



# Cork Airport Future Needs Study

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prepared by KSA  
for Cork County Council



## Table of Contents

Executive Summary .....	3
1.0 Introduction .....	4
1.1 Overview and Purpose of Study .....	4
1.2 Study Structure .....	4
2.0 Location and Strategic Importance of Cork Airport .....	6
2.1 Location and Site Description .....	6
2.2 Strategic Importance .....	8
2.3 Relevant Policy Context .....	8
3.0 Assessment of Existing and Future Aviation Related Growth .....	12
3.1 Categories of Assessment .....	12
3.2 Assessment of Existing Growth .....	12
3.3 Assessment of Future Growth .....	22
4.0 Strategic Phasing of Future Airport Needs .....	26
4.1 Introduction .....	26
4.2 Strategic Phasing of Future Development .....	30
4.3 Summary .....	43
5.0 Environmental and Safety Related Issues .....	45
5.1 Introduction .....	45
5.2 Future Development and Associated Environmental Issues .....	45
5.3 Public Safety Areas .....	49
5.4 Noise Contours .....	53
5.5 Future Environmental Assessment .....	54
5.6 Conclusion .....	56
6.0 Recommendations, Further Areas of Study and Conclusions .....	57
6.1 Introduction .....	57
6.2 Recommendations .....	57
6.3 Areas Requiring Additional Study .....	61
6.4 Implementation .....	64
6.5 Conclusions .....	65
Appendix 1 Illustrations .....	66



## Executive Summary

The growth and development of Cork Airport is crucial to the future prosperity of Cork City, County and Region. National and international access to the Cork metropolitan area and surrounding hinterland is a critical ingredient of the area's future growth, particularly in terms of economic prosperity and supporting and developing indigenous and foreign investment. Cork Airport is a vital element of national transport infrastructure which harnesses economic and social development and growth. The airport is a key element of the regional infrastructure of the South West.

The purpose of the Cork Airport Future Needs Study is to establish the future needs for Cork Airport up to 2040 so that the future operation and growth of the airport can be ensured and its economic potential maximised. The undertaking of this study will provide clear guidance and direction for Cork County Council in the preparation of the Special Local Area Plan (SLAP) for Cork Airport. It is essential that the future aviation-related operation and growth of Cork Airport is ensured while also maximising opportunities and economic potential.

The future needs study area is effectively that area which is defined by the boundary of Cork Airport, giving an overall physical area of approximately 248 hectares. The study area is zoned objective X-03, i.e. Cork International Airport, as set out in the Carrigaline Electoral Area Local Area Plan 2005.

The assessment of existing growth is examined through the analysis of a number of interlinked areas which are passenger and aircraft movements, runway and aircraft parking stand utilisation, cargo tonnage, and car parking. Future growth assessment will relate to forecast annual passenger and aircraft movements, annual cargo tonnage throughput and annual car parking demand up to 2040.

It is essential to determine the various strategic future needs, particularly in terms of infrastructure and service requirements, for the short-, medium- and long-term growth and development of Cork Airport up to 2040. The future needs of Cork Airport for this 30+ year horizon are assessed in three phases, namely, short-term 2008-2012, medium-term 2013-2020 and long-term 2021-2040. The future needs for each phase are determined under the airside, landside and terminal components of the airport complex system.

Specific planning provision needs to be made for a future incremental increase in the capacity of Cork Airport to cater for the forecast growth in passenger and aircraft movements and cargo tonnage.

During the various stages of development over the short-, medium- and long-term time periods it will be necessary to carry out various types of strategic and detailed environmental assessment. Public safety and noise zones need to be established on Local Authority maps and further studies will be required in these areas in line with the future growth and development.

It is essential that the identified future needs for Cork Airport are strategically provided for over the 30+ year timeframe of this study to ensure the continued growth and development of the airport, thus enabling this significant infrastructure asset to play a pivotal role in the ongoing socio-economic advancement of Cork County, City and South West Region.



## 1.0 Introduction

### 1.1 Overview and Purpose of Study

Airports provide the necessary infrastructure to facilitate the movement of passengers and goods from land through to the air space. The growth of air travel, like the growth in all other forms of transportation, has had and will continue to have a significant impact on the development potential of local, regional and national economies, generating concentrations of population and increasing the expansion of urbanisation and economic activity. Air travel has the consequence of bringing cities, regions and countries closer together in terms of time, thus allowing for greater interaction, cooperation, development, etc, to occur.

Airport infrastructure has developed to meet the needs of advancements in aircraft technology. Airport terminal buildings have developed to cater for the growth in passenger and freight traffic and also to cater for the changing requirements of passengers. With the changing of requirements, airports have now adopted an additional role, that of being commercial entities to serve their different types of users. The airport system can be seen as an essential link between many modes of transport and every constituent of the airport system contributes to the successful operation of this link.

Transportation driven developments generally lead towards regional decentralisation with possibly lower densities than that of central urban areas. However, the quality of the new transport infrastructure has been instrumental in encouraging new development. Many northern European planning systems have in recent years more fully recognised the link between land use planning and transportation, and particularly aviation. This has in turn led to higher densities close to transport nodes and hubs. This is most recently evident in the government's Sustainable Residential Development in Urban Areas (Consultation Draft Guidelines for Planning Authorities) (published in February 2008).

