the impact of Air Passenger Duty (APD).

3. This literature review will be used to inform Phase Two of the Air Connectivity Study, which will examine in detail the range and influence of factors which impact on Northern Ireland's air connectivity.

Structure of Literature Review

4. This report is structured as follows:

- Section 2 – The economic impact of the aviation sector and the importance of connectivity;
- Section 3 – Passenger growth forecasts;
- Section 4 – Price sensitivity to passenger demand (Elasticity);
- Section 5 – Factors influencing airline decision making; and
- Section 6 – Air Passenger Duty (APD).

2. The economic impact of the aviation sector and the importance of connectivity

Introduction

5. The aviation sector delivers significant economic benefits to the UK. These benefits are two-fold, in the first instance they relate to the **aviation sector's economic footprint** (i.e. activity undertaken within the aviation sector such as aerospace manufacturing, the delivery of aviation services and the associated capital investments made). Secondly, there are the **economic benefits of connectivity** (i.e. benefits enjoyed by the wider economy as a result of connectivity to other business and tourism markets).

6. This section of the report outlines the findings from the literature review relating to both these aspects of the economic impact of aviation.

Aviation sector's economic footprint

7. Given the size and importance of this sector, there is significant literature in this area relating to the UK. As is typical, the quantum of the contribution to GDP varies across publications but the most recent study completed by Oxford Economics[1] (OE) estimates that the sector could be worth £49.6 billion (3.6% of overall GDP) and employs 921,000 workers.

8. The OE report identified the sector as being comprised of three activity areas:

   - Airlines – transporting passenger and air freight;
   - Ground based infrastructure – including airport facilities and services provided off-site; and
   - Aerospace manufacturing – the designing, building and maintenance of aircraft.

9. In addition the economic and employment benefits are derived through three specific channels, these are:

   - Direct – the output and employment of firms in the aviation sector;

[1] Oxford Economics (2011) '*Economic Benefits from Air Transport in the UK*'

- Indirect – the output and employment supported through the sector's UK based supply chain; and
- Induced – employment and output supported by the spending of those directly or indirectly employed in the aviation sector.

Table 2.1: Aviation's economic impact to the UK

	Direct	Indirect	Induced	Total	% of whole economy
Contribution to GDP (£'m)					
Airlines	5,088	2,839	3,002	10,929	0.8%
Airports and ground services	5,917	5,845	4,334	16,096	1.2%
Aerospace	10,283	7,635	4,640	22,558	1.6%
Total	**21,288**	**16,319**	**11,976**	**49,583**	**3.6%**
Contribution to UK employment ('000s)					
Airlines	88	59	62	210	0.7%
Airports and ground services	133	128	90	351	1.2%
Aerospace	105	159	97	360	1.2%
Total	**325**	**346**	**249**	**921**	**3.2%**

Source: Oxford Economics

10. This analysis also highlights the very high labour productivity (i.e. GVA per employee) of the aviation sector.

Table 2.2: Labour productivity in the aviation sector

	Productivity (GVA per employee)
Air transport services	66,178
Aerospace	97,966
UK economy	31,585
UK Manufacturing	47,670

Source: Oxford Economics[2]

[2]Oxford Economics (2011) '*Economic Benefits from Air Transport in the UK*'

11. The productivity of air transport services (airlines and ground based infrastructure), as measured by GVA per employee is over £66k and in the aerospace industry it is over £97k. That is 112% above the overall UK economy GVA for air transport services and 216% above the overall UK economy GVA for aerospace.

12. Equivalent information for the economic impact of the aviation sector in Northern Ireland was not identified for this review.

Economic benefits of connectivity

13. Connectivity brings significant additional economic benefits such as supporting tourism, encouraging Foreign Direct Investment (FDI) and developing export markets. The impact of each of these aspects is explored in turn. However to fully understand these benefits, the concept of connectivity and the importance of hub airports is explained first.

Understanding connectivity and the importance of a hub airport

14. A hub airport typically has the following characteristics[3]:

- has a network carrier or airline alliance who base sufficient numbers of aircraft there to operate a 'hub and spoke' strategy;
- has a large route network;
- is suitably located to allow airlines to cost effectively serve passengers transferring through the hub to other destinations; and
- has appropriate facilities to handle efficient connections for passengers.

15. The hub and spoke business model of network carriers has developed as the most efficient way for airlines to transport passengers. Consolidating passenger traffic onto fewer, higher volume routes reduces the average fixed cost per passenger carried. By pooling demand from transfer (spoke) passengers, long haul route networks through the hub become viable and more affordable. Therefore the network effect of a hub brings the following benefits:

[3] Frontier Economics (2011): '*Connecting for Growth: The role of Britain's hub airport in economic recovery*'. A report prepared for Heathrow.

- Improved connectivity – it is only as a result of transferring (spoke) passengers that many long haul routes (through the hub) are viable, therefore a wider choice of routes are available;
- Increased frequency – the number of flights at the hub can be increased;
- Lower fares – economies of scale from greater numbers of passengers reduces the average cost per passenger allowing for lower fares; and
- Increased competition – with increased demand, a number of carriers may be sustained on key routes which can introduce competition resulting in increased service choice and lower fares.

16. From a Northern Ireland perspective therefore, the local demand for many long haul destinations would not be sufficient to make a direct route viable. As a result, the only option is an indirect connection through a hub which can be served more frequently and at a lower ticket price. This reflects comments made by the NI Chamber of Commerce who stated "*Northern Ireland's economic growth in both the near and longer term remains dependent upon the maintenance of adequate Heathrow services to facilitate flexible global connectivity*.[4]"

17. The UK's connectivity is significantly enhanced by Heathrow's status as an international hub airport, which serves 75[5] destinations world-wide that are not serviced by any other UK airport. The Frontier Economics (2011) analysis suggests that approximately "*three quarters of the long haul routes operating from Heathrow carry a sufficient number of transfer passengers to imply that those services might not be viable without them.*" This is also supported by Visit Britain[6] research which shows that 73% of overseas visitors arrive by air and they account for 84% of all inbound visitor spending.

18. It is this international connectivity which is central to the Northern Ireland Executive's desire to ensure that the Belfast – Heathrow service is maintained. However, Heathrow is currently operating at 98%[7] capacity and as a result short haul routes are being squeezed out compared to its European competitors.

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[4] NI Chamber of Commerce (29 January 2013): '*Press Release: Air Passenger Duty – Heathrow access still a key component for economic growth*'
[5] Heathrow (2013): '*Heathrow: best placed for Britain*'
[6] Visit Britain (April 2013): '*Aviation Connectivity and the Economy: Response by VisitBritain*'
[7] Source: Heathrow

Table 2.2: Short haul routes served by European hubs at least 3 times per day

	Short haul routes served
Paris Charles de Gaulle	78
Frankfurt	74
Amsterdam	67
Madrid	63
London Heathrow	46

Source: Frontier Economics

19. Within the UK regions this is also an acute problem. As reported in the House of Commons All Party Parliamentary Group for Aviation[8], only 6 UK regional airports have a service to Heathrow compared with 22 to Amsterdam. It was also noted that Air France and Lufthansa have also been increasing their services to UK regional airports to encourage UK traffic to connect over their hubs in Paris and Frankfurt.

20. The capacity constraint at Heathrow is also impacting Heathrow's ability to develop new international connections. The Frontier Economics (2011) analysis suggests that the Heathrow "connectivity gap" includes 45 long haul destinations which could be viably added to airline networks, including 15 destinations in emerging markets.

21. As a consequence the Heathrow capacity constraint impacts Northern Ireland (and the other UK regions) in two ways. Firstly in terms of frequency of access to Heathrow and secondly in terms of our connectivity to international destinations.

22. A final comment on the Heathrow hub airport point was raised in consultations undertaken as part of this literature review exercise and relates to the conflict between public and private benefit. It has been suggested that it is in the financial interests of BAA Ltd (the company which operates Heathrow Airport) to operate the airport at near full capacity because it can then maintain higher charges and thereby maximise return on their asset. Incumbent airlines are also complicit in this as the value of their slots at Heathrow would be eroded if there was a significant increase in the supply of slots available. As a result both the airport and airlines are not incentivised from acting in a way which benefits the economy as a whole.

[8] House of Commons All Party Parliamentary Group for Aviation (2012): '*Inquiry into Aviation Policy and Air Passenger Duty*'

Additional economic benefits of connectivity

23. There is significant literature on the economic benefits of aviation connectivity and from the review completed, the most recent and comprehensive study at a UK level was completed by the Airports Commission[9]. In addition, a Northern Ireland specific report was completed by Oxford Economics[10]. The findings from these reports are summarised below.

