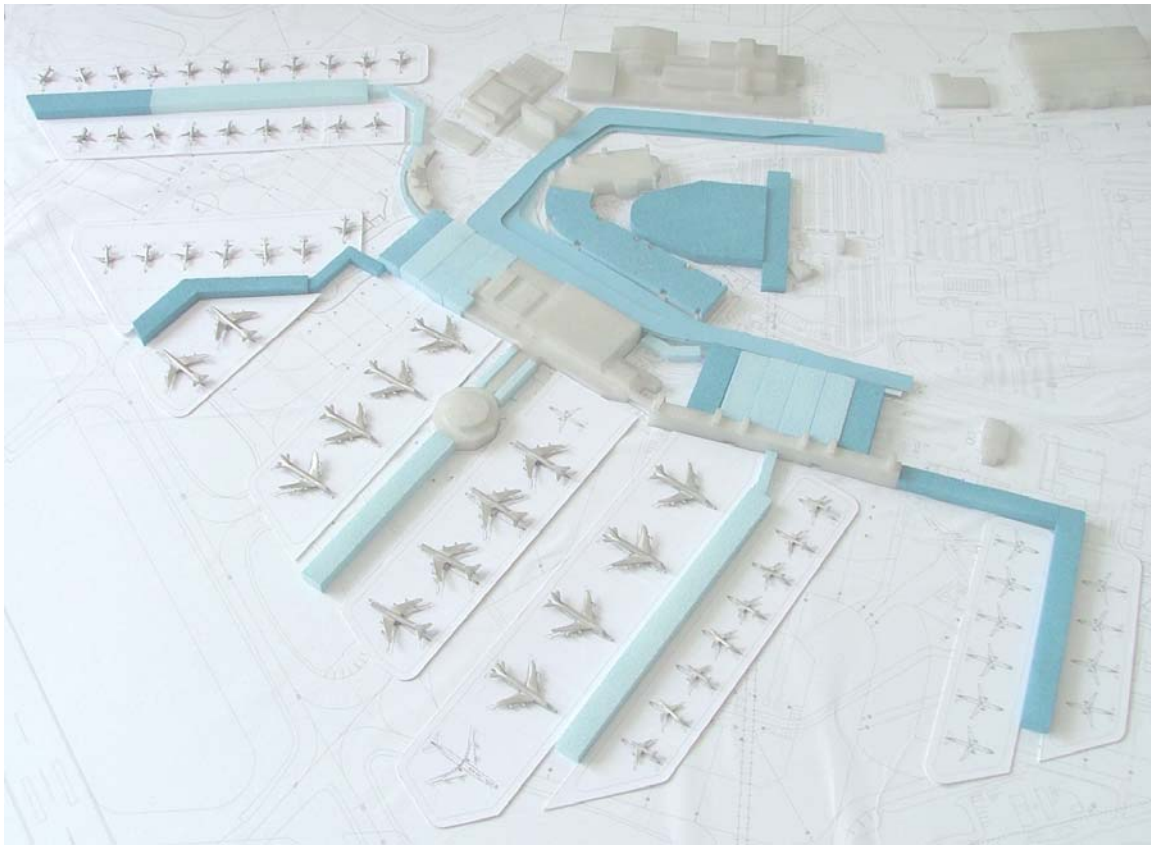
Dublin Airport Passenger & Aircraft Movement Demand Forecast Report



Final Version

Issued April 2006 (Text updated in August 2006)

Ref DAPF06/01

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1 Current Forecast

1.1 Introduction:

Passenger demand and aircraft movement forecasts are produced for Dublin Airport each year. These forecasts are used during capacity development, business planning and regulatory reviews. They assist the DAA in considering what investment in infrastructure is required to meet future demand and how this can be phased and funded. High and low demand forecasts are also produced to test the airport's ability to cope with higher than expected growth and to test the financial constraints implicit where growth is lower. These projections, based on the best knowledge available, allow for a consistent and reasonable series of data to be used across the organisation. This is more important than ever this year as Dublin faces major capacity developments over the next 10 years

This is a time of rapid change for the air travel industry. Many airlines are adapting their business models; new technologies such as the Internet are providing efficiencies for passengers and airlines alike; globalization is increasing and world trade is thriving, while manufacturers are launching new aircraft that will fly further at lower cost. After a downward cycle in aviation during the early half of the decade, 2004 and 2005 have seen a major recovery with growth of 15.3% and 7.6% respectively[1]. Despite this growth, the airline industry lost US$6 billion in 2005 and it is likely further losses will follow in 2006. It is important to note that these losses are due primarily to the poor performance of many US airlines, with many major European operators operating profitably.

The major concern for airlines remains the price of jet fuel, which has reached record highs over the last 12 months. It is now commonly accepted that fuel prices will not fall back to previous level. However because of the ability of carriers to cut costs and improve efficiency and because of the willingness of passengers to pay more, growth has being maintained. IATA expects global traffic to grow in the 5% to 6% range during 2006.

It is now acknowledged that capacity development is urgently needed at Dublin airport. For the first time, the Commission for Aviation Regulation (CAR) declared it to be fully co-ordinated from the start of the summer 2006 season[2]. Hence, unlike previous forecasts, this forecast is starting from a position with significant constraints. A demand forecast is still produced in which an analysis is done of the number of passengers who will use the airport given certain economic and fare conditions. Applied on top of these conditions are airline and route assumptions. These conditions factor in the wider capacity constraints in the airport and are a major factor in the initial 5 years of the forecast. Longer-term capacity inhibitors are not assumed.

This document details the forecast methodology, assumptions and relevant factors used by the Dublin Airport Authority in 2005/2006 in order to produce passenger and aircraft movement forecasts. The results of the centreline forecast are offered here, although a range of other scenarios are also being produced reflecting planned airline activity, some of which has being announced subsequent to the finalisation of this data.

[1] IATA

[2] This has subsequently been squashed by the High Court: Ryanair v Commission for Aviation Regulation July 2006.

1.2 Choice of Forecasting Methodology:

The first step in the production of a forecast is the choice of forecasting methodology. While there are many acceptable techniques and procedures for forecasting aviation activity at a specific airport, most forecasts utilize basic techniques such as regression or share analysis.

Since models are relatively simple descriptions of very complex systems, they cannot account for all the political, social, psychological and economic factors and their interactions, which will lead to a particular set of outcomes. Therefore the underlying models are generally moderated based on the judgement of the forecasting team in an attempt to mirror more precisely the complexities of the operating environment. This can be accomplished by adjusting exogenous variables, adjusting the model outputs or revising the models initial parameter estimates. No two forecast methodologies approach the problem in the same way. Exceptional events like SARS or 9/11 can never be forecast. Instead, while the industry does experience highs and lows, the long-term forecast assumes that these cycles will smooth out over the period of the forecast.

It is important to note that there is no "correct" methodology, only a reasonable one. Aviation is a complex and dynamic industry, where a wide range of factors can influence future projections. The balance of these factors will vary between different aviation markets.

1.3 DAA's Forecasting Process and Methodology:

The Dublin Airport Authority's forecasting methodology is similar to that used in many other airports. It has also been extensively reviewed and endorsed by external consultants in recent years. In 1999 it was analysed by SH&E, as part of the Warburg Dillon Read review of the Aer Rianta Strategy for the Minister for Public Enterprise. In 2005 Mott MacDonald was hired by CAR to evaluate it and concluded that the process was "considered to be appropriate for the purposes for which it is intended and represent the application of 'best practice"[3]. Indeed, CAR has accepted the Dublin Airport official forecasts in its each of its determination processes to date.

1.3.1 Forecasting Process:

- Historical Update: The first step involves the input of the historical data into the model on a route-by-route basis.
- Model Parameter update: The model parameters are then re-evaluated and updated.
- Internal Consultation: It is important to obtain the views of the various departments in Dublin Airport in order to fully understand the current issues that are relevant. An internal Forecasting group, made up Group Strategy, Traffic Development, Retail, Operations Planning, Finance and Capital Programmes, is convened to agree on the set of assumptions to be used. Once the preliminary set of assumptions are agreed and the model updated, draft figures are produced. The Forecasting group then undertakes an intensive review process of the draft data. Any adjustments or break in trends regarding fleet changes, competition plus new routes and services being opened/dropped are fed into the model. This leads to new draft figures being produced and assessed. This continues until a stable set of assumptions is reached for the short-term. Once the initial years are agreed on, long-term forecast figures are produced, which are driven almost exclusively by the exogenous

[3] Mott MacDonald: Preparation and Evaluation of Dublin Airport Traffic Forecast May 2005

variables (e.g. GDP). An iterative review is again undertaken until the final set of figures is formally accepted.

