

APPENDIX 1: THE AIRPORT

1 Characteristics of airports

In considering what the likely needs are at and around Dublin Airport, it may be useful to summarise the main components of airport land use and activity in the general sense. This summary is largely drawn from the COFAR study, a European comparative assessment in which Fingal County Council participated. The table below outlines the main points, which are then talked through in more detail.

Main Airport Elements:

- The length and width of **the runways**, coupled with the supporting aeronautical equipment, defines the types of aircraft which can use the Airport. They are the key part of the Airport infrastructure. At present the existing main runway at Dublin Airport is, for example, unable to take fully loaded 747s flying at their maximum range, due to its length.
- The runway is connected to the aprons by a series of **taxiways**. These distribute the aircraft to the parking slots. The location of linkages between the taxiways and the runways define how quickly the aircraft can leave the runway and have an impact on the brief movements which the runway is able to accommodate in a given time.
- The **aprons** are the effective parking zones for the aircraft. They are frequently a restrictive influence on the capacity of the Airport and their organisation is particularly important to the efficient running of the facility. With increasing sizes of aircraft the areas of apron are frequently the major airside component of the Airport layout.
- The aprons feed on to the **terminal**. Terminals may be designed in a variety of ways but a major aim of modern terminals is to link the aircraft directly in eliminating any secondary passenger movements by bussing or similar mode of transport. Dublin is successfully adopting a combination of pier and concourse layouts in order to accommodate the maximum number of aircraft with direct and easy access to the terminal complex.
- The major support activity to the terminals is **car parking and highway access**. In particular car parking requirements are the largest landside land use at any airport. Car parking may be in multi-storey close to the terminals (attracting high parking charges), or spread out at at-grade parking with attendant internal bus links. As airports grow larger, they are frequently unable to contain this car parking which results in a second kind of off-airport parking frequently associated with hotels and mainly with private operators.
- The major aircraft ancillary use is air cargo. This is considered in more detail later; it is carried in the belly-hold of passenger aircraft as well as on special cargo-only flights.
- There are a variety of **other related uses** in support of both aircraft, cargo and passengers, and these may be considered as essential or desirable. The essential uses include aviation fuel and supply, air cargo warehouses, flight catering, aircraft cleaning and minor/emergency maintenance.

It is the characteristics of an airport that define its attractiveness to commercial development, to private investment and to users. Airports may be classified into three broad types:

The originator airport is preoccupied with exploiting the airport catchment area. This catchment area is defined by the airline routes available from the airport. Long-haul routes can generate wide catchment areas. It is fair to say for example that Dublin, for flights to Australia, is within the catchment area of Heathrow, Amsterdam and Paris, as these are alternative options. Equally, short-haul flights have small catchment areas, particularly where there are high speed train options, since railway stations are frequently more accessible and central to a wider catchment area than the airports.

Hubs' basic rationale, it should be recognised, is to suit the operational convenience of airlines, allowing them to centralise facilities and administration in an efficient manner. These do allow however the hub airport to provide non-stop access to many more destinations than a non-hub airport, however frequent air links are; as such they are a powerful incentive to locate business headquarter facilities within that city.

Destination airports are much the more difficult to quantify as by definition the world is their catchment area. Dublin is a classic destination airport. Despite its small population, its many and varied attractions, coupled with it being the base for one of Europe's premier low-cost airlines, make it a very attractive destination for the European short-break holiday. The throughput of the airport is therefore almost certainly only limited by the economy's ability to generate tourist demand.

2 Passenger characteristics

Business traffic

Business traffic consists of small numbers of travellers travelling frequently. Hence the proliferation of frequent-flyer programmes, air-miles and similar incentives, coupled with high-quality lounges separated out from the main departure lounges. It is not unusual for business people to travel once a week or even more.

This itself generates 100 trips per person per year through the airport, meaning that as few as 100,000 people can generate up to 10 million movements at an airport in a normal year. This is significantly increased by, for example, headquarters movements, whereby multi-nationals require attendance of key personnel at HQ from many overseas countries on a regular basis. This market is seen as particularly valuable to airlines as it is not particularly price-sensitive. It is the premier market that airlines seek to develop. It does however generate relatively low commercial revenue for airports.

Leisure traffic

This is the other extreme, representing very large numbers of travellers travelling once or twice a year. It is price-sensitive, but extremely valuable to the airports who generate most of their commercial revenue from this source. It does not require high-quality facilities, as price-sensitive travellers will accept low-cost facilities.