24. The benefits to the economy of connectivity have been identified across five channels.

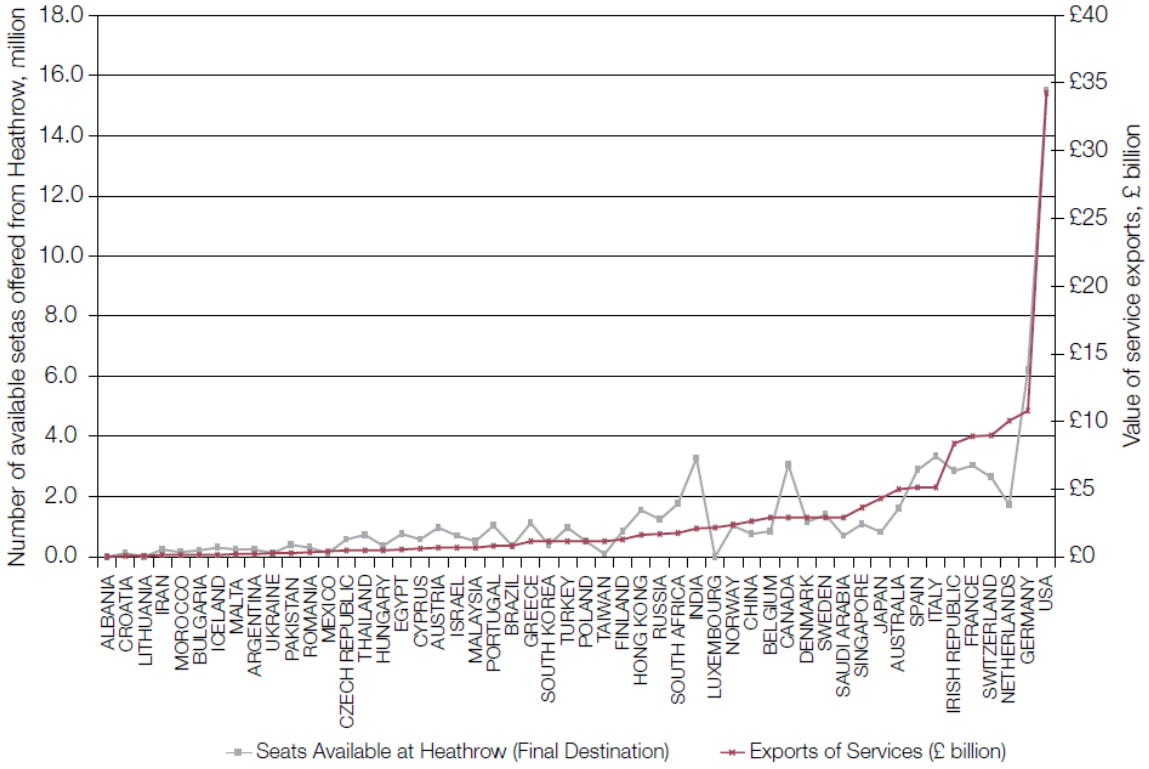
i) Trade in services

25. The UK has run a significant trade surplus in services for many years and particularly strong sectors include: financial services; insurance; and creative industries. These sectors operate in a global market place and are reliant on aviation to serve their international client base.

26. Evidence also supports a correlation between connectivity and levels of trade. Frontier Economics[11] identified that in the eight fastest growing emerging markets, "*UK businesses trade 20 times as much with countries where there are daily flights, than with those of less frequent or no service*." In addition, the Airports Commission completed an analysis of service exports and the numbers of seats available from Heathrow. See Figure 2.1 below.

[9] Airports Commission (2013): '*Discussion Paper 02: Air Connectivity and the Economy*'. (The Commission has invited relevant stakeholders to provide further evidence which should augment the findings of their research, however this is not yet available.)
[10] Oxford Economics (2012): '*Connecting for Growth: the regional value of connectivity – Northern Ireland*'
[11] Frontier Economics (2011): '*Connecting for Growth: The role of Britain's hub airport in economic recovery*'. A report prepared for Heathrow.

Figure 2.1: Value of UK services exported and number of seats from Heathrow



Source: *DfT statistics, Airports Commission analysis*

27. It is important to understand the causal relationship between connectivity and trade, but it is likely to work in two ways – the strong trade links encourage the provision of greater provision on that route, but also connectivity is an important determinant in establishing and developing trade links. The British Chambers of Commerce[12] completed a survey of business leaders in the high growth emerging markets of Brazil, China, India, South Korea and Mexico. In this survey 92% responded that direct links were important to inward investment decisions. Furthermore, 67% indicated that better connections from their home countries to France, Germany and Holland would make them more likely to do business in those countries rather than the UK.

[12] British Chambers of Commerce (26 January 2012) 'Press Release: *UK will miss out on investment because of poor air connections*'

ii) Trade in goods

28. Air freight carries only a very small proportion of UK exports by weight (approx 1%) but 22% when measured by value, of which 65% travels through Heathrow. In 2010 the total value of UK goods exported by air was £60 billion. To put this in some context, the Airports Commission identified that: "*On average, each flight from Heathrow to the BRIC countries contains £400k in exports and each flight to China specifically is worth over £1 million.*"

29. Air freight is a key element of the supply chain in the advanced manufacturing sector (an area in which the UK is seeking build a competitive strength) and typically these goods are high value, light, compact and perishable (e.g. medicines).

30. In this analysis, it is important to recognise that passenger connectivity and air freight connectivity are interlinked. Belly-hold freight (i.e. freight shipped in the belly-hold of passenger aircrafts) makes up the majority of all air freight out of the UK. As a result, if aviation connectivity for passengers consolidates or declines, this will have a knock-on impact in the freight market in terms of costs and frequency. This in turn impacts the UK's competitive position in manufacturing.

Northern Ireland statistics:

- Total goods exported is £3.2 billion (excluding Republic of Ireland) and 20% to emerging/ growth markets;
- Exports via air freight £1 billion (31% by value);
- 60% of exports by air go via a hub airport to their final destination.

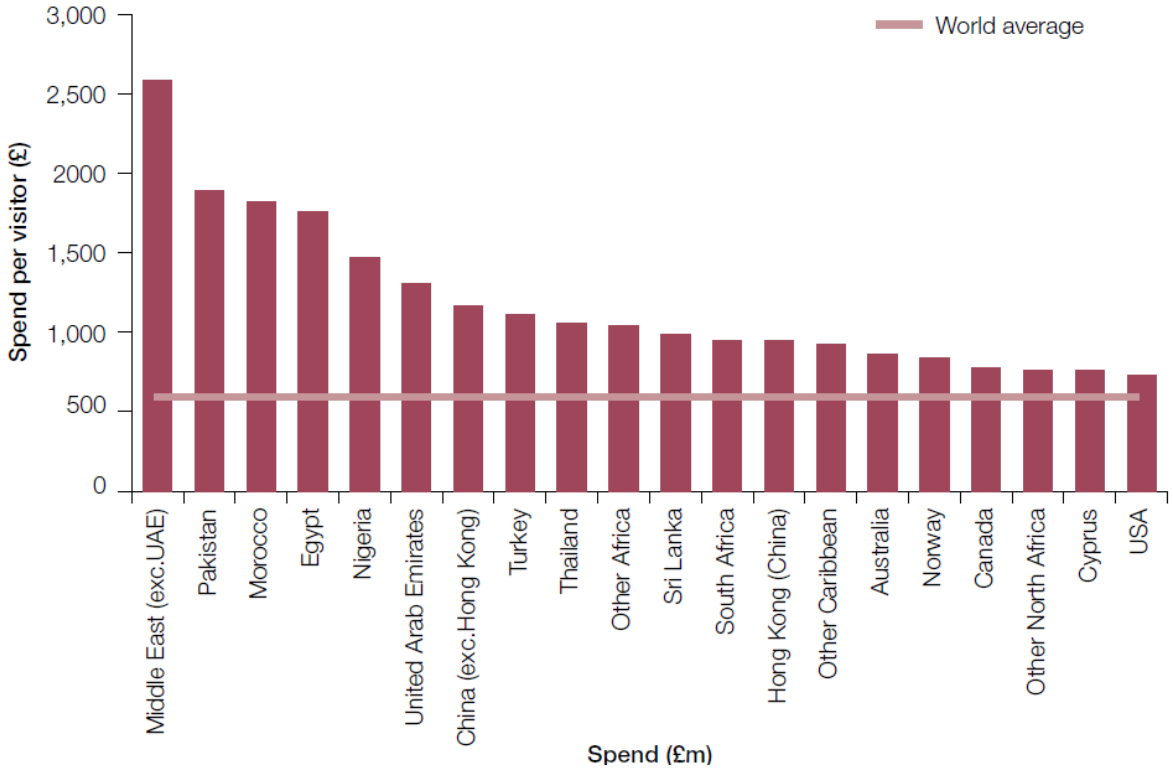
Source: Oxford Economics (February 2012): '*Connecting for growth – the regional value of connectivity*'

iii) Tourism

31. Aviation plays a critical role in supporting in-bound and outbound tourism in the UK. In 2011, nearly three quarters of the 31 million visits to the UK arrived through airports. Total earnings from overseas visitors in that year were £18 billion and 84% of this was spent by people travelling by air[13].

32. The UK Government is currently focusing its tourism promotion efforts on the emerging market countries and this approach is supported by Office of National Statistics (ONS) and the International Passenger Survey (IPS) statistics analysed by the Airports Commission. Figure 2.2 below shows the tourist spend per visitor by country of residence.

Figure 2.2: Tourist spend per visitor by country of residence



Source: ONS, IPS 2011 and Airports Commission analysis

33. As a result, connectivity to these emerging markets is critical to the development of the tourism market.

[13] Airports Commission (2013): '*Discussion Paper 02: Air Connectivity and the Economy*'.