- External Consultation: A key element in producing a forecast is insuring that the process involves discussions with Dublin Airport's major airline customers. Airline projections are not necessarily accepted at face value, as the actions of one airline affects the competitive landscape. Thus, gains by one airline may negatively impact on another's growth plans. Instead the forecast tries to model the overall trends suggested by the airlines.
  For the current forecast, major airline users were informed that Dublin airport was producing a forecast and that it would welcome meetings with them to review the forecast methodology and listen to their future plans. The AOC was also informed that any user input was welcome. Meetings with Aer Lingus, Ryanair, CityJet, Aer Arann, American Airlines and Gulf Air took place. Thus, Dublin Airport had detailed discussions about the development plans and main aims of 4 of the top 5 scheduled airlines in Dublin. Furthermore, with the long-haul market set for a period of change with probable US Open Skies and the opening of the Middle Eastern region, American and Gulf Air offered an important perspective on the development of new long haul markets. Issues relevant to other carriers were flagged in the internal review process. In addition to the normal consultation process, this year there was a range of other meetings with users (bilateral and multilateral) in the context of the airport development plans. These also provided a range of useful data. Thus it is felt that a comprehensive picture of the current views about growth potential of airlines in Dublin was captured.

1.3.2 Aer Rianta Forecasting Model:

The main drivers of the Dublin Airport Authority forecasting model are economic growth (in terms of real GDP) and airfare trends. Other short-term adjustments can be made based on customer input or local market judgement.

The most important drivers of air traffic growth are listed below.

Table 1.1: Key Drivers of Traffic Growth

Primary Driver	Secondary Driver
Economic Growth	Exchange Rates
Yield	Fuel prices
	Population and Demographic changes
	Tourism
	Modal Competition
	Market Fragmentation
	Airline Route Mix
	Airline Fleet
	Airport Capacity
	Airline Strategies

Some of these factors are not explicitly applied in the forecasting model but they have been used when formulating the adjustments and trends fed into the model. These drivers may have a bigger impact on some route groups than on others. It should also be noted that because routes are based on traffic from the origin and the destination, some factors might have a positive effect on one side of the flow but a negative effect on the other.

1.3.3 Passenger Traffic Forecasting:

Detailed monthly historical information was loaded up to year-end 2005 by major route and route group, with 2006 figures based on traffic estimates agreed with the local marketing department.

For subsequent years, the model produces a forecast traffic growth rate for each route/route group in the model. This growth rate is calculated on the basis of passenger profiles by country of residence, weighted by projected exogenous parameters such as GDP per capita for each of these countries and taking into account airfare trends, airfare elasticities and GDP elasticities. From these passenger growth rates, the model produces the passenger demand for each year and route/route group.

1.3.4 Capacity, Aircraft Movements & Load Factor:

Load factor trends at route level are based on carrier input and internal review. Load factors have climbed in recent years and although it is projected that they shall decline in 2006 because of the large increase in capacity, it is expected that the positive trend will return in 2007 and continue into the future, especially since one of the key elements in both the low cost-model and in the recovery of many network carriers, is high load factors. Similarly with the aircraft profile, the trend is towards increasing airline fleet commonality, with the average size of the aircraft increasing. Furthermore, older aircraft are been replaced with more fuel-efficient and less noisy aircraft at a faster rate than previously. In fact, the aircraft based at Dublin airport are now quite modern after the recent short haul fleet replacement programmes by Ryanair and Aer Lingus. Hence unlike previous forecasts, the degree of further transition is likely to be lower and involve smaller carriers in Dublin with old fleets.

Based on these load factors and the aircraft profile, capacity and aircraft movements are derived from passenger demand projections. Additional adjustments on routes may be made to take into account the situation at constrained airports.

1.3.5 Input Data:

The following table outlines the source data used in this forecast, and the origin of the data used. This basic data can then be modified by trends and adjustments. The values used are tabulated in Appendix 1.

Table 1.2: Input Data Sources

Input Category	Source
Historical Passenger Traffic	Dublin Airport Authority databases
Historical Movements & Load Factors	Dublin Airport Authority databases
GDP values	Ireland: ESRI Medium Term Review 2005-2012 Dec 2005; Other countries: National Institute Economic Review Oct 2005
GDP elasticities	Best practice from international forecasters & review
Airfare elasticities	Best practice from international forecasters, literature review & consultation
Market Share Data	IMS Passenger Tracking Survey 2004-2005
Aircraft Mix by route	Airline fleet plans where available
Airfare trends	Various – see below
Traffic Adjustments	Various – see below

1.3.6 Economic Data: (Table A1)

After a decade of generally high growth and low unemployment there is a continuing confidence that the Irish economy will prosper for the short to medium term. The short slowdown of 2001-03 did not lead to an appreciable rise in unemployment and as a consequence it did not significantly dent confidence in the future. The world economy accelerated at its fastest pace in almost 30 years in 2004 (circa 5.1%) and although it slowed in 2005 (to circa 4.6%), the short-term outlook remains buoyant with rapid growth expected over the next 2 years. In the longer term the risk must be more weighted to the downside considering the current global account imbalances and the current oil price shocks.

The fundamental factors driving the Irish economy remain favourable, with a very fortunate set of demographic circumstances over the next 15 years, past investment in education continuing to boost productivity, the labour market showing considerable flexibility and the very elastic labour supply through migration from Eastern Europe meaning that the labour market is fast to react to changes in demand. A key risk is the extremely high level of dependence on the continuing success of the building industry.

The ESRI notes that the international environment is more uncertain than it was at the time of its last Medium Term Review and in particular that the imbalances present in the US economy must unwind at some point in the future. There is considerable uncertainty about the timing and speed of such an adjustment and the ESRI has produced 2 forecasts to cater for the situation. One situation envisages that the US economy does not adjust and continues to experience robust growth (but unsustainable in the long term), while the second assumes that the US current account deficit declines gradually to a long-run sustainable level. The ESRI feels that the higher growth scenario was more likely for the next few years and we have thus used its high forecast for the period up to 2010 and then used its low forecast for the following years as the basis of Dublin Airport centreline growth forecast.

1.3.7 GDP Elasticities: (Table A2)

The GDP elasticity term describes the percentage change in passenger traffic with respect to a 1% change in GDP. In a mature market, traffic reacts more slowly to economic growth than in a developing one. Thus GDP elasticities are expected to decline over time. Table A2 summarises the GDP elasticity values by market used in the model.

The historic rule of thumb suggests that traffic grows at a rate twice that of inflation adjusted GDP. But an average taken over the past 30 years suggests that in fact, the rate of the growth is much closer to 1.5 times and that it only hits the twice GDP rate for relatively short periods when the industry is at or close to the peak of a cycle[4]. This is a global average and would include a lot of immature markets with high elasticity values. It could be expected that in Dublin the elasticity would be lower than average as the market is more mature.

That analysis led to an internal review of the elasticity values that should be used in the various markets from Dublin, by comparing the historic passenger growth out of the airport (and out of Ireland) with GDP growth. Based on this analysis, London's elasticity has being decreased compared to previous forecasts. The UKP elasticity has also been negatively adjusted but the Europe and Long Haul elasticities are still reasonably robust.

[4] Airline Business January 2006

1.3.8 Base Airfare trend: (Table A3)

Where there is substantial capacity growth on a route, airfares are likely to drop in the short term to stimulate traffic to fill this additional capacity. Thus, where we believe there will be such sizeable growth, we have inserted a stimulating price trend. Due to the substantial increase in passengers in 2006, further significant stimulation due to airfare decreases is not assumed beyond 2006, as airlines bid to safeguard yields. This is especially relevant considering the hike in oil prices. Airlines do not have the ability to cut fares as they may have done previously. Table A3 summarises the main airfare trend assumptions made in the model.