Short-haul traffic

Short haul traffic is broadly intra-European in nature, and over much of the continent it is this segment of the market that is susceptible to transfer to high-speed train. Due to the limited length of flights, probably no more than two hours, it is to a large extent responsible for the early morning peaks which all major airports suffer from. The new range of regional jets are for the first time allowing the smaller regional airports to serve this market.

Long-haul traffic

Long-haul traffic, whether Transatlantic or to other continents, is more dependent on time zone restraints and, with a day set aside for travel, is less subject to access problems.

3 Airline characteristics

Scheduled air traffic does not necessarily equate to business traffic, or Charter to off-schedule. A significant proportion of leisure traffic travels on scheduled flights, whilst Charter traffic, particularly on the major destination routes, tends to operate to regular time slots. There is therefore a significant overlap between both the markets and the operational characteristics of scheduled and charter flights.

Low-cost airlines, meanwhile, are effectively developing because of the high prices currently charged by the national airlines within Europe. By achieving higher load factors than scheduled / full-price airlines, they can reduce their fares substantially and thus generate more traffic from the significant, unfulfilled demand that is undoubtedly available.

4 Airport city elements

The various activities associated with an airport may be sub-divided into four classifications. These are as follows:

- **Operating requirements**

These represent essential facilities necessary to safely carry out basic operations at an airport.

- **Apronside activities**

These represent functions which require direct access to the aircraft on the apron and are commonly assumed to be unable to be performed off-airport.

- **Ancillary airport requirements**

These are activities which may be on-airport or off-airport but are more directly related to the airport function.

- **Commercial airport opportunities**

These are activities frequently located around airports, privately funded, and on non-airport land.

5 Operating requirements

Runways are designed by length and direction, taking account of wind conditions. Of particular relevance to this Study, as we discuss below, is the utilisation of cross-runways. Modern jet aircraft are to large extent independent of the wind conditions. Cross-runways are required by smaller aircraft and by General Aviation which is highly wind-dependent. In terms of land use and environmental intrusion, however, cross-runways can have an impact quite out of proportion to their utilisation by the airport; and yet frequently airports wish to retain them purely because they already exist. There is no case for constructing cross-runways for brand new commercial airports unless weather conditions are extreme or unusual.

Taxiways distribute the aircraft to the aprons. Taxiway layout complements the capacity of the runway, and whilst the location of fast turn-offs, for example, can be problematic, they do not of themselves generate the need for more land take.

Aprons providing the parking slots for the aircraft, both for loading / unloading and for longer stops. In many larger airports, it is apron capacity that determines the restriction on growth, rather than runway capacity. An example of this is Nice-Cote d'Azur Airport, where twin runways feed on to the aprons, which are effectively unable to be expanded. Similar problems are evident at Singapore-Changi, whilst Heathrow also requires careful apron control.

Fire and rescue facilities are provided to strict standards which cover such items as acceleration of fire engines and foam carrying capability, and are related to the size of aircraft which the airfield can handle.

Similarly, **Air Traffic Control** is rigidly controlled to approved standards. Problems of airspace are apparent at several major airports. Eurocontrol is attempting to coordinate all air space activities on the Continent.

Basic site security and fuel storage and distribution complete the essential items necessary for the organising of any aviation activity.

6 Apronside activities

Passenger terminals are traditionally placed adjacent to aprons, linking to the aircraft by piers or buses. With modern concourse-style terminals, as at Stansted and the proposed T5 at Heathrow, it is not apparent that the main terminal facility needs to be adjacent to the apron. Once it is recognised that a separate transport system is needed to move passengers to the aircraft, the parameter becomes time rather than distance. Terminals located 10 minutes away from the passenger concourse, for example, could in distance terms be greater than 10 miles.

At its extreme, this could mean that with an airside link, terminals could be located a significant distance away from the main airport in, say, the nearest centres of population or at a public transport node. The current ownership of airport inhibits thinking of this nature: with the terminal being the major revenue generator of the airport, the building of this facility on land owned by others reduces its attractiveness.

Nonetheless, in terms of the integration of rail and air, coupled with the potential for issuing boarding cards and clearing passports on the train for example, it should have considerable potential.

Cargo Terminals must be located with easy access to the aircraft, as direct loading on to the roadside vehicles on the apron, except in special circumstances, is difficult to manage. Similarly in order to minimise landside movements, warehouses and distribution centres allied to the cargo industry should generally be located as near to the aircraft as possible: allowing onward distribution to be organised more efficiently prior to moving on to the external highway or rail network.

Aircraft Maintenance must be highly accessible to aircraft, but it should be noted that the main criteria for locating these major facilities is now the availability of skilled labour rather than necessarily the base of the aircraft or the cost of the facilities.