34. The literature also made a number of references to the so-called 'tourism deficit' (i.e. where the number of outbound visitors and spend exceeds inbound visitors and spend, thereby increasing the trade deficit). As identified by the Airports Commission, in 2011 UK residents spent £32 billion on visits abroad (compared to £18 billion spent by inbound tourists).

35. This is used by some policy makers to highlight the disadvantage of improving connectivity. However, the Association of British Travel Agents (ABTA)[14] commissioned research to assess the economic value of outbound travel. In their analysis, they suggest that domestic spend on outbound travel products and services are broadly equivalent to spend by UK tourists abroad. Their domestic spend touches many parts of the economy including retail, transport, tour operators and travel agents.

iv) Business Investment

36. There is significant evidence to support the notion that connectivity is a critical factor in the investment decisions of companies. The British Chambers of Commerce study noted above and also the European Cities Monitor 2010[15] survey indicated that 51% of companies consider it is an essential factor when deciding where to locate a business. This was one of the big four essential factors in making an investment decision, the others being:

- easy access to markets, customers or clients [also linked to connectivity];
- availability of qualified staff; and
- the quality of telecommunications.

Northern Ireland statistics:

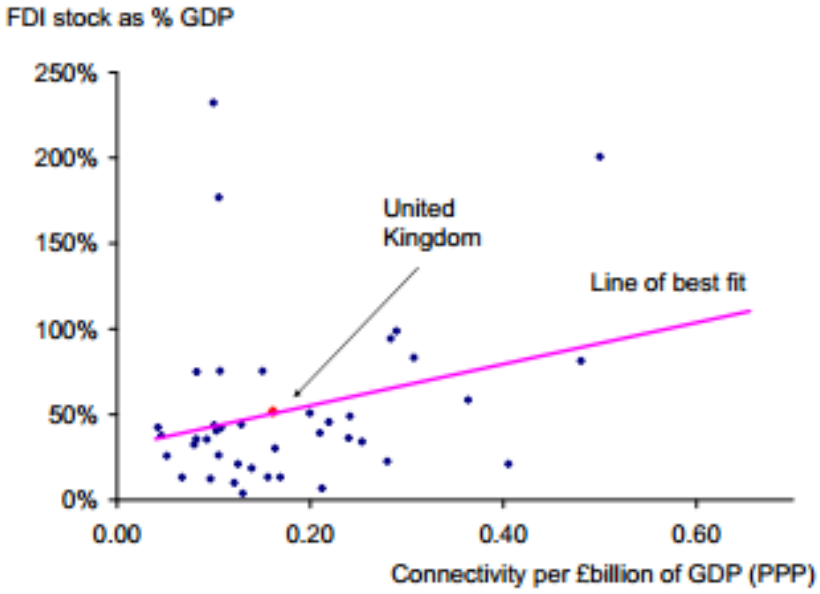
- There are a total of 79,050 jobs in foreign owned companies in Northern Ireland (9.4% of the total private sector workforce)
- 54% of those jobs (42,250) are connected to their international headquarters via an international hub airport;
- The remaining 46% are connected via a direct flight.

Source: Oxford Economics and ONS

[14] ABTA (2012): '*Driving Growth – The Economic Value of Outbound Travel*'
[15] Cushman and Wakefield (2010): 'European Cities Monitor 2010'

37. The following chart produced by Oxford Economics shows the correlation between FDI and connectivity.

Figure 2.3: Correlation between FDI and connectivity



Source: Oxford Economics and IATA

38. The analysis therefore supports the notion that business investment is higher in regions/ countries with higher levels of connectivity.

v) Innovation and Productivity

39. Finally, it is argued throughout the literature that aviation connectivity may also facilitate innovation and productivity through the following means:

- the effect on domestic firms from access to foreign markets – the increased competition and choice in both home and domestic markets encourages firms to specialise in areas where they have a comparative advantage. Through international trade, companies can better exploit the opportunities provided by economies of scale, thereby reducing costs and prices for domestic consumers;

- increasing competition and choice in the home market – this requires domestic firms to reduce their costs and adopt international best practice encouraging innovation and productivity improvements; and

- greater movement of investment capital and workers between countries – access to foreign markets provides UK firms with access to new technologies, capital and an international labour pool. Clearly there is also a risk that capital (financial and

human) could leave the UK which would negatively impact the economy, but this risk should also encourage employers and policy makers to create an environment/ society where all people can live and work and reach their potential.

Summary of economic impact of aviation

40. The five channels of economic benefit identified are all consistent with the NI Economic Strategy[16] in terms of:

- Business Growth – promoting investment and increasing visitor numbers; and
- Competing Globally – promoting inward investment, developing air links, increasing the value of exports (and in particular to emerging markets).

41. Aviation delivers significant economic benefits to the UK as summarised below.

Table 2.3: Summary of findings

Aviation sector's economic footprint
• Contribution to GDP: £49.6 bn
• Contribution to UK employment: 921,000 jobs
Economic benefits of connectivity
• Trade in services – UK trades 20 times as much with countries where there are daily flights, than where there is a less frequent or no service
• Trade in goods – value of goods exported by air £60 billion. Each flight to China is worth approx. £1 million in exports
• Tourism – almost 75% of the 31 million visitors to the UK arrived by air. Visitors from some emerging markets spend significantly more per visitor than those from many traditional tourism markets.
• Business Investment – air connectivity is critical to the location of company investment decisions
• Innovation – connectivity opens local companies to international markets and competition thereby improving innovation and productivity of local companies and improved quality and prices for local consumers.

[16] Northern Ireland Executive: Economic Strategy – Priorities for sustainable growth and prosperity

3. Passenger growth forecasts

Introduction

42. This section of the report provides an overview of passenger growth forecasts in the coming decades. In particular this includes:

- Understanding market maturity and saturation;
- Factors affecting supply and demand for air travel; and
- Passenger forecast levels.

Understanding market maturity and saturation

43. In 2010 the Department for Transport (DfT) commissioned the University of Westminster to assess the levels of market maturity in air transport in the UK[17]. This study was then used by the DfT to inform their assumptions for modelling air passenger demand.

44. In simplistic terms, they defined a market approaching maturity as one which is characterised by declining growth rates and a saturated market exists if no further growth is possible. The key metric they use to determine maturity in the market is Income Elasticity of Demand (YED)[18] as follows:

- Growth market: YED > 1 – i.e. if income increases by 1% then demand will increase by more than 1%;
- Mature market: YED =< 1 and YED > 0 – i.e. if income increases by 1% then demand will increase but by 1% or less;
- Market Saturation: YED = 0 – i.e. any increase in income does not impact demand, there is no further growth in this market.

45. The DfT study concluded that "*at a global level there is little evidence of the market for air travelling maturing*". However, for the **short haul UK air travel market, including domestic air travel, it is increasingly likely that these markets are entering maturity**. In addition, the coverage of Low Cost Carrier (LCC) short haul

[17] University of Westminster (July 2010): '*DfT Air Transport – Market Maturity – Summary Report*'
[18] At a whole economy level, Gross Domestic Product is used as a proxy for income.

routes to and from the UK may have reached a maximum (however passenger numbers on these routes could continue to increase in line with income). But conversely, **the evidence suggests that the long haul market is NOT reaching maturity**.

Factors affecting supply and demand for air travel

46. The literature review identified the following factors which could potentially impact the **supply** of air travel:

- Challenging market conditions – given the challenging environment the industry has had to overcome in the last decade (such as: increasing fuel costs; increasing environmental costs/ taxes; and increasing security measures) airlines will only be maintaining and selecting routes which they consider to be the most profitable;

- Increasing environmental concerns – this impacts both airlines and airports. The introduction of the EU Emissions Trading Scheme (ETS) places a cost on the airlines which may incentivise investment in other geographies. In addition, infrastructure development has been constrained as a result of environmental and associated planning restrictions (e.g. expansion of a third runway at Heathrow);

- Airspace congestion – although noted in some instances, it is accepted that improvements in technology, such as satellite navigation, could help to alleviate the problem.

47. The DfT aviation forecasts[19] identifies the two main factors impacting **demand** for air travel:

- Level of income – this is discussed above in terms of the extent of market maturity. DfT forecasts are based on a return to long term growth rates in the UK economy; and

- Cost of airfares – there has been a long term reduction in cost of airfares over the last two decades, however the DfT forecast that this trend will not continue as airlines do not have the same scope to reduce operating costs and the sector must meet increasing environmental costs.

[19] Department for Transport (January 2013): '*UK Aviation Forecasts*'

48. The final element in the DfT's passenger forecast model relates to the allocation of passengers to airports. The literature review identified two main drivers in passenger choice of airport:

    - Surface access costs – the cost of travelling to airports. Passengers are more likely to use an airport that costs relatively less in terms of both time and money; and
    - Frequency of services – the frequency of services offered at airports. Passengers are more likely to use an airport which has more regular services.

49. Interestingly, at an aggregate level, the cost of air fares was not a determinant in airport choice as these were seen to average out over the year.

50. Where capacity constraints became relevant in a forecast analysis, the cost of accessing the airport would increase and as a consequence passengers would either choose another airport or choose not to fly.

Passenger forecast levels

51. The DfT have developed a National Air Passenger Allocation Model to forecast passenger numbers. These numbers are forecast to grow in the 1% to 3% p.a. range between 2010 and 2050, which is much lower than the 5% annual growth seen over the last 40 years. A summary is provided in the table below.