1.3.9 Airfare Elasticities: (Table A4)

The price elasticity of demand describes the percentage change in demand in response to a percentage change in price, and it is normally negative. If the absolute value is greater than 1, demand is said to be 'price-elastic', if less than 1, it is said to be inelastic.

Airfare elasticity diminishes when absolute fares decline, since the same percentage change reduces in significance to the consumer. Furthermore, long-term elasticities will be more inelastic than those over a shorter horizon, since consumers will be expected to compensate for a price change over the longer term.

Normally, price elasticity values are considered independently of quality elasticities, which might affect the modal dynamics.

1.3.10 Traffic Adjustments:

Airfare trends and GDP growth may not explain trends expected, with a huge degree of confidence, in the short term. Thus, on top of the growth driven by GDP and airfare trends, specific route adjustments are made to increase or decrease traffic in the opening years of the forecast. The main focus was on adjustments to reflect Open Skies on the transatlantic market. These were:

- Traffic adjustments based on adding extra frequency to existing routes.
- Traffic adjustments based on aircraft bypassing Shannon.
- Traffic adjustments based on seasonal routes flying direct all year round.
- Traffic adjustments based on new routes equivalent to 2 daily routes.

Furthermore adjustments were made:

- Traffic adjustments were made in 2007, to reflect the rollover of routes added in 2006.
- Traffic adjustments were made based on a small number of new daily routes to Europe.
- Traffic adjustments were made to reflect the failure of some short-haul routes due to competitive pressures from other airlines and routes.

1.3.11 Factors influencing the Forecast base trends:

1.3.11.1 Exchange rates & Oil prices:

Over the last 2 years oil prices have spiralled and while it is no longer expected that prices will reduce to 2002 levels, there is still a range of views on what level prices will ultimately stabilise,

as it involves a wide range of political and economical factors[5]. Unlike the 1970s, the global economy has not been severely affected by this hike in prices. This is because, since 1990, there has been a decoupling of energy demand from economic growth, due to growth in recent years taking place in less energy-intensive sectors, while more energy-efficient equipment and practices are being developed. The latter is especially true in aviation and is encouraging the rapid change over to newer and more fuel-efficient aircraft. Each generation of aircraft is 20-25% more efficient than the previous one with a new generation every 15 years or so. Thus, while a further fuel spike on top of already high prices would have a significant detrimental effect on passenger growth, it is not assumed to occur in our centerline scenario.

Since 2002, the strength of the Euro against the dollar has hampered growth in the Euro area with the real effective exchange rate rising by over 15 per cent in the past 3 years. The ESRI is expecting that the Euro will continue to appreciate, because of the US current account deficit, although it is unclear whether it will be gradual or whether there is a sharp correction.

In light of the level of uncertainty in relation to this issue, Dublin Airport Authority does not forecast the likely trends in these variables, which implicitly assumes that they will stay reasonably constant in real terms. However, as GDP forecasts do factor in expected trends in exchange rates and oil prices, these factors are implicitly considered. Furthermore, high and low growth scenarios, characterised by higher and lower GDP, can represent circumstances where oil price changes in the future significantly impact economic growth.

1.3.11.2 Population and Demographic Changes:

According to the CSO's Population and Migration report[6], the population of Ireland reached 4.13 million by April 2005, which is the highest since 1861. This figure represents an increase of 2.2% over the previous year. 61% of this growth is due to net migration, with the remainder coming from a natural increase in population (i.e. births less deaths).

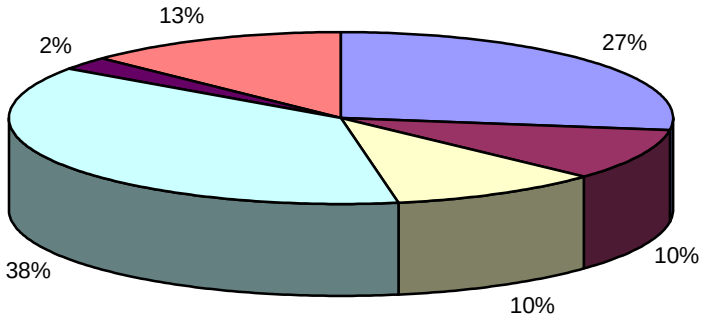
Immigration reached record highs for the year ended April 2005 due to the enlarging of the EU in May 2004 with 10 new EU states. The proportion of immigrants from these states has increased from 8% to 38% in one year. The major contributors are Poland and Lithuania, from where 17% and 9% (respectively) of immigrants originate. Press coverage suggests that this trend has continued over the last year.

While 15% of immigrants are of non-EU nationality, 24% of immigrants originated from non-EU countries, suggesting the continued return of Irish emigrants. As can be seen below, the returning Irish still makes up a high proportion of immigrants.

Based on these preliminary figures for 2005, for every person emigrating from Ireland to the UK in 2002, over 3 people moved from the UK to Ireland. In fact after a decline over the early part of the decade, this rate has increased over the last couple of years reflecting the continued success of the Irish economy, while the UK economy has suffered slightly. The impact of this return will affect the level of VFR traffic to/from this very important UK market.

[5] 2nd Aviation Forecasting Conference: Airfinance Journal and Euromoney, Vienna Feb 2006.
[6] CSO Population and Migration till April 2005: Released 14 September 2005

Figure 1.1: Immigration into Ireland 2004/2005



Emigration has declined for the last 6 years and is at its lowest level since this record began in 1987. Compared to 2000, emigration has declined by 38%. 45% of emigrants go to countries inside the EU, 10% go to the US, while the remaining 45% go elsewhere. The age profile of emigrants was younger than that for immigrants. Half of all emigrants were aged 15-24 years, while just over half (54 per cent) of all immigrants were aged 25-44 years, which reflects Ireland's policy of attracting more skilled immigrants.

The presence of significant numbers of immigrants from Eastern Europe based in Ireland has generated new passenger flows. In 2003 there were no scheduled routes to Poland from Ireland. By April 2006, there were 7. Additional routes have emerged to the other new EU states also. These routes are driven by the economic success of Ireland and will be affected by any downturn here. On the other hand, positive links created now to Eastern Europe should have longer-term benefits whatever the economic situation.

Furthermore, Bulgaria and Romania are likely to join the EU before the end of this decade and while the Irish government has indicated that it may not offer similar freedom of movement opportunities initially to these 2 countries, in the longer term these 2 countries offer further growth potential.

The ESRI predicted that Ireland would continue to need a large number of immigrants in the coming years to insulate the economy from a constraint in the labour supply. Depending on the economic situation this will vary from up to 50,000 immigrants a year down to 10,000. Declining birth rates necessitate this. Without immigration, the population would begin to diminish in future.

The extent to which traffic will be inhibited or stimulated will depend on the comparative propensity to travel by air of the new immigrants as opposed to the former Irish emigrants living in the UK/US. The initial routes to Eastern Europe have performed well but it will take several years before long-term trends can be extrapolated.

Table 1.3: Estimated Emigration by Destination Region 1997-2005 (000)

Year	UK	Rest of EU 15	EU 10	USA	Rest of World	Total
1997	12.9	4.1		4.1	7.9	29.9
1998	8.5	4.3		4.3	4.1	21.2
1999	11.2	5.5		5.3	9.5	31.5
2000	7.2	5.5		4.0	10.0	26.6
2001	7.8	5.6		3.4	9.5	26.2
2002	7.4	4.8		4.8	8.5	25.6
2003	6.3	4.3		2.5	7.6	20.7
2004	4.9	3.4		2.8	7.4	18.5
2005	4.1	2.9	0.5[7]	1.7	7.4	16.6

The effect of the reduction in emigration has been supplemented by the influx of immigrants, often highly skilled and adding to the economy.