The purpose of this report is to put forward the various strategic future needs of Cork Airport, particularly in terms of infrastructure and service requirements, up to 2040. The establishment of these future needs will ensure the necessary growth and development of the airport over a 30+ year horizon period and also enabling the maximisation of its economic potential. The undertaking of this study will provide clear guidance and direction for Cork County Council in the preparation of the Special Local Area Plan (SLAP) for Cork Airport.

The growth and development of Cork Airport is necessary to assist in the development and future prosperity of Cork City, County and Region. Cork Airport, as a vital element of national transport infrastructure, will harness economic and social development and growth.

### 1.2 Study Structure

The first stage of this study involves a brief description of the current airport site and an outline of the airport's strategic importance to Cork City, County and Region. A strategic review and assessment of existing Aer Rianta/Dublin Airport Authority development plan/land use studies for Cork Airport is carried out along with a review of all relevant national, regional and local planning policy. This sets the basis for the study in that the airport's strategic importance is outlined and the parameters are set for the various needs for the airport's growth as outlined in the range of policy documents examined in Section 2.

A strategic assessment of existing and future aviation related growth, both passenger and aircraft, and associated aviation related development requirements are carried out in Section 3. This analysis will provide the basis for the assessment of the various strategic future needs for Cork Airport.

It is essential to determine the various strategic future needs, particularly in terms of infrastructure and service requirements, for the short-, medium- and long-term growth and development of Cork Airport up to 2040 and this is dealt with in Section 4. Through assessment, analysis and discussion a clear strategic approach has been established to enable the determination of the airport's future needs for this 30+ year time period. This future needs development strategy is assessed in three phases, namely, short-term 2008-2012, medium-term 2013-2020 and long-term 2021-2040. The future needs for each stage are assessed under the airside, landside and terminal components of the airport system. Associated with each



of these phases is forecast annual growth in passenger and commercial aircraft movements, together with annual cargo tonnage throughput increases and future car parking demand.

The relevant environmental and public safety issues are an important element of this study and are assessed in Section 5. In considering these issues it is important to make references and draw recommendations from various published studies on Cork Airport. These include the Land Use Masterplan Study (Scott Wilson 1996), the Cork Airport Development Plan 1999, the Environmental Impact Assessment of the Terminal Development (Environmental Impact Services Limited 2001), the Environmental Assessment of the Intensification of Airside Operations at the Airport (Environmental Impact Services Ltd 2007) and the ERM (Environmental Resources Management) Report on Public Safety Zones for Cork, Dublin and Shannon Airports (Environmental Resources Management Ireland Ltd 2005). Public safety and noise zones need to be assessed and continually monitored with the continued required expansion of the airside, landside and terminal components of the airport.

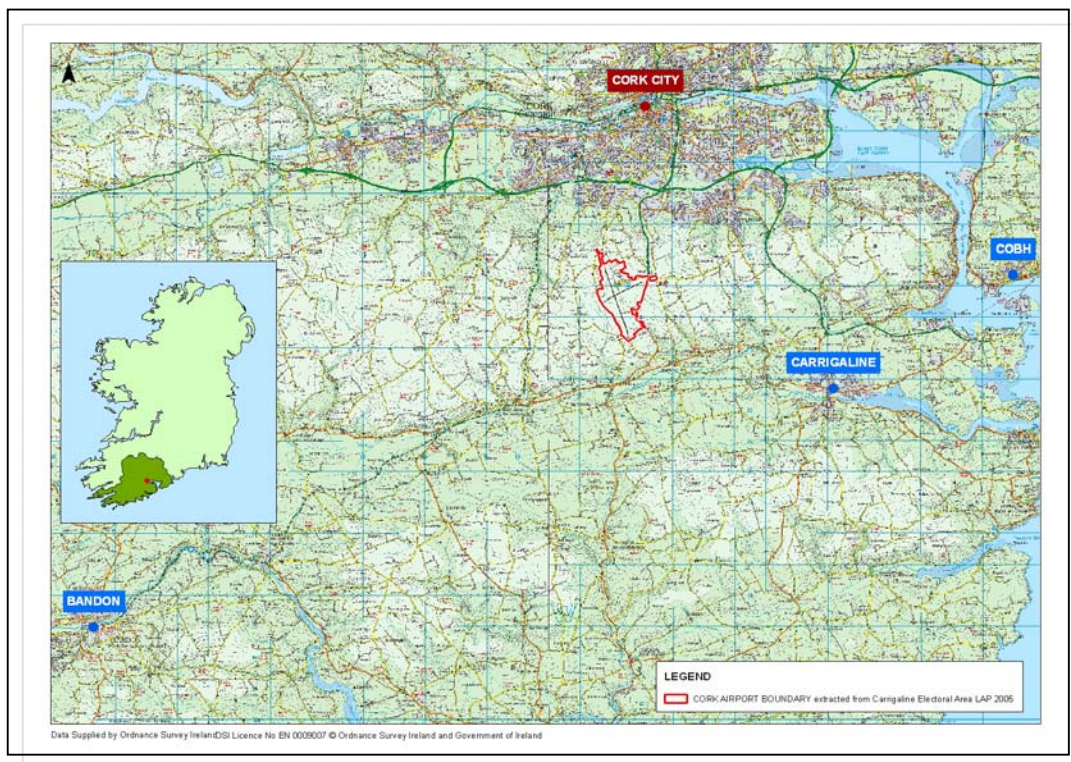
To conclude the study it is necessary to set out recommendations outlining the airports future growth and development up to 2040. These recommendations are set out in Section 6 and follow on from the findings in sections 4 and 5. The recommendations are classified under the various airport components and will cater for the short-, medium- and long-term development and growth of the airport. Following on from these recommendations a number of critical areas are identified in which additional study will be necessary in line with the future growth and development of Cork Airport up to 2040.