Table 3.1: UK Terminal Passenger Forecasts (millions)

	UK (unconstrained)	UK (constrained)	Belfast Intl (constrained)	Belfast City (constrained)
2011	211	211	4	2.4
2030	320	315	7	3.7
2050	480	445	10	5.8

Source: DfT (January 2013), UK Aviation Forecasts (Central forecast scenario)
Note: Constrained scenarios assume no new runways built in the UK

52. This sets out the latest DfT forecasts and represents a reduction of 7% in passenger numbers from the previous August 2011 forecasts. This was as a result of changes to assumptions relating to airport capacity, fuel efficiency (and the associated cost of carbon) and exchange rates (£:$ for calculating cost of oil).

53. Therefore even in a constrained scenario, air traffic at both the Belfast airports is forecast to grow significantly.

4. Price sensitivity to passenger demand (Elasticity)

Introduction

54. The price elasticity of demand measures the sensitivity of customer demand to a change in the price of the product or service purchased. Therefore if a product is highly elastic a small increase in the price will have a proportionately large impact on the quantity purchased (e.g. a 1% increase in the price would result in a fall in demand of more than 1%). Other products may be inelastic, where an increase in price would have a proportionately small decrease in demand.

55. There is significant literature available assessing the elasticity of demand for air travel, **showing widely varying estimates**. This section of the report provides an overview of the factors determining elasticity and sets out a rationale for the differing results identified. These factors include:

- The travellers decision making process;
- Inbound and outbound travellers; and
- Other factors impacting elasticity.

The travellers decision making process

56. PwC completed an analysis of elasticity literature for their assessment on the impact of air passenger duty in the UK[20]. In this study they set out a framework[21] showing how elasticities varied depending on the underlying purpose of travel and where an individual is in the decision making process (see Figure 4.1 further below). These two aspects are discussed below:

- Purpose of travel – this is split into three underlying reasons identified by the ONS: holiday; visiting friends and family; and business;

[20] PwC (February 2013): '*The Impact of Air Passenger Duty*'. This study was commissioned by four airlines: British Airway; Virgin Atlantic; Ryanair; and easyJet.
[21] The framework is based on the work of De Mellor (2005) which is itself based on Deaton and Muelbauer's (1980) Almost Ideal Demand System (AIDS) for UK tourism.

- Stage in the decision making process – there are three stages in the decision making process:

  i. Examine budget constraints – once the need to travel is established, the individual identifies an overall budget for the trip;

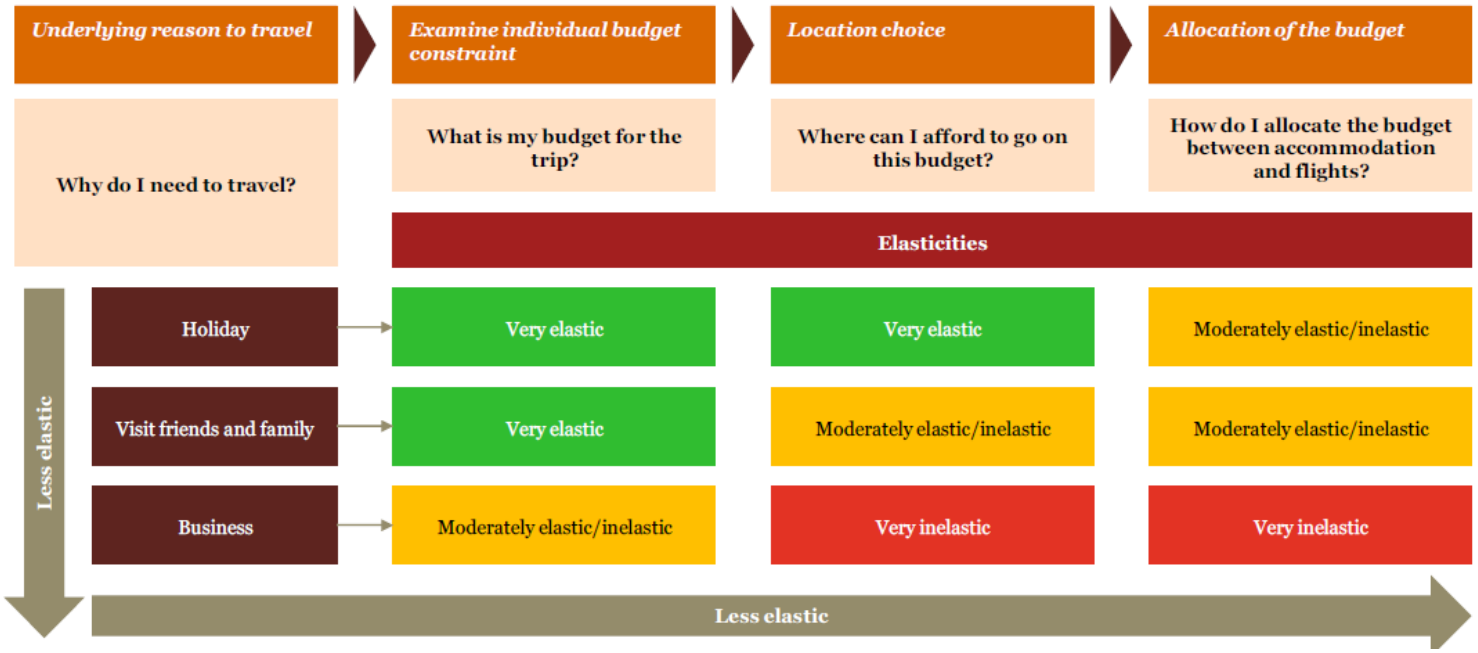
  ii. Location decision – the individual then chooses a location within the set budget; and

  iii. Allocation of budget – the individual then decides how to allocate their budget across the major expenditure items of the trip (flight, accommodation, etc.).

57. Each stage is followed sequentially and it is suggested that the purchase decision is at its most sensitive to the price of the trip at the beginning of the decision making process. At the last stage, when the flight is purchased, the decision is at its most inelastic.

58. This suggests greater emphasis should be placed on 'Tourism demand elasticity' which measures the sensitivity of consumers to a change in the overall cost of the tourism product, rather than 'Own-price elasticity of demand' which measures the sensitivity of consumers to a change in the ticket price only.

Figure 4.1: Elasticities framework based on the motives behind decision to travel



Source: Reproduced from PwC (February 2013): 'The Impact of Air Passenger Duty'

Inbound and Outbound travellers

59. Elasticities will also vary depending on whether travellers are inbound or outbound. These are discussed in turn.

Inbound elasticities

60. The Department for Culture, Media and Sport (DCMS) commissioned a study in 2007[22] which calculated inbound elasticities. Table 4.1 below sets out both income and price elasticities across a number of tourism markets and also across rationale for travel.

Table 4.1: Weighted average elasticties across country and rationale for travel

	Income Elasticity	Price Elasticity
France	1.37	-0.53
Germany	1.35	-0.33
Spain	1.43	-1.38
The Netherlands	1.48	-0.61
Ireland	1.72	**-1.86**
Italy	1.37	0.49
United States	2.01	-0.42
Holidays	1.70	-1.23
Business	1.70	0.18
VFF	1.58	-0.93
Study	1.40	-0.42
Overall Average	1.65	-0.61

Source: DCMS (2007), The Drivers of Tourism Demand in the UK

61. The following comments are made in respect of these findings:

- The Ireland (RoI) elasticity is the highest of the group assessed showing a much higher sensitivity to price changes than for example Germany or the US. As an island economy, Ireland would share many similar characteristics with NI;

[22] DCMS (2007): '*The Drivers of Tourism Demand in the UK*'. A report by the University of Nottingham, Blake and Cortes-Jimenez.

- Price elasticities vary more significantly than income elasticities, Spain and Ireland are the most price sensitive and Germany and the United States are the least price sensitive. Italy is an outlier in showing a positive price elasticity and DCMS explain this finding as a result of a positive elasticity for both Italian business and VFF travel;
- Unsurprisingly business travel is found to be the least price sensitive and holidays the most price sensitive;
- Income elasticities are relatively similar across countries (varying from 1.35 for Germany to 2.01 for the United States) and across reasons for travel;
- This is a summary table and the DCMS report also provides greater detail in terms of the breakdown of the elasticities on rationale for travel across each country.

Outbound elasticities

62. In 2010 a literature review completed by Song, Kim and Yang[23] published elasticities for a number of UK outbound destinations. Table 4.2 below shows a summary of the range of price elasticities identified.

Table 4.2: UK Outbound Price Elasticities

	Price elasticity range
France	-1.079 to -1.163
Germany	-1.251 to -4.001
Spain	-0.496 to -2.988
Belgium/ Luxembourg	-0.532
The Netherlands	-0.23
Ireland	0.947
Italy	-1.013 to -1.184
Greece	-0.21 to -9.9
United States	0.16
Australia	-2.086
South Korea	-0.018
Hong Kong	-0.492 to -0.537

Source: Song, Kim and Yang (2010)

[23] 'Confidence Intervals for Tourism Demand Elasticity', Annals of Tourism Research 37, pg 377-396, Song, Kim and Yang, 2010

63. The following comments are made in respect of these findings:

- These elasticities were sourced from studies completed between 2000 and 2008 and each using their own specific model. The literature review also suggests that there is a trend towards reducing levels of price elasticity over time, for example due to the emergence of low cost carriers the relative cost of flights as a percentage of overall income has fallen;

- Long haul passengers appear to be less price sensitive than short haul passengers. This is mirrored somewhat in the inbound DCMS study which showed the US to be less price sensitive to most short haul destinations.