Table 1.4: Estimated Immigration by Region of Origin 1997-2005 (000):

Year	UK	Rest of EU	EU 10	USA	Rest of World	Total
1997	20.0	8.1		6.6	9.3	44.0
1998	21.1	8.7		4.9	9.3	44.0
1999	22.3	10.2		5.9	10.5	48.9
2000	20.8	11.7		5.5	14.5	52.6
2001	20.6	10.3		6.7	21.5	59.0
2002	19.1	11.3		6.6	29.9	66.9
2003	13.5	9.7		4.7	22.5	50.5
2004	13.0	12.6		4.8	19.7	50.1
2005	13.8	8.9	26.2	4.3	16.8	70.0

1.3.11.3 Business Leisure Mix

The business/leisure mix profile has been updated based on the 2004/2005 Passenger Tracking Survey prepared by TNS/MRBI for Dublin. A summary of the overall results from these reports are presented below by route group (previous year figures are in brackets):

Table 1.5: Purpose of Travel profile at Dublin Airport in 2004/2005

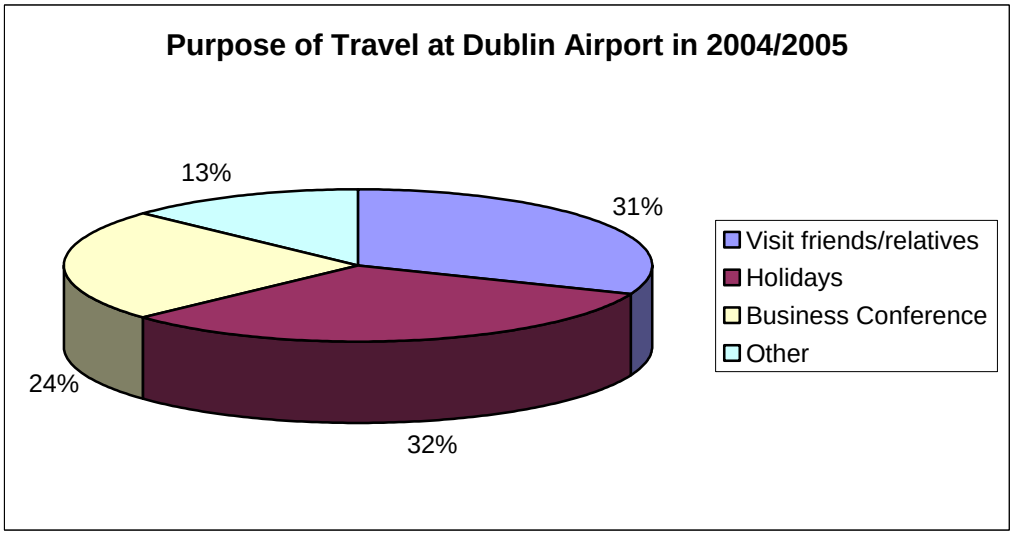
	Total	London	UKP	Europe	T/A	Domestic
VFR	31%(*28%*)	35%(*32%*)	35%(*32%*)	24%(*20%*)	28%(*26%*)	28%(*26%*)
Annual holiday	13%(*13%*)	11%(*12%*)	5%(*5%*)	17%(*18%*)	32%(*29%*)	6%(*9%*)
Additional holiday	19%(*21%*)	12%(*16%*)	23%(*23%*)	27%(*26%*)	10%(*21%*)	7%(*10%*)
Personal/Family	6%(*6%*)	6%(*7%*)	6%(*8%*)	4%(*4%*)	7%(*5%*)	7%(*8%*)
Funeral	1%(*1%*)	1%(*1%*)	1%(*1%*)	0%(*0%*)	1%(*0%*)	1%(*1%*)
Business/Conference	24%(*25%*)	29%(*28%*)	22%(*24%*)	21%(*23%*)	17%(*14%*)	45%(*40%*)
Study	2%(*2%*)	2%(*2%*)	2%(*2%*)	4%(*4%*)	2%(*2%*)	1%(*1%*)
Other	4%(*4%*)	5%(*3%*)	5%(*4%*)	3%(*4%*)	2%(*2%*)	4%(*5%*)

[7] EU 10: accession countries on 1 May 2004 i.e., Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia. For the years earlier, the data relating to the EU 10 are included with the Rest of the world.

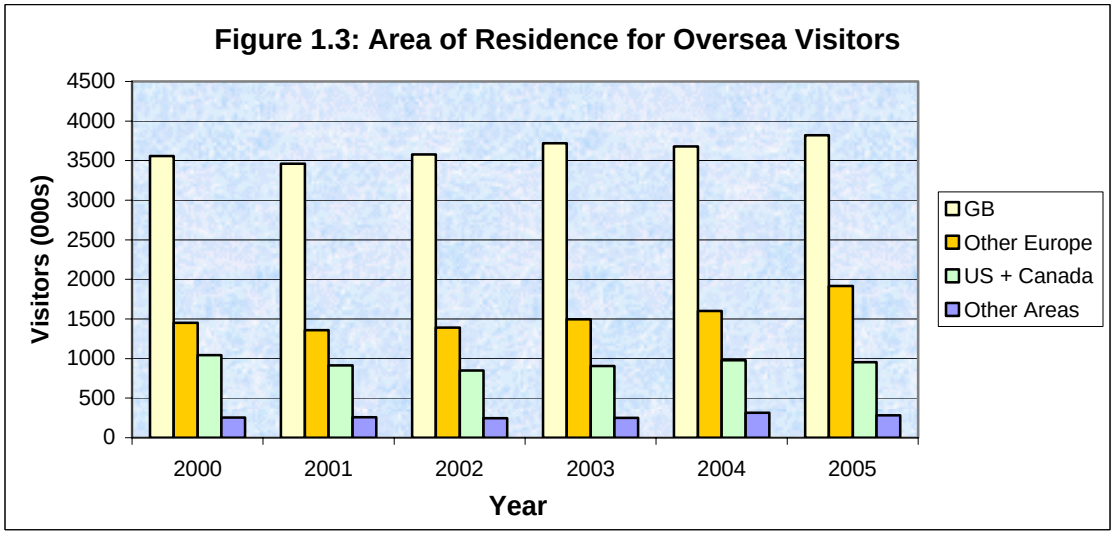
There has been some change in the overall trends, with the VFR segment remaining very important and growing in all markets compared to the previous year. The growth in the European VFR segment is because of the new Eastern European routes. Overall holiday and business proportions decline. The decline in the proportion of people travelling to/from London for holiday purposes is especially marked, as it drops from 28% to 23%. This suggests that the number of alternative direct routes is eroding this traditionally strong segment.

Rather surprisingly, the proportion of the sample on transatlantic routes travelling for holiday purposes also suffers, as it drops from 50% to 42%. This highlights the continued durability of the VFR and business market. Even though many Irish people may have returned to Ireland, the business and leisure links they built up in the US remain (at least in the medium term). It should also be noted that a strong long haul business market is a good indicator of a strong economy. On the domestic front, the business proportion continues to be very important. This reflects how, as the overall domestic market declined in 2005; it would concentrate on the more stable business market.

Figure 1.2:



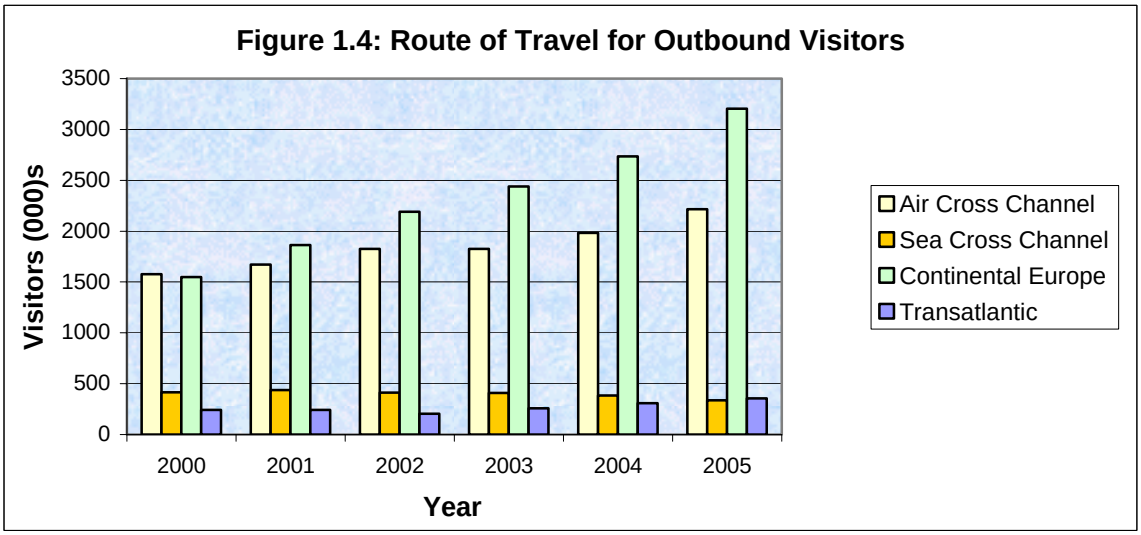
1.3.11.4 Tourism Trends:



An analysis of the most recent CSO tourism data[8] indicates that the numbers to Ireland increased by 6% in 2005. After a dip in 2001, traffic has reached record levels for each of the last 3 years. The number of overseas visits on cross-channel routes grew by 5%, while the number on continental routes grew by 21% compared to the previous year. While the number of visits on transatlantic routes increased by 6% in 2005, the number of actual visits by US plus Canadian residents fell by 2% compared to 2004. The latter figure shows that the very important outbound US tourism market is still suffering from security fears, the Iraq war etc.

The trend of tourist growth out of Ireland (13%) exceeding tourist growth into Ireland (6%) continued in 2005. In fact, over the last 6 years, the difference in numbers between tourism inbound and outbound has declined from 2.5 million to 0.9 million. If this trend continues, there may be more Irish residents travelling abroad than foreign residents travelling to Ireland before the end of the decade. Already there is a net outflow of €501m, when earnings from visitors to Ireland are compared to expenditure by Irish visitors abroad.

Figure 1.4: Route of Travel for Outbound Visitors



Of this 13% growth in outbound travellers, Irish residents travelling on continental routes increased by 17%, transatlantic numbers grew by 16%, while those on cross channel routes grew by 8%.

In terms of "purpose of travel", the major points to note was that business traffic to Ireland has rebounded over the last 2 years although it is still well below the levels experienced in 2000. This is a reflection of the recovery in the global economy in the last couple of years. The major contributor to growth into Ireland was VFR traffic, which grew by 18% in 2005. In comparison, holiday traffic to Ireland has barely changed in 2005 (after growing 2% in 2004). This is an indication of the continued difficulty Irish Tourism bodies are having in marketing Ireland abroad. Airfare trends are just one element in how price sensitivity affects the tourist industry, and despite the boom in low cost carriers flying to Ireland in 2005; this holiday segment has not been noticeably affected.

In comparison, all segments of overseas visits by Irish residents have grown strongly in 2005, with business traffic climbing by 10%, the holiday segment increasing by 14% and the VFR

[8] CSO Tourism and Travel Annual 2005, published 15th March 2006

segment going up by 9%. This reflects the healthy economy and the range of airline services available out of the country.

1.3.11.5 Modal Competition: Dynamics of the Ireland-UK Air-Sea Market:

Modal competition is an important aspect of the Ireland-UK and domestic markets. For well over a decade there has been a gradual shift in traffic from sea to air.[9] As can be seen below, the aviation share on the Ireland-UK market has grown from 65% to 78% from 1998 to 2005. During this time the number of passengers that travel by sea has declined by 27%. It is commonly accepted, even in the ferry industry, that it will be very difficult to arrest this decline. The increase in services from regional airports makes it even more difficult for ferries to compete with airlines. This is why the decline speeded up in 2005 (up to 8%) compared to an average decrease of 4% over the last 7 years.

Tourism Ireland is trying to encourage people in the UK to travel to Ireland by ferry because it is widely felt that people with cars disperse throughout the country better, which would help the more remote parts of Ireland that have not benefited from the increase in visitors to Ireland. It is unclear whether this initiative can do any more than slow down the rate of decline.

Figure 1.5: Ireland and UK Air & Sea Trends

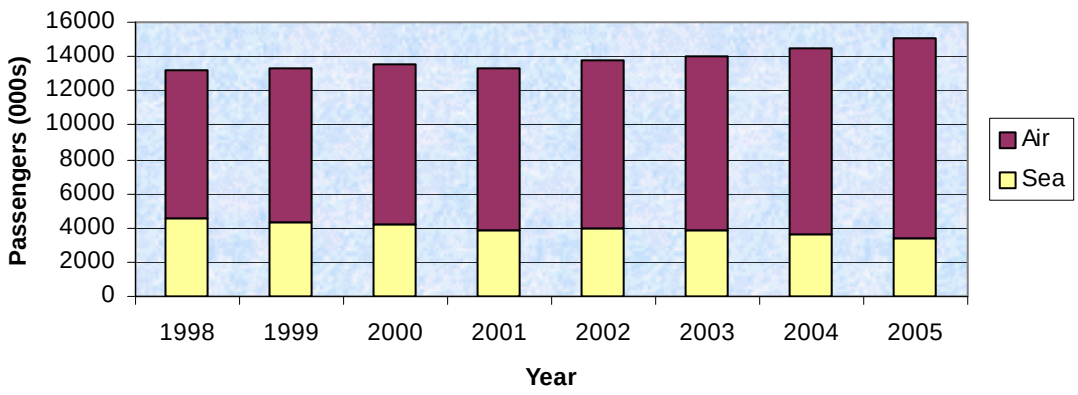


Table 1.6: Air and Sea Market Shares on Ireland-UK Market, 1998-2004:

Year	1998	1999	2000	2001	2002	2003	2004	2005
Air	65%	69%	69%	71%	72%	73%	75%	78%
Sea	35%	31%	31%	29%	28%	27%	25%	22%

1.3.11.6 Domestic Markets:

Aer Arann currently operates all but the Derry PSO services. Ryanair has entered the Dublin-Cork route while Aer Lingus' sole domestic route is Dublin-Shannon. Iarnród Éireann is in the process of updating its rolling stock, which will result in a massive expansion in frequency on the Dublin-Cork line, with other lines to benefit subsequently. This will put added pressure on domestic air links.

[9] Failte Ireland Ireland-UK Air and Sea Trends 2001-2005

1.3.11.7 Market Fragmentation:

In the last couple of years there has been a significant increase in passengers using the provincial and regional airports in Ireland. In 2005, air traffic at Shannon grew by 38%, Cork by 21%, Knock by 42% and Kerry by circa 20%. While these growth rates are far higher than Dublins 8%, of the 2.6m extra passengers[10] that used Irish airports in 2005, the CSO reports that 1.5m of these passengers used Dublin Airport. Dublin is still the leading gateway into the island in passenger volume terms and 75% of international passengers still use the airport.

Despite this, it is clear that the regional airports will have a growing impact on air traffic. An increasingly important consideration for any Dublin Airport forecast is the impact of these airports. This is particularly noteworthy with the increase in services by Ryanair in Shannon and the arrival of Easyjet to Cork, Shannon and Knock[11]. But the main competitive effects of this capacity growth will be felt between these regional airports rather than by Dublin itself because of their significantly overlapping catchment areas. Moreover, while Dublin will lose passengers to the other airports, because its passenger base is far higher than the others, its impact would not be as significant for a regional airport losing the same amount of passengers.

In 2005, the decline in passengers travelling between Dublin and the UK is a clear indication of market fragmentation in Ireland. While its traffic decreased by 1%, Cork traffic to the UK increased by 24% and Shannon traffic to the UK increased by 67%. Overall, across the 3 airports, traffic was up by 7%. Passengers now have cheap fares from provincial airports that fly direct to airports in the UK and Europe, so they no longer have to travel to Dublin by air or by land. Since this is a rather new phenomenon it is difficult to estimate how much of an impact regional airports can have going forward. This becomes increasingly complex when the increasingly competitive environment and the large number of destinations from Dublin are considered, i.e. in April 2006 Ryanair expanded its base to more closely match Aer Lingus' large European network. Since fares remain quite low, it is difficult for another airline in another airport to undercut fares to such a degree that it will attract a large number of passengers out of Dublin. Travellers to Ireland may be more easily swayed to travel to regional airports but since these airports have only a small subset of Dublin's routes, the effect maybe relatively small.