For example, the major British Airways maintenance complex is now at Cardiff-Rhoose, and it is no coincidence that this is in close proximity to the major RAF aircraft maintenance facility: many operators are trained within the military, and on demobilisation have a ready civilian job broadly in the same area. Similar co-locations occur elsewhere. These facilities are not normally associated with major hubs, though historically some remain; but in an era of competition they will inevitably move over to third-party operators who could be located at distant facilities.

7 Ancillary airport requirements

Parking: the whole area of car parking is complex in the extreme, involving facilities directly related to terminal buildings, staff parking which is significant, on-airport long-term parking and the potential proliferation of off-airport car parking which can cause considerable problems with associated planning regimes.

Whilst direct rail links are seen to be an integral part of future major airport planning, the need for significant areas devoted to car parking will remain, as it is unlikely that fixed rail links will ever replicate the convenience of good highway access. Many

major airports are aiming for fifty percent public transport landside arrivals for passengers, and this may in some instances be difficult to achieve.

Flight Catering: airports collect a tax on every meal delivered to the aircraft. Airlines insist on competition for this service. This requires the provision of several flight catering establishments. Meals are delivered to aircraft using special vehicles which may require special road licensing. It is therefore considered normal to provide flight catering units on-airport within the operational area with direct airside links. It should be noted however that at Gatwick off-airport facilities are on a closely located industrial estate and this is frequently the case at other airports.

With the outsourcing of meal provision at other institutions, such as major hospitals, it is likely that these facilities, which are extremely efficient at producing meals at low cost, could given a relaxation of the port tax element, prove major suppliers of off-airport catering. This is presently underway at certain airports with the airport itself requiring a much lower port tax on these products.

The potential for this sort of activity is very significant as the market develops. This could well prove to be an example of an industry developed uniquely to serve the aviation market acting as a model for a major off-airport industry with the attendant potential planning problems this might generate in future.

Airport Support Services: these range from minor aircraft maintenance tasks such as cleaning, polishing of aircraft windows, etc., to aircraft maintenance, equipment maintenance and vehicle supplies and maintenance. This is likely to increase as airports develop total cost planning, whereby for example equipment suppliers not only supply equipment but guarantee their performance over an extended period. In future for example bagging handling suppliers may be paid a small sum per bag delivered for the provision of initial equipment, maintenance and upgrading of that equipment, including extending the capacity over the lifetime of a given terminal. This could similarly apply to airfield lighting, fire and rescue equipment, and already applies to many standard vehicles in use at current airports.

As this equipment is required and utilised by a large number of airport users with frequently the airport itself not necessary being the biggest equipment user, the proliferation of maintenance facilities ideally on-airport but more frequently as space becomes a premium, sited locally to the airport becomes likely.

8 Commercial airport opportunities

Parking Operations: much of the supply around major airports is commercially provided. It should be noted that long-stay parking use is seasonal and price-sensitive. The basic price of long term parking at the airport provides the baseline against which commercial decisions are taken on the development of off-airport parking. If this is too cheap, insufficient capacity is provided, resulting in a significant amount of illegal and "fly" parking. If it is too expensive, this encourages a proliferation of commercial operators who will then enter into price wars with the result that the airport car parks themselves could be under-utilised. A balance must be struck, but the planning implications of wrong decision are significant.

Car Hire: with a requirement for mobility at the destination point for both business and leisure traffic, it is likely that car hire will develop along the American model with significant competition driving down the prices, making it much more of a mass market than it might well be at present. The handling of large numbers of car hire changeovers at peak periods is extremely efficient and well organised, but land consuming. Ideally this should take place within walking distance of a terminal, but

due to space constraints at the major airports this is seldom possible. This results in a proliferation of courtesy buses each serving individual users, and in movement terms generates a significant amount of traffic over and above the normal traffic feeding the airport. Courtesy coaches will again be referred to when considering hotels and off-airport parking, but in principle they add a significant element to the heavy traffic normally associated with peak hour activity.

Distribution Hubs: there will be a growing demand for major distribution hubs due to the globalisation of industry and the increasing potential use of airfreight. The location of these hubs will depend very much on the development or otherwise of all-freighter aircraft. However with the growth in air cargo capacity associated with passenger traffic, it is likely that air cargo will always remain a major activity at Dublin Airport, an issue we return to below.

Distribution hubs which could serve the function for example of buffer stores for manufacturing plants, food distribution and more general stores and distribution, should ideally be located adjacent to and as near to the apron as possible allowing efficient travel directly from aircraft to stores. This will allow secondary distribution direct to the manufacturing plant/supermarket to be done directly and in the most cost-effective manner.