Other factors impacting elasticity

64. In addition to the points identified above, a number of other factors have been identified in the research which impacts the elasticities of demand for air travel. These were identified in and the findings are summarised briefly below.

Level	Description	Source
Fare class level	In this context, travellers choose between different fare classes (first class, business class, economy, etc.). At this level, the elasticities are arguably highest as travellers have a wide range of options, they can easily switch between fare-class levels, airlines, use of another mode of travel or simply chose to not travel.	IATA (2007)[24]
Carrier level	The elasticities at the carrier level reflect the overall demand curve facing each air carrier on a given route. In situations where there are a number of air carriers serving the route, the demand elasticity faced by each carrier is likely to be fairly high - if an air carrier increases it fare unilaterally, it is likely to lose passengers to other carriers operating on that route. This may also be the case where a carrier has a monopoly on a given route as passengers may have connecting options.	IATA (2007)
Route level	At the route level (e.g., Heathrow–Paris CDG), the elasticity response might be expected to be generally lower than at the fare class or carrier level. Travellers faced with a fare increase on all carriers serving a route (e.g. due to an increase in airport fees), have	IATA (2007)

[24] IATA (2007): '*Estimating Air Travel Demand Elasticities*'. A report by InterVISTAS

	fewer options for substitution. But, they may still chose to travel on an alternative route, travel by another mode, or not travel.	
National level	At the national level, fare elasticities would be expected to be lower still, as travellers have fewer options for avoiding the fare increase. For example, if a government imposed a new or increased tax on aviation, travellers could only avoid this increase by using another mode (and/ or fly from another jurisdiction), or not travel. The report also indicated that national elasticities of demand was -0.8 was much smaller than "city-pair" (or airport) level elasticities of demand, which was -1.4.	IATA (2007)
Pan-National level	This represents the most aggregated level considered, in which a fare increase is imposed at some pan-national level; for example, the European Union imposing an aviation tax on all its member states. In this case, the options for avoiding the fare increase are even further reduced, so therefore the elasticity would be expected to be lower.	IATA (2007)
Regional level	At a regional level, aviation demand in London and the South East of England was "fairly inelastic" and passengers elsewhere in the UK were significantly more price sensitive. As a consequence regions such as NI are more significantly impacted by price increases and imposition of taxes such as APD.	House of Commons (2012)[25]
Long term and short term	Long-run price elasticities are seen to be higher than short run elasticities (i.e. passengers become more price sensitive over time).	Brons, Pels, Nijkamp, Rietveld (2002):

Sources: IATA (2007): 'Estimating Air Travel Demand Elasticities'; House of Commons: All Party Parliamentary Group for Aviation (2012): 'Inquiry into Aviation Policy and Air Passenger Duty'; Brons, Pels, Nijkamp, Rietveld (2002): 'Price elasticities of demand for passenger travel : a meta-analysis'

[25] House of Commons: All Party Parliamentary Group for Aviation (2012): '*Inquiry into Aviation Policy and Air Passenger Duty*' (Evidence provided by York Aviation)

Overall conclusions on elasticity

65. Determining levels of elasticities is complex and the literature review highlights the wide range of values which have been calculated in different studies. In particular, the level of elasticity can depend on: the reason for travelling, the stage in the decision making process, the origin of in-bound flights and destination of outbound flights (including long haul and short haul); the fare class; and individual airlines. Long-term elasticities are greater than short term elasticities and these also change over time. Finally, there is an important distinction between the own-price of demand (i.e. the price elasticity of the flight) and the overall product price elasticity of demand (i.e. the price of the overall total basket of costs).

66. As a consequence, when developing policy in an NI context and modelling the impact of price changes, the appropriate elasticities to apply should be based on current primary evidence captured for the purpose of the research rather than relying on previous elasticity calculations which may be out of date and/ or produced for a different set of circumstances.

5. Factors influencing airline decision making

Introduction

67. This section of the literature review sets out the factors identified which influence an airline's decision making in respect of introducing, maintaining or discontinuing the provision of an individual route. This section firstly considers the factors important to airlines and then secondly outlines potential steps that airports and government bodies can take to attract airlines and new routes.

Factors important to airlines

68. Establishing a new route can be a risky and very expensive undertaking for an airline, by way of example, the annual operating cost for a Boeing 767-300 (220 seats) operating a twice daily service is in the region of $50 million[26]. Given the difficult economic climate and against a backdrop of increasing costs, the literature review[27] identified the following factors an airline will consider:

Profitability

69. Profitability is typically based on load factors (% of seat occupied), yield (profitability), increasing economies of scale of an airport base, improving aircraft utilisation through being able to deploy existing aircraft on more routes and improved flight/ cabin crew utilisation.

70. However, in achieving increased profitability, airlines can pursue a range of different strategies and the following approaches are used in making new air route decisions:

- Prioritised in terms of profitability – airlines will consider a range of route options and those with the highest estimated profitability will be established;
- Expand the reach of the network – this is often a longer term decision which may require investment in a route to establish a new hub airport, where a number of routes could become established over time;

[26] InterVISTAS (2010): *'Airline Routes: How you can influence their development'. A presentation for the 49th ICCA Congress and Exhibition*
[27] Source for this section is the InterVISTAS (2010) report unless otherwise stated.

- Cost base at an airport – a lower cost base in terms of airport fees and taxes improves profitability and attractiveness of a base.

Network connectivity

71. Improved connectivity within an airline's existing network has a much lower set-up cost than an airline establishing itself at a new airport in its network. Expanding operations to a new airport is clearly a much bigger strategic decision than establishing a route between two airports in the airlines' current network.

Interlining and code sharing

72. A route's viability and profitability may depend on interlining (transferring) passengers. Therefore an airline may consider a route as more attractive if there is potential to draw in transfer passengers. This could also link with the potential for a code sharing partnership at an airport in order to increase passenger numbers. As a result hub airports find it much easier to attract airlines and new routes.

Infrastructure requirements at airports

73. Some airport operators may need to undertake investment in their infrastructure before certain aircraft types can use their airport. The scale of investment and timing of the development works is an important consideration for airlines.

Competitor reasons

74. An airline may make an investment decision based on the need to pre-empt the move of a competitor (e.g. to gain first mover advantage) or as a consequence of the move of a competitor (e.g. to avoid significant market share being lost).

Considerations for Airport operators and Government bodies seeking to improve connectivity

75. The following actions have been identified for airport operators in partnership with Government to improve connectivity and attract airlines and new air routes to a region. These include:

- Establishing an Air Route Development Strategy;
- Developing new route business cases; and
- Identifying appropriate incentives (and ways to fund them).

Establishing an Air Route Development Strategy

76. Government and the airports may have different priorities in this regard. The priority for Government is to generate wider economic development (taking cognisance of environmental concerns), and therefore this will likely focus on developing air routes to destinations which will encourage increased business activity and inbound tourism. Airports however have a greater focus on total passenger traffic and therefore may wish to develop routes to destinations with significant levels of outbound tourism if passenger levels would be higher.

77. As a partnership approach is required between Government and the airports and a single strategy would typically include the following:

- Benchmarking of air services with other equivalent regions and identify potential gaps in service provision;
- Identify new route opportunities which meet strategic objectives of economic development;
- Identify airlines where there is strategic alignment to operate those routes (e.g. currently operate from either the origin or destination airport, consistent with the aim of expanding the airlines' network and operates appropriate aircraft type/ size);
- Assess the viability of the potential air routes identified, in terms of demand likely demand levels; and
- Prioritise the best route opportunities and target the airlines.

Develop new route business cases

78. The purpose of the business case is to provide the airlines with as much information as possible to assist in their decision making process. The more comprehensive, accurate and up to date as possible, the greater the confidence the airlines should have in its conclusions. At a high level, the business case should include the following information.

Topic areas	Detail
Catchment area profile	• Demographics • Economy • Tourism data (e.g. traveller origins and destination)
Airport profiles	• Facilities • Traffic levels
Market profile	• Market sizes (tourism, business, freight) • Top city pairs • Traffic leakage (to Dublin)
Service options	• Frequency • Schedule • Aircraft type • Routing
Route analysis	• Market share • Load and yield potential (historic trend and forecasting of passenger and freight demand) • Stimulation potential • Self-diversion • Point-to-point and interlining potential
Financial analysis	• Charges (landing charges and taxes) • Operating costs (fuel, maintenance, customer service staff) • Revenue (sales, potential incentives)
Strategic considerations	• Expanding network (potential for network growth) • Code sharing potential • Competitor analysis (including assessment of existing services)

Source: InterVISTAS (2010), 'Airline Routes: How you can influence their development'; DETI analysis

Identify appropriate incentives (and ways to fund them)

79. Given the wider economic benefits which can accrue from air route connectivity, some regions have aggressively pursued airlines to establish routes to major economic destinations. Incentives are typically designed to impact either supply and/ or demand for air services and listed below are examples of typical incentives provided:

- Airport fee concessions;
- Start-up cost re-imbursement;
- Operating cost re-imbursement;
- Direct subsidy;
- Revenue guarantees;
- Marketing support;
- Ticket trusts/ travel banks.