Facilities may also play a role in the attractiveness of other airports. If fares and travel distance are relatively similar from 2 airports in Ireland, passengers are apt to choose the airport that offers a more pleasant experience. Dublin has suffered from congestion over the last few years but its capacity expenditure plans ensure this effect should dissipate over the coming years.

Overall, a large fragmentation effect is not expected. Most of it will probably be experienced on routes to the UK, where we are already applying lower GDP elasticity values to indicate increasing market maturity from Dublin.

[10] www.cso.ie: Statistical Product – Tourism: Passenger Movement (Number) by Direction, Type of Passenger and Month. This traffic excludes domestic and transits passengers.

[11] Easyjet have subsequently announced that they will be dropping these flights from the end of September 2006.

2 Centreline Traffic Assumptions:

2.1 Overall Assumptions:

A number of assumptions were generally applied in preparing the forecasts, unless route level information indicated that these were not appropriate:

- It is likely that load factors will suffer somewhat in 2006 because of the large amount of extra capacity added in Dublin airport. In this situation, demand will not automatically stay in line with supply. As growth falls back to a more normal level in subsequent years, this temporary decline should be quickly reversed. This is especially true since, as yields continue to be under pressure, airlines will drive towards higher load factors as a means of controlling costs. Aer Lingus has repeatedly emphasised that high loads factors are a key strategic objective for the airline and it has succeeded in increasing load factors substantially. Ryanair also continues to operate a high load factor, while other full service carriers state that it is a necessary target to be achieved. Thus while load factors may drop initially, it is assumed that load factor growth over the subsequent years is stronger than in prior forecasts. This has the effect of ensuring that the number of aircraft movements over the period of the forecast does not grow as fast as the passenger numbers.

- As highlighted by the Aer Lingus decision to replace its short haul fleet with a single aircraft family (the A320), airlines will generate economies of scale effects by reducing the number of aircraft types used and moving to a higher gauge of aircraft. Part of the growth in 2006 is because of the rollover effect of the completion of the Aer Lingus and Ryanair migrations to a single large aircraft family/type in 2005.

- Since London and UKP markets are already heavily developed out of Dublin, in previous forecasts it was felt that new route opportunities largely related to continental Europe and to a lesser extent to long haul markets. Trends over the last few years have supported this assumption. Aer Lingus has focused its future development on the European markets. Furthermore, in December 2005 Ryanair announced that it was adding 5 new aircraft to its base in Dublin from April 2006. These aircraft were mainly used to expand its European network. Also, while there have been casualties, a lot of other European carriers have begun and/or expanded services into Dublin. So while some carriers will suffer, this forecast has reinforced the growth potential into Europe compared to the UK.

- While it is possible that further significant stimulation of the market may happen in future years, our centreline scenario assumes that from summer 2007 there will not be another major traffic stimulation step change on the Continent. This is because traffic growth has been accelerated on these routes between 2004 and 2007 (higher than in previous forecasts), so that there will be a limited ability from the airlines to further stimulate traffic by reducing fares even more i.e. a rebalancing effect takes place. Thus growth to Europe in this period (after 2007) is not as strong as in previous forecasts. But this growth will remain considerably higher than in the UK market. The current constrained environment in Dublin airport reinforces this assumption. While continuous improvements in the infrastructure in the airport allow further growth over the next few years, it makes major growth difficult until the second terminal is opened. On the other hand, a range of

scenarios have been developed to cater for situations where extra aircraft are based in Dublin over the next year

- Where major airlines convert to larger aircraft, this may mean that some small UKP routes become uneconomic for these carriers. It is assumed that where this occurs, smaller regional carriers will move in to pick up the developed routes thus vacated by the larger operators.

- In November 2005, a provisional agreement was reached between the Irish and US governments, which provides for a short transitional period from the current "Dual Gateway Regulations" for air services between Ireland and the US. The current situation requires a matching transatlantic frequency to/from Shannon for every transatlantic service to/from Dublin. The transition provides for 3 services to Dublin for every 1 service to Shannon during a period covering 3 scheduling seasons (i.e. Winter 06/07, Summer 07 and Winter 07/08) and from summer 2008 full open skies will begin. This agreement is conditional on the successful conclusion of a EU/US "Open Skies" deal. This deal depends on the US allowing a greater deal of foreign control over US carriers than is currently provided for. There has been a great deal of debate on the US side regarding this change and it is uncertain whether agreement will be reached in time to allow the agreement to come into effect for the winter 2006/2007 season. This will have a knock-on effect on the Irish/US agreement. Transatlantic carriers have always viewed the current system as a barrier to growth. Open skies is viewed as an opportunity to deliver substantial growth into Ireland, with a significant tranche of traffic being shifted from Shannon to Dublin also.

- It can be assumed that operators will upgrade their long haul fleets in the longer term. For instance, Aer Lingus is currently considering the new B787 and A350 long-haul aircraft. Both will be coming into service between 2008 and 2012 (although at this stage, it is unlikely that any B787s will be still available before 2010). The number of passengers carried on these aircraft will be similar to current long-haul aircraft, so this upgrade will not hugely impact on available capacity. It should be noted though that greater efficiencies from these aircraft would be a further incentive to airlines to expand long-haul services.

- Cargo aircraft movements are projected to rise steadily (2% p.a.)

- Increased capacity constraints at Dublin airport militate against the further development of the General Aviation and Training market segments. Weston aerodrome has applied for planning permission to allow further developments there. Such development would encourage general aviation away from Dublin, freeing up valuable slots at the airport. From 2010 we do expect modest growth in the Business Aviation markets.

2.2 Low Growth Assumptions:

For financial planning purposes, a low growth scenario is explored, where all parameters remain unchanged relative to the centreline, except for the GDP values. In this scenario, Irish GDP values were based on the low-growth scenario from the ESRI for the whole period of the forecast (instead of from 2011, as in the centreline forecast). The GDP values used for all other economies are reduced by 1.5% relative to the centreline scenario till 2009 and then by 1% till

2015. These adjustments simulate a significant economic slump in Irish and international economies.

2.3 High Growth Scenarios:

As in previous years, high growth scenarios are used to test Dublin Airport's ability to cope with above average growth in traffic. The level and timing of capital investment depends on the demand for facilities and services at Dublin Airport. Over the last decade there has been above average growth in Dublin airport except for 2001-2002 periods (when the aviation industry was recovering from 9/11 and an economic slow-down). This high growth continuing over the next decade would have a significant impact on demand. As part of the forecasting consultation process, some airlines indicated that they were considering some strong growth scenarios. It is important to see what effect such scenarios would have on capacity requirements if they materialised. These have been incorporated in various high growth scenarios developed.

For the high GDP growth scenario, Irish GDP values were based on the high-growth scenario from the ESRI for the whole period of the forecast (instead of till 2010, as in the centreline forecast). The GDP values used for all other economies are increased by 1.5% relative to the centreline scenario till 2009 and then by 1% till 2015. This simulates a boom for the Irish and international economies.