During the preparation of the Cork Airport Future Needs Study extensive stakeholder consultation was undertaken by the consultants, which proved very beneficial and informative particularly regarding the determination of the strategic future needs for the airport. Meetings were held with Department of Transportation, Department of the Environment, Heritage and Local Government, Irish Aviation Authority, Cork Airport, South West Regional Authority, Cork City Council, IDA Ireland, Fáilte Ireland, Cork Chamber and Bus Éireann. The National Roads Authority (NRA) was contacted as part of the stakeholder consultation process, and a series of questions were issued to the NRA by the consultants and a written response was received. A follow meeting was held with the NRA to further discuss the issues of concern raised by the NRA. In summary, the issues raised by the consulted stakeholders can be categorised under the headings of aviation, transportation and general.

## 2.0 Location and Strategic Importance of Cork Airport

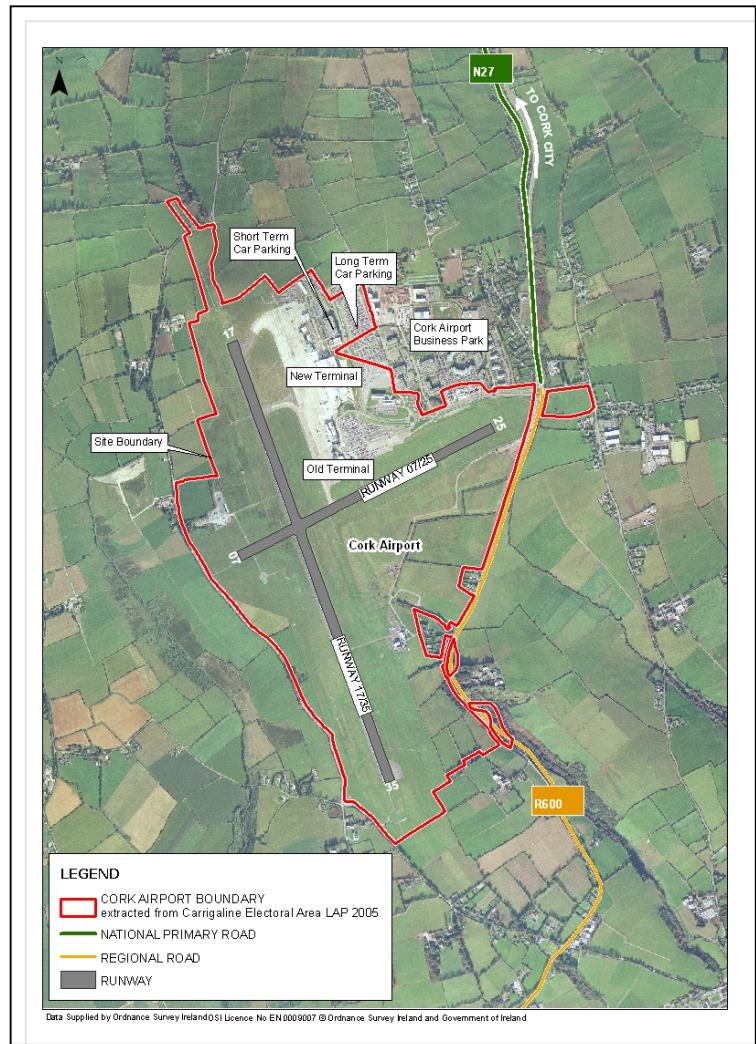
### 2.1 Location and Site Description

The future needs study area is effectively that area which is defined by the boundary of Cork Airport, giving an overall physical area of approximately 248 hectares. The study area is zoned objective X-03, i.e. Cork International Airport, as set out in the Carrigaline Electoral Area Local Area Plan 2005. The site is located on an elevated plateau about 5kms south of Cork City Centre. The urban fringe of Cork lies approximately 2kms to the north of the airport. The majority of the nearest urban fringe land uses are light industrial/commercial. Maps 2.1 and 2.2 clearly illustrate the location of Cork Airport from a national, regional and local perspective and boundary extent<sup>1</sup>.



Map 2.1 Cork Airport Strategic Context

<sup>1</sup> The current operational area of Cork Airport extends beyond the airport boundary as set out in the Carrigaline Electoral Area Local Area Plan 2005 specifically regarding the provision of long-term car parking.



Map 2.2 Cork Airport Location and Boundary

Cork Airport is accessed from the N27 National Primary Route. The primary operational aviation elements of the airport complex consist of a collection of 2 runways and associated apron/taxiway areas, aircraft parking stands, a new passenger terminal building, cargo warehouses, access/egress surface and multi-storey car parking, and other ancillary airport buildings.

The runways at the airport are classified as follows:

- |                         |  |
|-------------------------|--|
| <u>Principal Runway</u> | Runway 17-35: Length - 2,100m, Orientation - North-South, Classification - ICAO Category II <sup>2</sup> |
| <u>Secondary Runway</u> | Runway 07/25: Length - 1,310m, Orientation - East-West, Classification - ICAO Category I <sup>3</sup>    |

<sup>2</sup> ICAO (International Civil Aviation Organisation) Category II is a precision approach instrument runway served by an Instrument Landing System (ILS) and visual aids intended for aircraft operations with a decision height lower than 60m but not lower than 30m and a runway visual range not less than 350m.