80. The incentives offered should be flexible to meet the needs of different airlines. For example, airport fees can vary significantly as a percentage of the total expenses for different airlines (British Airways: 2.99% and FlyBe: 25.54%[28]). Therefore airport fee concessions may only be an appropriate incentive for some airlines.

81. In terms of funding these incentives, a partnership approach between Government and the airports has been used in the past. Northern Ireland had the DETI funded Air Route Development Scheme (ARDS), which funded the establishment of nine domestic and international routes. In addition, the Northern Ireland Executive successfully lobbied HM Treasury to have Air Passenger Duty reduced on longer haul routes to increase the longer term viability of the Newark service.

82. However the ARDS has been discontinued due to changes to EU state aid rules which severely limit the assistance which can be provided to airports and airlines. Therefore it is likely the airports themselves will have to fund a greater share of the incentives offered.

[28] Source: DETI (2007): '*Post Project Evaluation – Northern Ireland Air Route Development Fund*'

83. The 'solution' identified by InterVISTAS involves maximising non-aeronautical revenue streams such as:

- Retail and duty free;
- Food and beverage income;
- Parking;
- Loyalty and premium programmes; and
- Land development.

84. It is recommended that the funding for incentives must be viewed as an investment by airports, where the new air routes offered, increases the number of flights and passengers, which in turn will increase airport revenues.

6. Air Passenger Duty (APD)

Introduction

85. This section of the literature review considers Air Passenger Duty (APD). There has been a significant number of studies conducted on APD within the UK and many of these have been reviewed for this report. This section is set out as follows:

- History and background to APD;
- 2011 consultation and response;
- Air passenger taxes in other jurisdictions;
- The environmental argument;
- The impact of APD.

History and background to APD

86. APD was first introduced in 1994 as a per-passenger tax, with a £5 rate for flights within the UK/ EU and £10 for other destinations. Its original objective was to act as a 'green' tax but as acknowledged by the All Party Parliamentary Group for Aviation, APD is also an attractive tax for Government as a means to raise revenue and has the following benefits:

- It is easy to administer;
- It has very low collection costs;
- There is a very low avoidance rate;
- Around 40% is paid by overseas residents;
- APD rates are relatively stable and easy to predict; and
- There is low consumer awareness of the tax (typically airlines bundle the cost of the tax into a single 'Taxes and charges' figure making the tax opaque to the consumer).

87. Since its introduction and against this backdrop, APD has increased significantly and a number of other changes have been made. This included the introduction in 2001 of different rates depending on the class of seating (a Reduced Rate would apply for economy class and a Standard Rate for premium class).

88. Then in 2008, the Government held its first public consultation, which resulted in four distance bands being introduced. Consideration was also given to moving to a per-plane tax, however this proposal was not implemented as there was a significant risk that it would be found to be contrary to international agreements on aviation.

89. In its current form, APD is chargeable on each passenger taking off from a UK airport and whilst the amount payable applies to the journey as a whole, when an aircraft is making a stop 'en route' and passengers do not change aircraft, no additional duty becomes due for the leg of the journey immediately after the stop.

90. Table 6.1 below sets out the current rates of APD applicable.

Table 6.1: Air Passenger Duty rates (from 1 January 2013)

Bands	Reduced Rate (lowest class of travel)	Standard Rate (other than lowest class of travel)	Higher Rate (1)
Band A (0 – 2000 miles)	£13	£26	£52
Band B (2001 – 4000 miles)	£67	£134	£268
Band C (4001 – 6000 miles)	£83	£166	£332
Band D (over 6000 miles)	£94	£188	£376

Source: HM Treasury, 'Briefing note for new Air Passenger Duty operators'.
Note 1: the higher rate applies to all chargeable passengers on flights aboard aircraft of 20 tonnes and above with fewer than 19 seats

91. The total revenue raised from APD is forecast by HMT to rise significantly from £2.8 billion in 2012/13 to £3.8 billion in 2017/18[29]. An increase of 35% in 5 years, significantly above the rate of inflation.

[29] Office of Budgetary Responsibility (March 2013): 'Economic and Financial Outlook'

2011 Consultation and Response

92. In 2011 the Government launched a second consultation on APD[30] with the objective of having a simple tax system, to ensure a fair contribution towards the public finances and to reduce emissions across all parts of the economy. Table 6.2 below sets out the areas the Government sought views from relevant stakeholders and also the changes subsequently implemented.

Table 6.2: 2011 Consultation and Response

Kay areas consulted	Response
Review of the current band and class structure	The banding and class structure remain unchanged. It was argued that moving to a two band structure as proposed would result in those travelling within the UK and Europe having to pay more.
Consider the impact of APD at regional airports and local economies	A congestion surcharge was proposed by some regional airports to reflect local economic conditions. This was not supported by other airports or the airlines. The Government therefore committed the DfT to further consultation as part of its development of a sustainable framework for UK aviation
Consideration of the devolution of APD to Northern Ireland, Scotland and Wales	Given NI's unique circumstances within the UK (i.e. sharing a land border with the RoI which has a significantly lower rate of APD – €3), APD on direct long haul flights travelling from NI would be cut to the short-haul rate. From 1 January 2013, the rates for direct long haul flights in Bands B, C and D were devolved and set at £0. APD was not devolved to Scotland and Wales but this would continue to be explored (as part of the Silk Commission in Wales and the wider independence debate in Scotland).
Extending APD to business jets	APD has been extended to business jets.

Source: HM Treasury (March 2011): 'Reform of Air Passenger Duty: A consultation', HM Treasury (December 2011): *'Reform of Air Passenger Duty: Response to consultation'*

93. In addition to the general points made above, the following issues were raised during the consultation specific to Northern Ireland:

- All regions in the UK would be negatively impacted in terms of passenger numbers if the changes proposed in the Consultation (i.e. the reduction from the current four bands to either three or two bands) were implemented. It was estimated that

[30] HM Treasury (March 2011): *'Reform of Air Passenger Duty: A consultation'*

Northern Ireland would lose 104,000 passenger trips[31] (1.4% of total passenger traffic);

- An increase in Band A rates (0- 2000 miles) in order to achieve revenue neutrality would significantly impact Northern Ireland because in 2010 passengers travelling to and from Band A destinations accounted for 98.5%[32] of total passengers;

- Air connectivity is critical to the NI economy for a number of reasons including the attraction of FDI. Many Invest NI clients, including the New York Stock Exchange (NYSE), expressly stated that their presence in NI was only possible on the basis that direct air access to the US Eastern Seaboard capital markets was readily available. Furthermore United Airlines indicated that they were meeting the cost of APD from their revenue in order to compete with Dublin and they made it clear that the continuation of the Band B rate would result in the withdrawal of the service[33];

- The Chartered Institute of Taxation[34], in their response to the consultation indicated that "*the powers of a devolved government to impose a tax is … potentially circumscribed by the need to comply with EU law and this may mean that any gains that a government wanted to achieve (e.g. by reducing tax to encourage tourism) may be limited.*" As a consequence, the Government should consult with the EC on this issue if it decides to bring forward legislation to devolve these powers.

[31] Source: Frontier Economics (May 2011): '*The impacts of proposed changes in Air Passenger Duty',* Analysis for easyJet
[32] Source: DFP (June 2011): '*DFP Response to HMT Reform of Air passenger Duty Consultation'*
[33] Ibid
[34] Chartered Institute of Taxation (June 2011): '*Reform of Air Passenger Duty; a consultation by HM Treasury Response by the Chartered Institute of Taxation'*

Air passenger taxes in other jurisdictions

94. Even though APD is applied by six of the 27 EU member states, the rates applied in the other APD charging countries are significant lower than in the UK. Table 6.3 below shows UK APD rates compared to other EU countries.

Table 6.3: APD Rates charged in the EU

	Short-haul rate economy (€)	Medium-haul rate economy (€)	Long-haul rate economy (€)	Max rate any class (€)
UK	**16.0**	**89.9**	**113.3**	**226.6**
Austria	8.0	20.0	35.0	35.0
France	5.2	5.2	11.6	47.6
Germany	7.5	23.4	42.2	42.2
Ireland	3.0	3.0	3.0	3.0
Italy	4.5	4.5	4.5	5.5
Average (exc UK)	**5.6**	**11.2**	**19.3**	**26.7**
Ratio UK:EU	**2.8**	**8.0**	**5.9**	**8.5**

Source: evidence provided to the House of Commons All Party Parliamentary Group for Aviation's Inquiry into Aviation Policy and Air Passenger Duty by the Airport Operators Association (Aug 2012)

95. The difference in the UK rates of APD therefore ranges from 2.8x the EU average for short-haul economy to 8.5x the average for long-haul in premium economy and above. These figures reflect the results of a survey completed by the World Economic Forum[35] which places the UK 139th out of 140 countries in terms of 'ticket prices and airport charges'.

96. There have also been instances in other countries where APD had been introduced and then subsequently withdrawn. One example repeated throughout the literature relates to the experience in the Netherlands when they tried to introduce an equivalent to APD. There are clearly parallels with NI in respect of passenger leakage to RoI and the associated loss in economic activity.