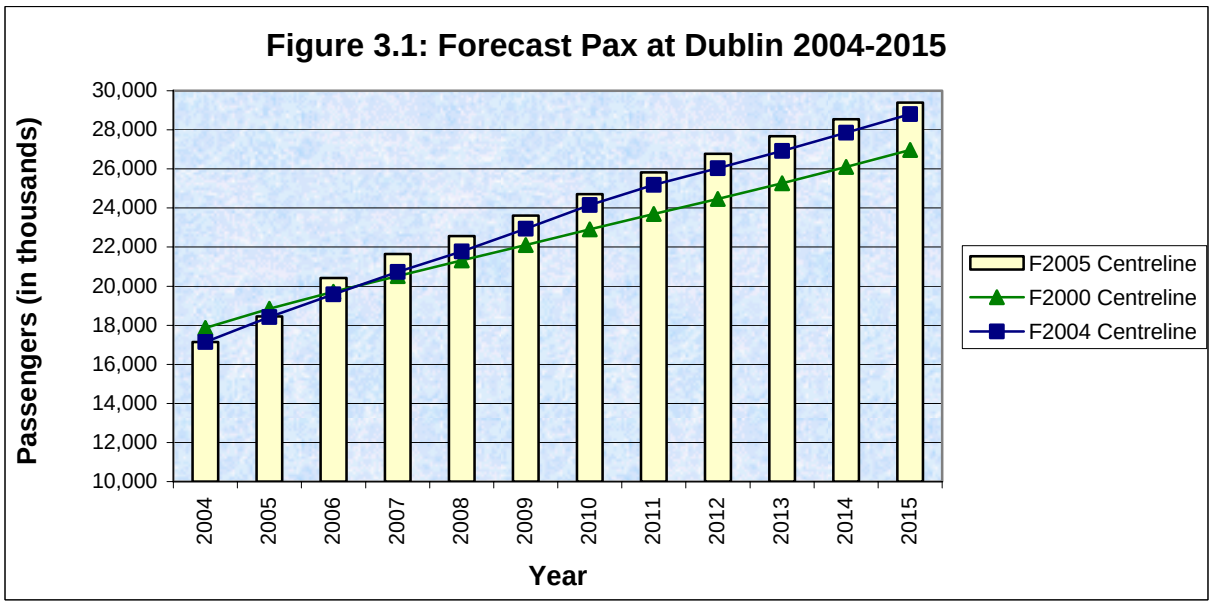
Airline specific scenarios were also investigated, where particular airlines grow at a faster than expected rates.

3 Forecast Results:

3.1 Current Forecast - Dublin:

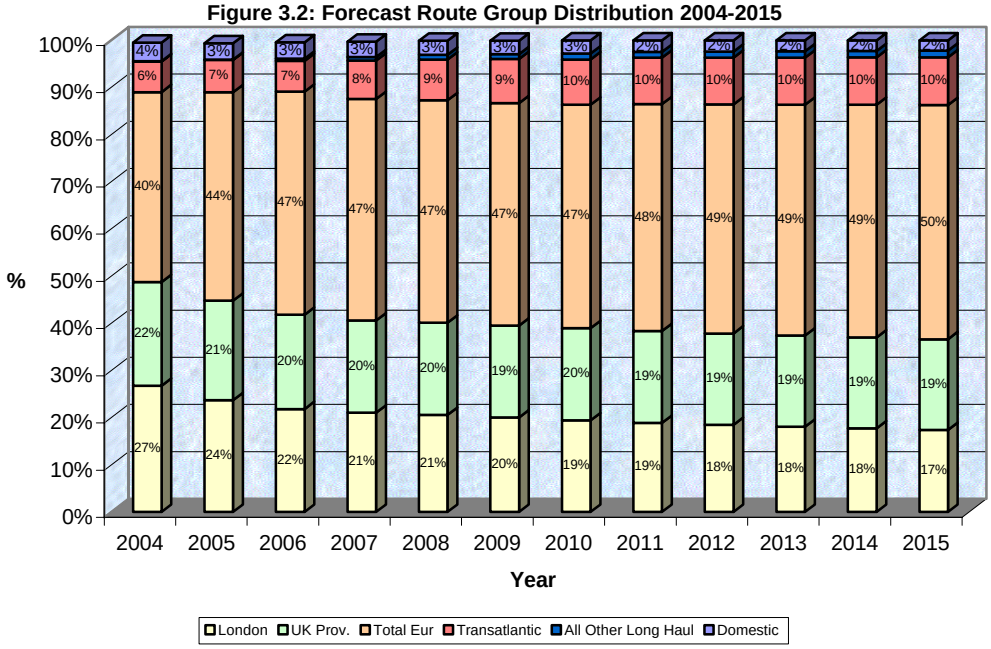
2005 was a strong year for Dublin airport and 2006 is likely to be a record breaking one. This means that in the initial few years, the new forecast is circa one year ahead in passenger numbers compared to the forecast done in 2004. This results in a certain amount of uncertainty, as it is difficult to evaluate how demand will react to the huge increase in available airline capacity over such a short time period. By 2010, it is forecast that this differential is reduced to around a half years extra passengers as this forecast assumes that the UK and Domestic markets are more mature than in previous forecasts. This forecast differential continues up to 2015.

This forecast projects that traffic will reach 29.4 million by 2015, compared with 28.8 million in Forecast 2004. This equates to a growth of over 59% over the next 10 years, with a CAGR of 4.8% p.a., as compared with 4.6% p.a. over the same 10 years for Forecast 2004.



The composition of the traffic is expected to shift markedly over the ten-year period. Traffic on European routes has become increasingly significant in recent years and considering the current growth in 2006, this is expected to continue into the future. Currently Europe comprises 44% of the total traffic. This is expected to grow to 50% by 2015. With Open Skies later on in the decade, the transatlantic market will also grow in importance at Dublin. Transatlantic traffic was 7% of the total in 2005, and is expected to be at 10% in 2015. UK traffic will become proportionally less important, with its overall share declining from 45% in 2004 to 39% in 2015.

Figure 3.2: Forecast Route Group Distribution 2004-2015

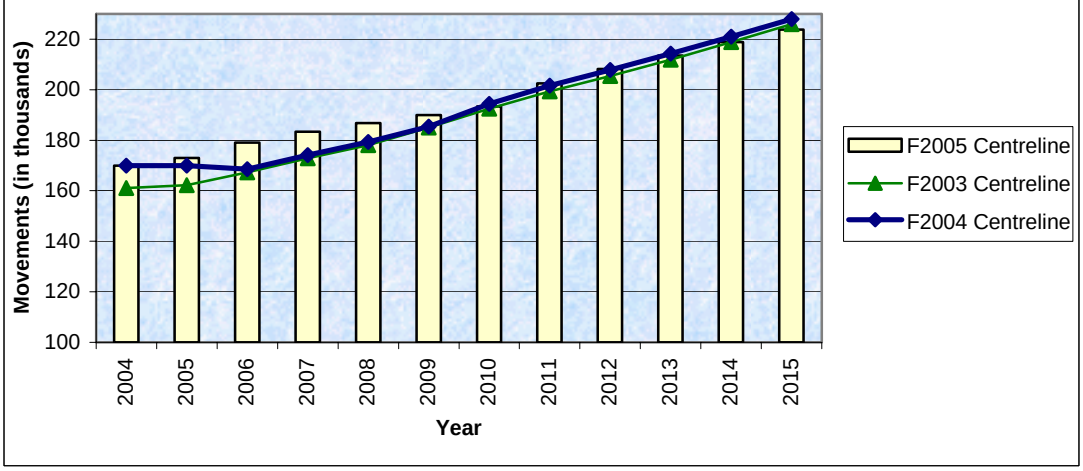


The amount of growth in 2006 leads to quite a large differential between this forecast's aircraft movements and those for Forecast 2004. This initial difference is eroded over the next 10 years because of the further concentration of growth in Europe and away from the domestic and the UK market in this forecast. Airlines have historically utilised larger jets on European routes than in the UK short haul market. In fact in 2005, as well as using jets, 9% of flights to the UK were still operated by small turboprops compared to a relatively insignificant number of such aircraft in Europe. The domestic market has also been affected by the use of jets, which has reduced the total number of movements in this market. Thus, while passenger numbers are higher, larger planes ensure that by 2015 the forecast number of aircraft is lower than in the previous forecast.

Figure 3.3 illustrates that although aircraft movements are expected to grow to accommodate increased passenger numbers, the rate of growth in aircraft movements is expected to be slower than the passenger growth rate. Most of the major operators have now replaced their aircraft with larger types, but it is still expected that the average seat capacity per aircraft will continue to rise, as operators continue to try to squeeze as many seats as possible into aircraft. The long-haul market, which uses large aircraft, continues to grow at a faster than average rate also. Hence, the average number of passengers per commercial passenger movement will increase accordingly, from 112 to 137 over the same period.

Airlines and aviation analysts alike expect higher average commercial load factors in the future. The average scheduled load factor was 75% in 2005, and it is forecast to increase in subsequent years, although not to quite the same levels as in the previous forecast, due to the time it takes for airlines to recover from the huge growth in capacity in 2006 and the bigger aircraft used.