<sup>3</sup> ICAO Category I is a precision approach instrument runway served by an ILS and visual aids intended for aircraft operations with a decision height not lower than 60m and either a visibility not less than 800m or a runway visual range not less than 550m.



The new Passenger Terminal Building is approximately Area 28,300 sq. metres and is designed to cater for 3+ million passengers per annum (mppa) and with the capacity to expand to take up to 5 million mppa.

## 2.2 Strategic Importance

The development and expansion of Cork Airport is crucial to the development and future prosperity of Cork City, County and Region. It is essential to ensure both national and international access to provide for the future economic growth. Cork Airport is considered as an integral part of national transport infrastructure that harnesses economic and social development and growth.

The Carrigaline Electoral Area Local Area Plan, adopted in 2005, included an objective to initiate the preparation of a Local Area Plan to encompass the site of Cork International Airport and its surrounding hinterland. The Carrigaline Local Area Plan includes a map identifying the boundaries of the airport, an area of 248 hectares. The zoning objective X-03, included in the LAP simply refers to Cork International Airport i.e. does not identify particular uses within the boundary.

The Draft County Development Plan 2007 indicates that a SLAP will be prepared for Cork Airport which will address the particular land use requirements of the airport and its associated hinterland. It is envisaged that the SLAP will identify land that may be required in the future to enhance the operational capacity of the airport; identify land for transport improvements linking the Airport to the City Centre, including light rail and Bus Rapid Transit, take account of the overall strategy of this future needs study, identify appropriate land uses that would benefit from the airport location and have regard to public safety zones identified by the Airport Authority.

Aer Rianta commissioned the Cork Airport Development Plan in 1999. The boundary for the airport site identified in the Carrigaline LAP 2005 largely coincides with the boundary of the long-term land use plan contained in the 1999 Aer Rianta Airport Development Plan.

The Cork County Development Plan 2003 recognises the essential role of the airport in the economic and social development of the region and includes a number of objectives in relation to supporting Aer Rianta's programme for the operation and development of the airport, safeguarding the airport from inappropriate uses that could compromise its long-term development and contribute to traffic congestion in the area, protecting airport safety corridors and improving access.

Air services to and from Cork Airport currently provide vital links for business and tourism, and play a key role in attracting and retaining inward investment. Cork Airport currently serves numerous European cities with approximately 115 flights per day in 2008. Owing to increased local prosperity and the introduction of low-cost airlines, the local and regional catchment population increasingly use the airport to access a wider range of economic, social, cultural and leisure opportunities and services than are available locally. The area immediately adjacent to Cork Airport is a key location for employment uses that would depend upon the proximity of the airport for their viability.

Cork Airport is of major strategic socio-economic importance to Cork City and County, the South West Region and for the Atlantic Gateway Corridor.

## 2.3 Relevant Policy Context

### National Policy

#### National Spatial Strategy (NSS) 2002 – 2020

The National Spatial Strategy (NSS) is a twenty-year planning framework designed to deliver more balanced social, economic and physical development between regions in Ireland. It provides a national framework and policy guidance for the implementation of regional, county and city plans. In order to focus development in the eight identified regions in Ireland the NSS proposes that areas of sufficient scale and critical mass will be built up through a network of *'gateways'*, *'hubs'* and *'development centres'*.

As set out in the NSS the South West Region, which consists of counties' Cork and Kerry, will contribute to balanced regional development through Cork City as a national/international gateway, supported by the hub of Mallow and the linked-hub of Tralee-Killarney. It is anticipated that Cork will build on its substantial





and established economic base to lever investment into the South West Region. It will do this with the support of its scale of population, third level institutions and substantial capacity for growth identified in the Cork Area Strategic Plan (CASP). Implementation of CASP is important to secure the objectives of the NSS. Appropriate implementation structures supported by the local authorities and State agencies will be needed to drive this strategic plan forward. The provision and development of airport infrastructure is of vital importance to the successful implementation of the NSS, therefore, Cork Airport has a crucial role to play.

#### National Development Plan (NDP) 2007-2013

The National Development Plan (NDP) 2007-2013 termed '*Transforming Ireland - A Better Quality of Life for All*' sets out the roadmap to Ireland's future. The NDP integrates strategic development frameworks for regional development, rural communities, all-island co-operation, and protection of the environment with common economic and social goals.

Cork Airport is seen as a key element of infrastructure, with a significant catchment population base and will continue to have an important role in the future by facilitating direct air services to many international locations. The airport is, therefore, an important instrument in the development of the regional economy. The challenge for Cork Airport is to continue to meet the regional transport needs and to respond to regional growth. The airport has experienced significant passenger growth in recent years and there is the potential for further growth.

One of the key development priorities for the Gateway of Cork as identified in the NDP 2007-2013 is to improve both road and bus based public transport linkages to Cork Airport.

#### Regional Policy

##### Atlantic Gateways Initiative 'Achieving Critical Mass' (2006)

The Atlantic Gateway concept is a long-term initiative with the initial phases being concerned with the development and creation of awareness of its potential, while laying out transport infrastructure and other critical enabling elements followed by practical cooperation centred on marketing and branding.