[35] World Economic Forum (2013): '*The Travel and Tourism Competitiveness Report 2013*'

The Dutch Experience

1. On 1 July 2008, as a measure designed to 'green' the tax system, the Government of the Netherlands implemented an air passenger tax for passengers departing from Dutch airports. The tax had two rates: for destinations in EU member countries and other destinations located within 2,500 kilometres of the Netherlands, the tax rate was €11.25; for all other destinations the tax rate was €45.00. This tax did not apply to transfer passengers or to freight shipments. Initial Ministry of Finance estimates had predicted some €350 million annually in tax revenues to be generated. A later Government study estimated that the tax had cost the Dutch economy some €1.3 billion in lost revenue.

2. Prior to implementation, it was estimated that the new tax would result in the number of passengers using Amsterdam Airport Schiphol dropping by 8% to 10%. Following the introduction of the air passenger tax the number of passengers using Schiphol decreased and the volumes rapidly intensified as a result of the global economic crisis. The air passenger tax had proved controversial from its introduction, and these two events prompted the aviation and tourism sectors to intensify their protests against the tax. The Dutch Government responded by initially setting the air passenger tax at zero (€0.00) as of 1 July 2009 and subsequently abolishing the tax on 1 January 2010.

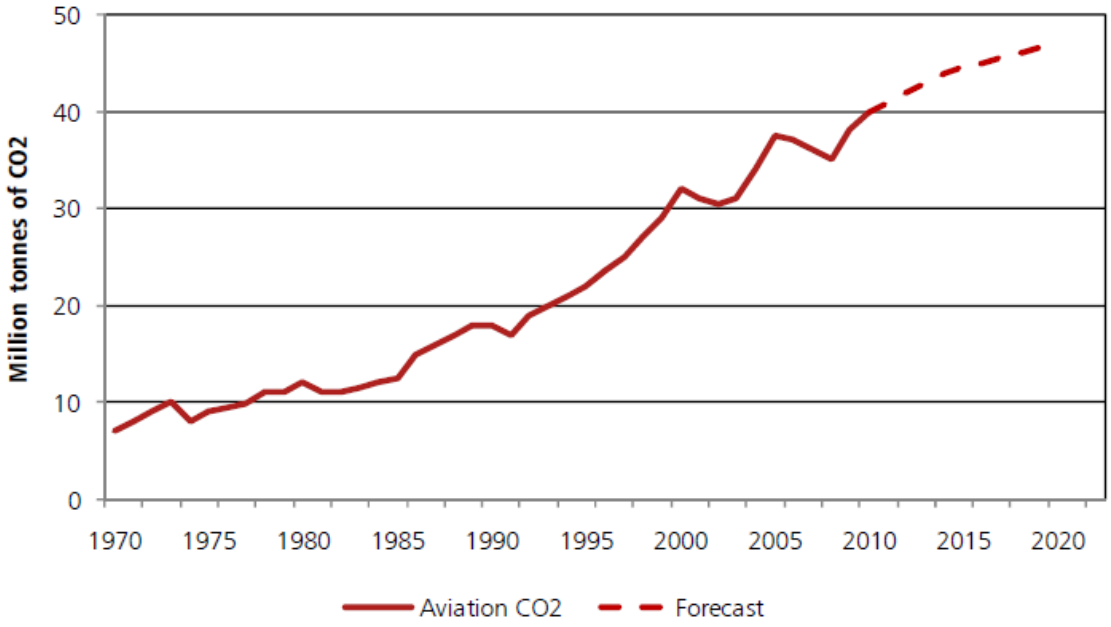
3. Implementation of the tax in July 2008 occurred shortly before the global economic crisis led to a decline in air travel worldwide. Passenger numbers at Schiphol, however, fell further than in other countries. Reports from airports across the border in Germany and in Belgium showed that the number of Dutch residents taking flights from those two countries had risen dramatically.

Reproduced from: House of Commons Northern Ireland Affairs Committee – Air Passenger Duty: implications for Northern Ireland.

The environmental argument and the need for a tax

97. Emissions from aviation have grown significantly over the last 40 years as shown in Chart 6.1 below. In 2011, aviation accounted for approximately 6%[36] of total UK Greenhouse gas emissions but looking forward, this is forecast to rise to as much as 15%[37] by 2030.

Chart 6.1: CO2 Emissions from aviation



Source: DfT Emissions forecasts, reproduced in the HMT 'Reform of APD: a consultation' (March 2011)

98. As a consequence there has been a strong argument that APD should be used as a 'green' tax in order to curtail this growth. Furthermore, the aviation industry does not pay VAT on airline tickets and there is no duty paid on aviation fuel. However, the House of Commons All Party Parliamentary Group for Aviation took evidence which supported the following findings:

- There is a general acceptance that the aviation industry should pay for the environmental cost caused by the industry, but ABTA presented evidence which indicated that the environmental cost of short-haul flights was between £2.18 and

[36] HM Treasury (March 2011): '*Reform of Air Passenger Duty: a consultation*'
[37] HM Treasury (2006): '*Pre-Budget Report*'

£3.30 and the cost for long-haul flights was between £18.05 and £20.24. Therefore APD rates currently significantly exceed the environmental cost;

- The aviation industry's participation in the EU Emissions Trading Scheme (ETS) ensures the environmental costs associated with air travel would be met through the ETS. To that end the German Government has stated that it intends to offset the revenue received from the sale of ETS licences to airlines against the revenue it raises from its APD equivalent. The All-Party Group took evidence from S&P which estimated that in the first year of ETS trading for airlines (2012), the industry will incur costs of €1.125 billion;

- VAT is not charged on any fares, regardless of mode of transport and therefore the aviation industry has no competitive advantage over other means of public transport

- Aviation fuel duty is not permissible due to international agreements under the International Civil Aviation Organisation (ICAO). Furthermore the ferry industry also does not pay fuel duty, nor does it have an APD equivalent. Also whilst bus operators no longer receive a fuel duty rebate, they receive a Bus Service Operator Grant. The airline industry does not receive a public subsidy;

99. In addition, a 2009 report by Oxera[38] found that "*before APD … the aviation sector pays about 32.5% of the wealth it generates (as GVA) in tax. This is very similar to the figure for the UK economy as a whole (32.1%). When the revenue raised by APD is included, aviation's tax contribution … rises to 54.5%*." In the same report, Oxera also estimated that in 2007 aviation's tax and regulatory burden is up to £0.6 billion more than its environmental cost.

100. In conclusion, there is significant evidence to support the notion that the airline industry is already meeting its environmental costs from other taxes. Furthermore, APD is no longer recognised as an environmental tax, and this is reflected in the Government's 2011 Autumn Statement which regards APD as "*purely revenue raising*".

[38] Oxera (November 2009): '*What is the contribution of aviation to the UK economy?*' Prepared for the Airport Operators Association.

The impact of APD

National impact

101. At a national level, one of the most recent studies undertaken to assess the economic impact of APD was completed by PwC[39]. This study concluded that the following economic benefits would be accrued if APD were abolished in the 2013 Budget:

- UK GDP would enjoy an permanent boost of 0.45% in the first 12 months and whilst this growth rate would reduce over time, it is estimated that economic output would be approximately 1.5% higher and 60,000 more jobs created by 2020 than would otherwise be the case without the abolition of APD;
- There would be an increase in industry investment in the aviation sector (fast tracking aircraft upgrades, infrastructure improvements, airline marketing spend);
- Increased demand for flights as a result of lower prices;
- Firms developer stronger international business relationships and increase productivity to meet increased demand;
- Net foreign inbound tourism passengers would be 7% higher by 2020.

102. One of the key findings of the PwC analysis was that receipts from other taxes would be expected to offset the Exchequer cost from abolishing APD and the move could be considered self-financing.

103. The World Travel & Tourism Council[40] estimate that the abolition of APD would result in an increase in GVA of between £1.8bn and £2.9bn across the aviation and tourism sectors creating between 37,900 and 61,300 new jobs. In addition, a further GVA impact of £1.3bn would be created as a result of consumer spending from the additional income available to inbound and outbound passengers.

104. However, as highlighted in the literature, at the national level there are a number of issues raised that suggest a reduction or abolition of APD may result in some negative consequences. These include:

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[39] PwC (February 2013): *'The Impact of Air Passenger Duty'*

[40] World Travel & Tourism Council (March 2012): '*The Economic Case for Abolishing APD in the UK*'

- the current fiscal environment makes it difficult for Government to lower taxes, particularly for items which could be interpreted as luxury goods. In addition, it is not clear how such a move would be perceived in the sovereign debt markets and with the ratings agencies;
- a reduction in APD would most likely result in an increase in the outflow of tourists thereby increasing the tourism deficit; and
- the increase in air traffic brings an associated environmental cost in terms of additional CO2 emissions.

Regional impact

105. In order to understand the potential implications of the devolution of APD to Scotland and Wales, the HMRC commissioned the Department for Transport (DfT) to model the impact of localised price changes on aviation demand and the redistribution of passengers between airports[41]. This modelling analysis was not completed for Northern Ireland.