Bonded Warehouses: these were originally seen as devices whereby the paying of tax could be offset until the goods were used. Examples include the storage of pharmaceuticals, whisky, etc., whereby taxes and duties could be delayed. Within the European Community this requirement has been reduced significantly, but it is still an activity relevant to goods imported or exported outside the EC. They seldom need to be located at or near airports, but they frequently are required to be by Customs & Excise. With modern electronic monitoring and surveillance techniques there is no reason at all why these could not be located well away from areas of congestion.

High-Tech Manufacturing: this is an extreme example of just-in-time manufacturing techniques whereby equipment is manufactured on an as-ordered basis with worldwide supply centralised at competitive manufacturing countries. Within Europe the two areas for these are Ireland and Southern Scotland. Ultimately they might well be caught up in congestion at the major airports serving these facilities and are likely to divert to the major cargo facilities which may well be developed as described earlier. Volumes are not high and the number of vehicles attracted is comparatively small, particularly when compared with the value of the goods produced.

Business Parks: for the purposes of this Study, business parks are defined as offices set within high-quality infrastructure with easy parking. It is frequently argued that these should be located adjacent to airports because of the requirements for a high number of business travellers. The key element in defining distance from airport is the time taken to get to the airport. For business parks this might normally be considered up to sixty minutes travel time. Dependent on the access provision to the airport this would be up to fifty/sixty miles away. The reason that many airports plan business parks is that the airport is the best centre of transport links outside the city centre; coupled with, at least initially, lower land costs it makes for a good commercial deal.

From the point of view of the introduction of additional pressure on the transport links they are highly undesirable. As most business travellers will not require to visit the office before travelling but will travel straight to the airport for an early morning start.

Mid-day business flights are notoriously difficult to fill, whilst early morning and early evening flights are frequently capacity driven.

Hotels: the throughput of many airports is directly proportional to the hotel capacity in the region. This certainly applies to smaller islands such as Jersey, and may well be an issue for Dublin. The throughput of Dublin Airport is most certainly influenced by the overall planning policies on hotels on a Dublin-wide basis and conceivably on a countrywide basis. It indicates that capacity constraints on airports are frequently dictated by events outside the airport's control.

With respect to location of hotels in the airport vicinity, the major decision for the passenger is whether it is possible to walk to the hotel or whether transport is essential. Once the decision is taken to engage transport then the key parameter is time not distance. The location of airports physically around the perimeter of major hotels compounds the problem, because private taxis, for example, resent short journeys from major airports when most people using their services require long journeys to the city centre. Similarly if a fixed rail link is favoured, the hotels should be associated with the stations along the line; but much the best solution in planning terms is to take the traveller direct to where they wish to go, which in a high percentage of cases is likely to be the city centre with its obvious attractions.

By allowing the proliferation of hotels around the perimeter and due to the circumstances outlined above, the only possible way of serving these hotels is to introduce a proliferation of courtesy buses, each one competing on levels of comfort and frequency. This has an effect on congestion out of all proportion to the passenger utilisation.

9. Growth at Edinburgh Airport

The UK's Airports White Paper expects demand at Edinburgh Airport to grow from 7 million passengers per annum to 20 million by 2030. The Government believes there is a good economic case for the phased development of additional runway capacity by:

- Making full use of the existing main runway by building a full-length parallel taxiway, a new control tower, additional terminal capacity and more aircraft stands; and
- Constructing a new parallel main runway, probably around 2020, whereupon the crosswind runway would be closed and used only for taxiing.

The planning implications include:

- Forecast passenger growth will create major additional surface transport flows to the airport. To deal with this without exacerbating congestion on the surrounding road network will require large-scale investment in new transport infrastructure. Work is already underway on promoting new rail links and the Councils' West Edinburgh Tram scheme is approaching Parliamentary submission stage, with a projected implementation date of 2009.
- The issue of new roads has still to be addressed. It is clear that the scale of transport development envisaged will need major investment from central Government and the private sector, including the airport itself.

- The proposed developments will have unavoidable environmental impacts and, as part of the process of establishing the land to be safeguarded, these will need to be rigorously assessed as part of a formal Environmental Assessment at the planning application stage. This will need to cover air quality, landscape, nature conservation, flooding and, of course, noise. The White Paper suggests that the new runway could actually deliver noise benefits by reducing the use of the existing runway for inbound flights. There would also be a reduction in the number of night movements flying directly over Cramond.

Many of these implications will be reflected in a revision of the 2003 West Edinburgh Planning Framework that will set the context for this strategically significant growth area.