The Atlantic Gateways Initiative aims to establish greater levels of connectivity and synergies between Cork, Galway, Limerick and Waterford across areas such as economic development, physical infrastructure as well as social and cultural advancement and development. The basic premise of the concept is that by cooperation in relevant areas, the development potential of all of the four gateways will be enhanced.

With consideration of the networks of ports and airports in and or near the Atlantic Gateways, what is striking is the range of domestic and international destinations, representing a key asset with which to position international potential and connectedness. Dublin offers an even greater range and frequency of services, however, as the associated congestion issues becomes more exacerbated and through continued access improvements amongst the Atlantic Gateways, there is the potential to develop credible national level complementary facilities to those on offer in Dublin.

The key priority is the delivery of the Transport 21 programme of connectivity improvements between the Atlantic Gateways and Dublin and particularly between the Gateways themselves.

##### South West Regional Planning Guidelines (2004)

The Regional Planning Guidelines (RPGs) for the South West Region have been developed on the strength of guidance provided through the NSS and a wide range of existing plans that exist at individual agency level within the Region.

The task of the RPGs is to provide a broad canvas to steer the sustainable growth and prosperity of the Region and its people, over the sixteen-year period up to 2020. The RPGs contain statements and



analysis of key economic objectives, together with a set of planning guidelines to be incorporated within the development plans of the local authorities in the Region.

The RPGs recognise that national and international access to the Cork Metropolitan Area is a critical ingredient of the area's future growth and Cork Airport is a vital element of national transport. The airport is a particularly key element of the regional infrastructure of the South West, particularly in terms of future economic growth and development. The level of growth at Cork Airport has risen considerably in recent years, and it is envisaged that such growth levels will continue for the foreseeable future. In this regard, the RPGs state that specific planning provision needs to be made for a future incremental increase in the capacity of Cork Airport to handle large volumes of passengers and freight, as well as larger aircraft, possibly serving long-haul international routes. The continued development of airport facilities and the expansion in routes serviced, providing direct international connections, is essential to promoting the South West Region as a high-quality destination for inward investment and tourism.

#### Cork Area Strategic Plan (CASP) 2000-2020

The Cork Area Strategic Plan (CASP) is an initiative jointly sponsored by Cork City Council and Cork County Council in order to provide a vision and strategy for the development of the Cork City-Region up to 2020. CASP seeks to reflect spatial planning guidance that is emerging from initiatives such as the NSS and the NDP which encourages Gateway centres such as Cork to develop as the focus of successful and innovative regions.

CASP recognises that the development and expansion of Cork Airport is crucial to the development and future prosperity of Cork. The economic development of the region will depend on inward investment and in-migration of labour. Continued improvements in air links and ease of access to the UK and European hubs are essential to fostering and promoting the Cork Region.

CASP puts forward the following objectives based on the strategic importance of Cork Airport:

- Development of a quality bus corridor from the airport to the City Centre and Kent Station, with associated traffic priority measures, providing a high frequency service;
- Development of specialist logistics/distribution facilities linked to air transport located in close proximity to the airport;
- Provide improved air service to international destinations.

#### Cork Area Strategic Plan (CASP) – Strategy for Additional Economic and Population Growth – Update 2008

This draft update of CASP is designed to build on the strengths of Cork and to facilitate Cork to become a leading competitive European city-region. It takes account of revisions needed to reflect economic, market and policy developments since the original CASP was prepared and places particular emphasis on the implementation of policies to achieve the goals of CASP. It also includes an increased focus on the economic and investment strategy. The updated Strategy has also been designed to meet the Government's national policies on spatial strategy and on climate change adjustments.

Similar to before, the CASP Update recognises the crucial importance of the future development and expansion of Cork Airport. With the recent completion of the new passenger terminal building no major airport infrastructure requirements have been identified in the short-term. In the medium-term provision should be made for a runway extension and associated works to enable larger aircraft and long distance routes to be accommodated. Access to the airport is via a single road-based location and congestion can occur and future improved accessibility and connectivity to the wider region will be required.



### ERM Public Safety Zones Report (2005)

ERM (Environmental Resources Management) Ireland Ltd was commissioned by the Department of Transport and the Department of Environment, Heritage and Local Government (DoEHLG) to investigate Public Safety Zones (PSZs) at Ireland's three state airports, namely, Cork, Dublin, and Shannon.

The purpose of PSZs is to protect the public on the ground from the small, but real possibility that an aircraft might crash in a populated area. Essentially, a PSZ is used to prevent inappropriate use of land where the risk to the public is greatest. The report established new PSZs for the three airports<sup>4</sup>.

### Local Policy

#### Cork County Development Plan 2003-2009

The County Development Plan formally came into operation in February 2003. It is a six-year Development Plan for the county that sets out the Council's planning policy for the county for that period. The Plan is due to be updated in 2009.

Within the Development Plan, Cork Airport is recognised a key gateway to the south of Ireland and the availability of convenient and frequent air services facilitating the business community are key factors in its successful economic growth. Likewise, regional tourism also benefits greatly from Cork Airport as an international access facility. A pre-requisite of the continued growth of airport-related activities are adequate and efficient road access with appropriate public transport facilities.