Figure 3.3: Forecast Commercial Movements at Dublin 2004-2015



Forecast Passenger and Aircraft Movement tables

Table 3.1a: Passenger Traffic Forecasts (000) for Dublin

Year	F2000	F2002	F2003	F2004	F2006	F2006	F2006
	Centreline	Centreline	Centreline	Centreline	Centreline	Growth rates	Absolute Growth
2003	16,931	15,916	15,786	15,856	15,856	5.1%	771
2004	17,863	16,780	16,409	17,138	17,138	8.1%	1,282
2005	18,838	17,711	17,350	18,418	18,450	7.7%	1,312
2006	19,720	18,725	18,532	19,586	20,411	10.6%	1,961
2007	20,523	19,688	19,691	20,730	21,653	6.1%	1,242
2008	21,313	20,710	21,005	21,779	22,563	4.2%	911
2009	22,105	21,514	22,204	22,947	23,613	4.7%	1,050
2010	22,907	22,319	23,378	24,147	24,717	4.7%	1,104
2011	23,691	23,097	24,396	25,178	25,823	4.5%	1,105
2012	24,471	23,876	25,281	26,037	26,771	3.7%	948
2013	25,273	24,681	26,198	26,927	27,671	3.4%	900
2014	26,107	25,514	27,150	27,849	28,539	3.1%	868
2015	26,962	26,376	28,137	28,804	29,395	3.0%	856

Table 3.1b: Commercial Aircraft Movement Forecasts (000) for Dublin

Year	F2002	F2003	F2004	F2006	F2006	F2006
	Centreline	Centreline	Centreline	Centreline	Growth Rate	Absolute Growth
2003	167.5	165.8	165.8	165.8	-0.7%	-1.1
2004	171.5	161	170	170.0	2.5%	4.2
2005	174.5	162.2	170	173.0	1.8%	3.1
2006	177.6	167.3	168.5	179.1	3.5%	6.1
2007	181.9	172.9	174.1	183.3	2.3%	4.2
2008	185.5	178.1	179.3	186.8	1.9%	3.5
2009	190.5	185	185.4	189.9	1.7%	3.1
2010	196.3	192.5	194.3	193.4	1.8%	3.5
2011	202.3	199.3	201.6	202.5	4.7%	9.1
2012	208.2	205.4	207.8	208.2	2.8%	5.7
2013	214.5	211.9	214.2	213.5	2.5%	5.3
2014	220.9	218.8	221.0	218.8	2.5%	5.3
2015	227.6	226	228.0	223.8	2.3%	5.0

3.2 Forecast Accuracy:

As mentioned in Section 1.3, a passenger forecast is never "correct", it is merely sound or unsound. It is only as good as the methodology adopted and the assumptions used. The methodology employed has been confirmed by external review as "reasonable". It should also be noted that while some of the assumptions are defined by the airport (e.g. new routes), some are exogenous parameters (e.g. Irish GDP values are defined by the ESRI) and thus outside DAA's control.

In preparing the 2004 forecast, DAA had a good understanding of the traffic in 2005, and the forecast figure was within 32,000 passengers (or 0.2%) of the eventual outcome. On the other hand, in 2004 it was impossible to predict that Ryanair would increase its Dublin base by 50% in 2006. This expansion will result in significantly higher than average growth in Dublin airport in 2006. The forecast does not try to predict such spikes or troughs in growth; instead growth is smoothed out over the years. Thus while the forecast outcome may not be precisely correct for a particular year, it is expected that long term forecast figures would be more closely aligned to actual traffic.

Recent studies in the UK have also underlined the extent to which GDP growth is the key driver for traffic growth. In many cases, variances between the forecast and the actual traffic are likely to be due to differences between the projections on economic growth and the final economic parameter values. As a result, as previously outlined, DAA prepares a range of scenarios to allow for varying parameter values.

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5 Appendix 1 Exogenous Parameters

Table A1: GDP Growth Rates by Country[12]

Year	Ireland	USA	Japan	UK	Germany	France	Italy	Canada	Other Eurozone	Other Europe
2006-2010	5.6	3.1	1.7	2.4	1.6	2.3	1.6	2.9	2.1	2.3
2011-2015	3.1	2.5	1.2	2.3	1.6	2.2	1.6	2.9	2.0	2.2
2016-2020	3.2	2.2	1.2	2.2	1.6	2.1	1.6	2.6	1.9	2.1
2021-2030	2.2	2.2	1.1	2.1	1.5	2.0	1.5	2.4	1.9	2.1
2031-2040	1.5	2.0	1.0	2.0	1.5	1.9	1.5	2.1	1.7	2.0

Table A2: GDP Elasticity by Route Group 2006-2040

Route	Application Duration	Current Forecast
		All
DUB- LON / UKP	2006-2010	1.0 / 1.4
	2011-2015	0.9 / 1.3
	2016-2020	0.8 / 1.2
DUB - EUROPE	2006-2010	1.4 to 1.8
	2011-2015	1.2 to 1.5
	2016-2020	1.1 to 1.4
DUB - TRANSATLANTIC	2006-2010	1.6
	2011-2015	1.5
	2016-2020	1.4
DUB- Other Long Haul	2006-2010	2.0
	2011-2015	1.7
	2016-2020	1.6

[12] Irish GDP data was sourced from the ESRI (Medium Term Review December 2005). Other data supplied by NIESR No. 194 Oct 2005.

Table A3: Airfare Trends

Route	Year	Airfare Growth Trend (%)
DUB–LON	2005-2006	0.6
DUB–PAR	2005-2006	-1
DUB-FRA	2005-2006	-1
DUB-AMS	2005-2006	-1
DUB-BRU	2005-2006	-1
Dub–OSE	2006	-2
Dub – ONE	2006	-2
Dub – NYC	2006-2010	-2
Dub – BOS	2006-2010	-2
Dub – ORD	2006-2010	-2
Dub – OTA	2006-2010	-2
Dub - AOT	2006-2010	-2
Dub – ORK	2006-2008	2
	2009-2010	1
Dub – OEI	2006-2007	3
	2008	2
	2009-2010	1

Table A4: Airfare Elasticities

Route	Current Forecast
	2005-2015
Dublin – London	-0.777
Dublin – UKP	-0.870
Dublin – Domestic	-0.768
Dublin – Europe Scheduled	-0.833
Dublin – Long Haul	-0.944

6 Appendix 2 Calibration Discussion:

One of the key validation procedures in the Forecasting process is reviewing the performance of the model. This can be considered in two dimensions, an internal calibration process and an external calibration exercise.

The internal calibration process involves reviewing the output of the model in terms of a number of parameters, and comparing the results with those obtained in the previous Forecast 2004 study. The obvious comparators include absolute traffic levels and CAGR values, but in addition, a number of output parameters have been examined in terms of values and predicted trends over time in comparison with previous forecasts.

The key performance indicators derived for use in this calibration were as follows:

- Average number of passengers per commercial movement
- Average number of passengers per commercial air traffic movement
- Average load factor
- Average commercial load factor
- Average aircraft size
- Average commercial aircraft size
- Traffic proportion by region
- Movement proportion by region

Trends are consistent with previous analyses, except where assumptions have changed with a consequential effect on some parameters.

External calibration comprised the following basic components:

- Methodology comparison with alternatives (discussed in Chapter 1).

- Comparison with external forecasts produced by Boeing and Airbus. (It must be noted that they give growth in RPKs and not passenger numbers).

- The Boeing Current Market Outlook 2005 predicts a 20-year CAGR of 4.8% with 3.4% for European routes and 4.6% for Europe-US routes which are quite comparable to the 20-year CAGR of 3.7% from the current Dublin Airport Forecast.

- The latest forecast from Airbus is the Airbus GMF 2004-2023. Airbus is predicting an overall annual growth rate of 5.3% till 2023 in passenger traffic, with intra-European traffic showing an average annual growth rate of 5%, and Europe-US traffic growing at 4.9% per annum.

- The World Travel and Tourism Council forecast average growth of 4.1% between 2006 and 2016 in foreign visitor spending in the Irish economy. This compares to average growth of 4.0% in passengers in the Dublin Airport Forecast.

In summary, having reviewed the output of the model under a range of internal and external criteria, the results appear to be robust and reasonable, and broadly consistent with the results of alternative methodologies.