Impact of price changes at Scottish airports

106. Firstly it is important to note that the 10 airports in the Highlands and Islands of Scotland have been exempt from APD since 1 April 2001 on the basis of "*the area's reliance on air transport for lifeline … to promote social inclusion and … benefit business and tourism.*[42]"

107. Therefore for the remaining (larger) Scottish airports, the DfT model forecasted that a price reduction equivalent to the full value of APD would impact passenger flows in three phases:

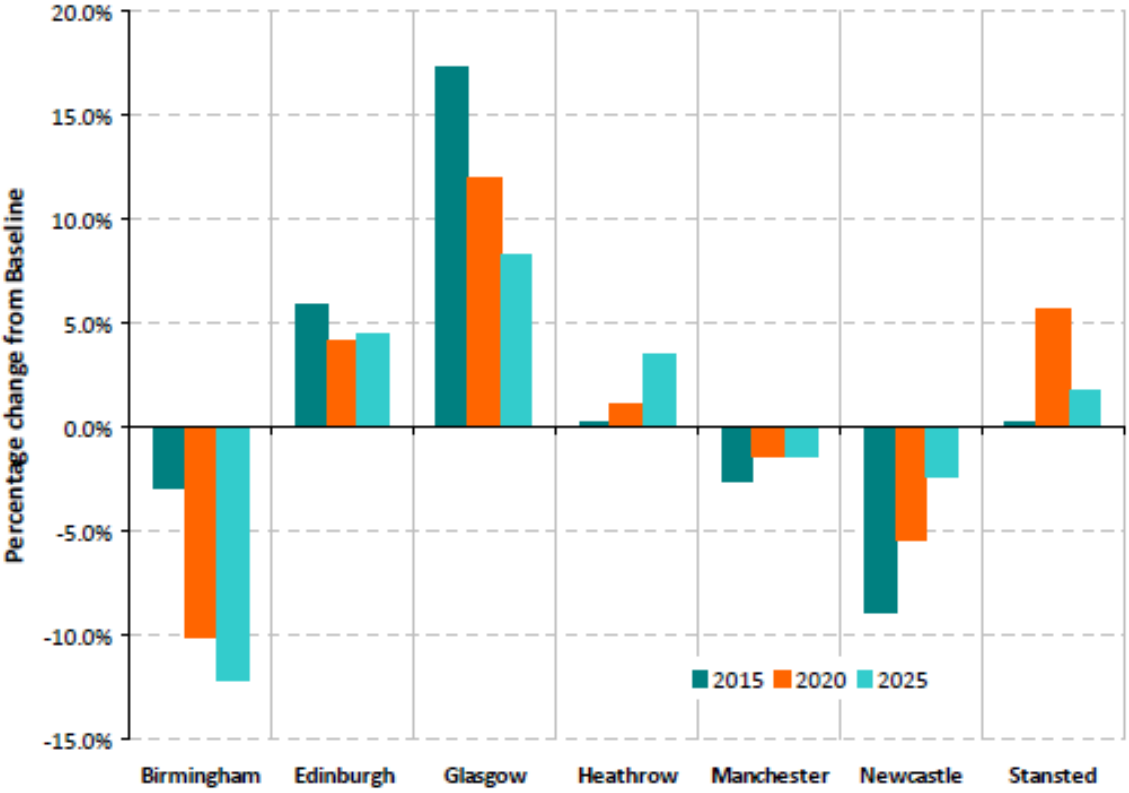
- Phase 1 – lower prices in Scotland attract passengers away from Newcastle predominantly but also Manchester;
- Phase 2 – more passengers from Scotland interline (transfer) through Heathrow and Stansted, thereby increasing passenger traffic at these airports;

[41] HMRC (October 2012): '*Modelling the Effects of Price Differentials at UK Airports*'. HMRC Research Report 188
[42] Scottish Transport Minister, Sarah Boyack 27 March 2001, News Release: SE0820/2001

- Phase 3 – increased numbers of passengers at Heathrow and Stansted increase their attractiveness, therefore attracting passengers away from Birmingham and Luton.

108. Chart 6.2 below sets out the percentage change in APD payable passengers in response to an APD reduction at Scottish airports.

Chart 6.2: Percentage change in passengers following an APD reduction at Scottish airports



Reproduced from: HMRC (October 2012): 'Modelling the Effects of Price Differentials at UK Airports'

109. The following conclusions are made from this analysis:

- The big winners in both the short and long term are Edinburgh and Glasgow, with Heathrow and Stansted also increasing passenger numbers;
- The big loser in the short term would be Newcastle, but in the longer term Birmingham would set to lose out the most.

110. In addition to this HMRC analysis, Aberdeen, Edinburgh and Glasgow airports commissioned York Aviation to assess the impact of APD on the Scottish air transport market[43]. This analysis concluded that the impact of the increase in APD in 2007 resulted in the loss of 1.2 million passengers that year (against the baseline of 2006 APD rates). Following another significant increase in APD rates in late 2010, the number of passengers lost in 2011 (against the 2006 baseline APD rates) was estimated at 1.7 million and this is expected to increase further to an annual loss of 2.1 million passengers by 2016. In financial terms, it is estimated that in bound tourism expenditure will be £210 million less in 2016 and tax revenues approximately £50 million lower.

Impact of price changes at Welsh airports

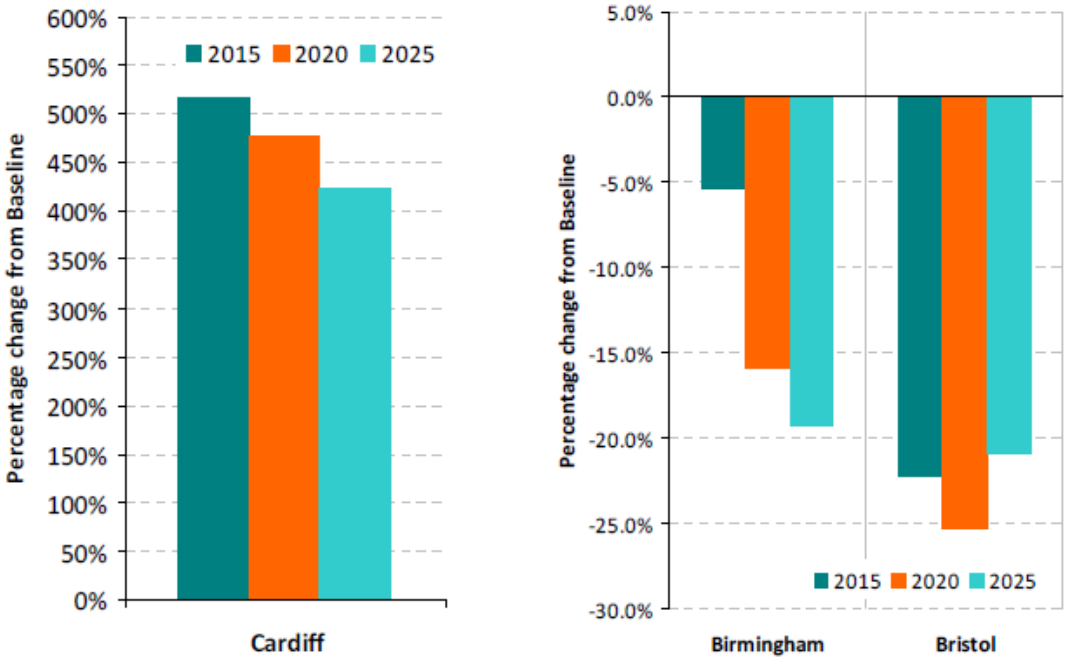
111. Cardiff is the only Welsh airport in the DfT model and it is forecast that a price reduction equivalent to the full value of APD would impact passenger flows in two phases:

- Phase 1 – cheaper flights at Cardiff would attract traffic away from Bristol and to a lesser extent Birmingham; and
- Phase 2 – as demand increases at Cardiff, the long-haul market would develop thus attracting more passengers away from Birmingham.

112. Chart 6.3 below sets out the percentage change in APD payable passengers in response to an APD reduction at Cardiff airport.

[43] York Aviation (October 2012): '*The Impact of Air Passenger Duty on Scotland*'. For a consortium of Scottish Airports.

Chart 6.2: Percentage change in passengers following an APD reduction at Cardiff airport



Reproduced from: HMRC (October 2012): 'Modelling the Effects of Price Differentials at UK Airports'

113. The following conclusions are made from this analysis:

- Due to the relatively small numbers of passengers currently travelling through Cardiff (approx. 0.5 million p.a.) the percentage increase in traffic flows is very significant;
- The major impact in Birmingham is only experienced in the longer term as international destinations are developed from Cardiff; and
- The impact on other UK airports (Gatwick, Heathrow, Luton and Manchester) is minimal.

114. Unfortunately the HMRC report did not include an assessment of the impact of a reduction in APD at the Northern Ireland airports. DETI may consider commissioning this analysis from the DfT. **However, the analysis shows very clearly the impact on passenger traffic in one jurisdiction when a neighbouring airport is not subject to APD (or where one is applied at a much lower rate). This is clearly a current issue in Northern Ireland.**

Appendix A – References

The following references were used in the completion of this Literature Review and have also been footnoted where appropriate throughout the report.

ABTA (2012): '*Driving Growth – The Economic Value of Outbound Travel'*

Airports Commission (2013): '*Discussion Paper 02: Air Connectivity and the Economy*'

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