The Development Plan puts forward the following objectives for Cork Airport:

- To recognize the essential role of the airport in the economic and social development of the sub-region.
- To support the airport's future operation and development.
- To consider any development of lands around the airport on safety and environmental grounds (including noise) and generally to safeguard the area from inappropriate uses that could compromise the long-term development and economic potential of the airport. Subject to normal proper planning considerations, any proposals for airfreight-related logistics development should generally be located in close proximity to the relevant cargo handling facilities.
- To acknowledge the necessity for the airport safety corridors.
- To support the provision of improved access to and from the airport and to ensure that the pattern of land uses within the vicinity does not compromise the strategic importance of the airport through traffic congestion.

#### Cork City Development Plan 2004-2010

The Cork City Development Plan sets out Cork City Council's policies for the development of Cork City for the six-year time period. The Plan has established that the proximity of Cork Airport is a major asset for the city, and high quality linkages by car and public transport to the airport are essential to make the most of this asset.

#### Carrigaline Local Area Plan (LAP) 2005

The Carrigaline LAP was formally adopted by Cork County Council in September 2005. It is a six year plan for the Electoral Area that sets out the area's planning policy.

The Plan recognises that Cork Airport is an important strategic asset to the area and its importance is recognised through the specific objectives. The airports, and the associated developments in logistics, the Airport Business Park and hotel facilities, are all key elements in the development of the county and the South West Region.

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<sup>4</sup> Section 5 of this report sets out in detail the implications for Cork Airport of the ERM Report.



## 3.0 Assessment of Existing and Future Aviation Related Growth

### 3.1 Categories of Assessment

The primary categories of assessment of growth related to passenger and aircraft movements, i.e. commercial movements consisting of scheduled, unscheduled, cargo and general aviation movements that are revenue generating, cargo tonnage and car parking. The existing growth has been assessed from 1995 to 2007 so as to establish clear trends for over this time period. As this Future Needs Study is strategic in nature the future growth assessment has been taken up to the year 2040.

The assessment of existing growth is examined through the analysis of a number of interlinked areas which are passenger and aircraft movements, runway and aircraft parking stand utilisation, cargo tonnage, and car parking. Future growth assessment will relate to forecast annual passenger and aircraft movements, annual cargo tonnage throughput and annual car parking demand up to 2040.

### 3.2 Assessment of Existing Growth

#### Passenger Throughput Growth

As illustrated in Table 3.1 and Graph 3.1, the total annual terminal passenger<sup>5</sup> throughput at Cork Airport has increased significantly from 1995 to 2007 from approximately 962,800 to just over 3,173,800, representing an annual percentage growth increase of almost 10%. In line with this annual growth, both the busiest total passenger month and day have continued to grow, however, the ratios of busiest month and busiest day to annual passengers have decline over the period reflecting the '*peaking spreading*' of passenger throughput with a greater utilisation of infrastructure and facilities being achieved<sup>6</sup>.

The occurrence of peaking spreading is also clearly evident through the analysis of departure, arrival and total '*typical busy*' hour passenger movements through the airport. Table 3.2 and Graphs' 3.2 and 3.3 display that while the departure, arrival and total passenger '*busy hour rates*'<sup>7</sup> have all increased annually since 1995 the ratios of these to the corresponding annual passenger throughput are all decreasing.

<sup>5</sup> Terminal passenger throughput will generally be slightly less than total passenger throughput as transit passengers, i.e. passenger who remain on arriving aircraft for a subsequent departure, are excluded as these passengers do not enter or use terminal facilities.

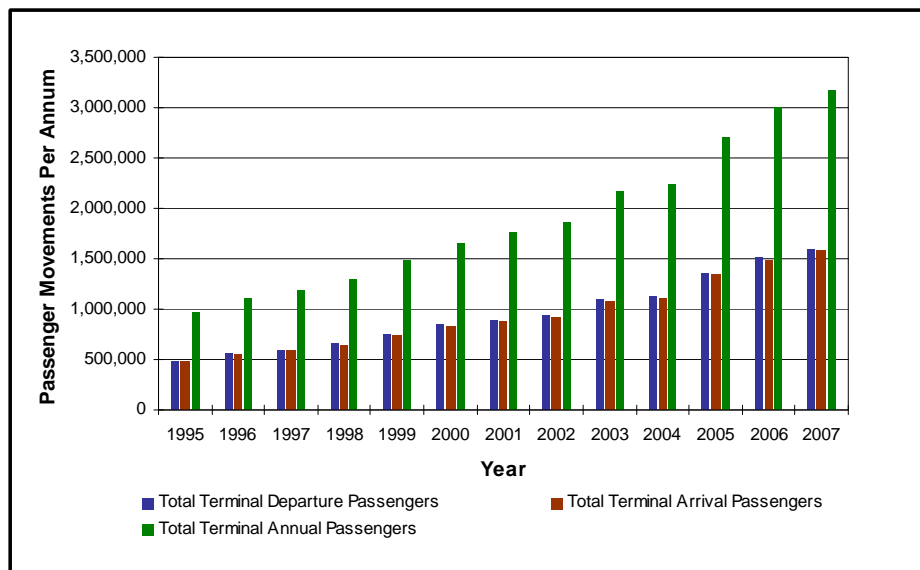
<sup>6</sup> Airports experience very large variations in demand levels with time, and these variations can be described in terms of: annual variation over time; monthly peaks within a particular year; daily peaks within a particular month or week; hourly peaks within a particular day. Different peaking characteristics can arise mainly due to geographical location and the nature of the catchment area/region, and also due to different passenger profiles. Generally, as the level of aircraft and passenger activity at an airport increases monthly and annually, the '*peaking profile*' will tend to flatten and the '*valleys*' between peaks will rise. This situation occurs as a result of the airport schedule becoming busier, with new aircraft operations having to take place in '*shoulder*' or '*off-peak*' periods due to capacity constraints during the '*typical peak*' or '*typical busy*' periods. The consequence of this is as an airport becomes busier and moves towards its operational capacity, it will achieve a greater utilisation of its infrastructure and facilities, and will, therefore, operate more efficiently and economically.

<sup>7</sup> Busy Hour Rate (BHR) is a primary method used by airports and aviation authorities to determine '*typical peak*' or '*typical busy*' aviation demand levels. The BHR is the hourly traffic rate (generally passenger traffic) at or below which 95% of the annual traffic can be handled at an airport without overcrowding areas and processes and, therefore, experience an acceptable '*level of service*'. The method of calculation of the BHR is to rank the recorded hourly flows in descending order and accumulate the total number of passengers involved until 5% of the annual total is reached. The BHR hour of occurrence will generally vary from year to year. This method is at present widely used by the British Airports Authority (BAA).



	Total Terminal Departure Passengers	Total Terminal Arrival Passengers	Total Terminal Annual Passengers	Annual Growth - Total Annual Passengers	Busiest Total Passenger Month	Ratio of Busiest Month to Annual Passengers	Busiest Total Passenger Day	Ratio of Busiest Day to Annual Passengers (10 <sup>x-2</sup> )
1995	484,214	478,585	962,799	-	120,530	0.125	5,641	0.586
1996	559,512	551,013	1,110,525	15.3%	146,010	0.131	6,848	0.617
1997	594,199	586,569	1,180,768	6.3%	147,057	0.125	7,432	0.629
1998	654,857	645,232	1,300,089	10.1%	156,635	0.120	6,874	0.529
1999	742,950	738,966	1,481,916	14.0%	175,188	0.118	8,180	0.552
2000	836,589	826,001	1,662,590	12.2%	194,283	0.117	9,289	0.559
2001	882,866	877,694	1,760,560	5.9%	210,302	0.119	10,152	0.577
2002	933,702	923,829	1,857,531	5.5%	216,620	0.117	10,435	0.562
2003	1,086,560	1,079,618	2,166,178	16.6%	265,239	0.122	13,050	0.602
2004	1,125,221	1,109,906	2,235,127	3.2%	244,120	0.109	12,331	0.552
2005	1,362,190	1,346,500	2,708,690	21.2%	300,062	0.111	13,869	0.512
2006	1,510,624	1,484,216	2,994,840	10.6%	319,797	0.107	14,731	0.492
2007	1,600,424	1,573,391	3,173,815	6.0%	334,562	0.105	14,108	0.445

Table 3.1 Analysis of Annual, Monthly and Daily Passenger Throughput for Cork Airport 1995 to 2007

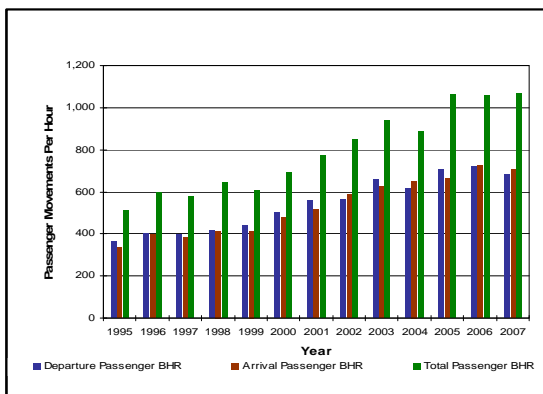


Graph 3.1 Annual Passenger Throughput for Cork Airport 1995 to 2007

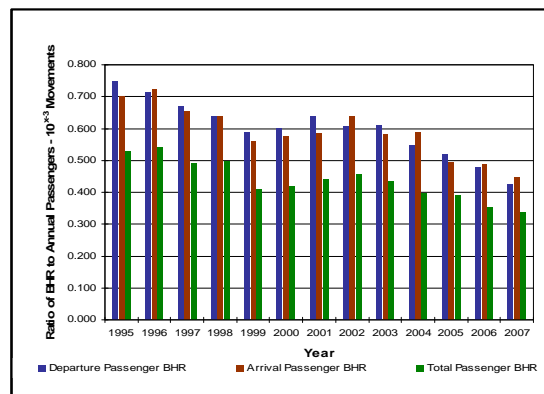


	Total Departure Passengers	Departure Passenger BHR	Ratio of BHR to Annual Departure Passengers (10 <sup>x-3</sup> )	Total Arrival Passengers	Arrival Passenger BHR	Ratio of BHR to Annual Arrival Passengers (10 <sup>x-3</sup> )	Total Passengers	Total Passenger BHR	Ratio of BHR to Annual Total Passengers (10 <sup>x-3</sup> )
1995	484,214	362	0.748	478,585	335	0.700	962,799	509	0.529
1996	559,512	400	0.715	551,013	399	0.724	1,110,525	600	0.540
1997	594,199	399	0.671	586,569	384	0.655	1,180,768	579	0.490
1998	654,857	420	0.641	645,232	413	0.640	1,300,089	645	0.496
1999	742,950	437	0.588	738,966	414	0.560	1,481,916	605	0.408
2000	836,589	503	0.601	826,001	476	0.576	1,662,590	696	0.419
2001	882,866	562	0.637	877,694	514	0.586	1,760,560	775	0.440
2002	933,702	566	0.606	923,829	590	0.639	1,857,531	847	0.456
2003	1,086,560	661	0.608	1,079,618	628	0.582	2,166,178	940	0.434
2004	1,125,221	614	0.546	1,109,906	653	0.588	2,235,127	887	0.397
2005	1,362,190	707	0.519	1,346,500	666	0.495	2,708,690	1,062	0.392
2006	1,510,624	720	0.477	1,484,216	723	0.487	2,994,840	1,059	0.354
2007	1,600,424	680	0.425	1,573,391	705	0.448	3,173,815	1,068	0.337

Table 3.2 Analysis of Departure, Arrival and Total 'Typical Busy' Hour Passenger Movements and Associated Ratios for Cork Airport 1995 to 2007



Graph 3.2 Departure, Arrival and Total 'Typical Busy' Hour Passenger Movements for Cork Airport 1995 to 2007



Graph 3.3 Departure, Arrival and Total 'Typical Busy' Hour Passenger Ratios for Cork Airport 1995 to 2007

To cater for the passenger growth it has been necessary to construct a new passenger terminal building which opened for operation in 2006 which is designed to cater for just over 3 million passengers per annum (mppa), and with approximately 3.2 million passengers passing through Cork Airport in 2007 the design capacity has been reached. Table 3.2 sets out the terminal passenger facilities and sizes for both 3 and 5 mppa, calculated by consultants to Cork Airport Authority responsible for the design and project management of the new passenger terminal building. In summary, total terminal areas of approximately 27,700m<sup>2</sup> and 37,900m<sup>2</sup> are required to cater for the design capacities of 3 and 5 mppa.



<b>Terminal Facilities</b>	<b>Total Areas for 3 MMPA</b>	<b>Total Areas for 5 MMPA</b>
<b>Areas/Processes</b>	<b>m<sup>2</sup></b>	<b>m<sup>2</sup></b>
Check-In and Ticketing	1,593	2,273
Friskem/Security	303	451
Premium Lounges	753	886
Retail/Catering	3,343	4,500
Departures Hall	3,910	5,986
Control Authorities	444	537
Sterile Arrivals Area	1,045	1,742
Baggage - Handling and Reclaim	5,430	7,342
Arrivals - Meeter/Greeter Area	1,953	2,994
Terminal Management, Support and Operations	3,914	4,401
Services and Circulation	5,045	6,782
<b>Total Terminal Area</b>	<b>27,733</b>	<b>37,894</b>

Table 3.3 Summary of Terminal Facilities and Associated Areas Required to Cater for 3 mppa and 5 mppa (Source: Jacobs/HOK Aviation, 2001)



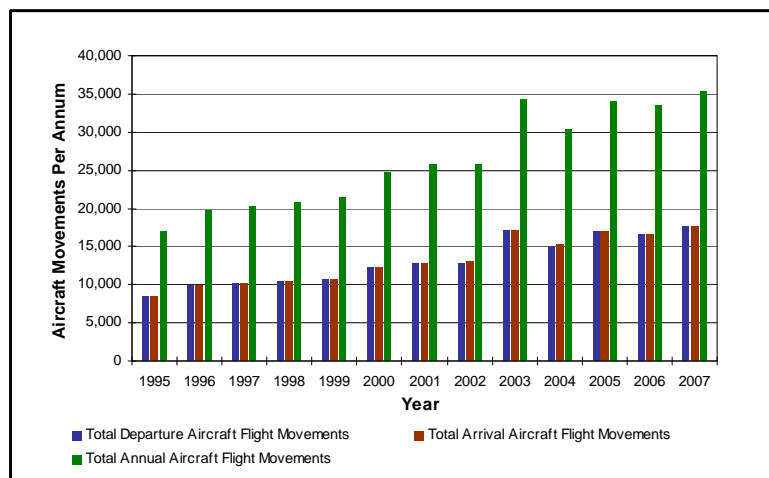
### Aircraft Movement Growth

Directly linked to the growth in passenger throughput at Cork Airport over the previous 13 years has been the increase in aircraft movements over this time period, with more than a doubling in movements from approximately 16,900 in 1995 to over 35,300 in 2007. This represents an annual increase of approximately 6.3%, with this growth displaying greater fluctuations than that of the passengers. Again, similar to passenger peaking analysis, the busiest total aircraft month and day have continued to grow from 1995 to 2007, however, the ratios of busiest month and busiest day to annual aircraft have decline reflecting the occurrence of peaking spreading.

Peak spreading of hourly aircraft movements at the airport has even more clearly occurred over the previous 13 years when the absolute 'peak' hour is analysed, with very significant reductions in the ratios of departure, arrival and total peak hour to annual aircraft movements<sup>8</sup>. This peaking analysis is illustrated in Table 3.5 and Graphs' 3.5 and 3.6.

	Total Departure Aircraft Flight Movements	Total Arrival Aircraft Flight Movements	Total Annual Aircraft Flight Movements	Annual Growth - Total Annual Aircraft	Busiest Total Aircraft Flight Movement Month	Ratio of Busiest Day to Annual Month	Busiest Total Aircraft Flight Movement Day	Ratio of Busiest Day to Annual Passengers (10 <sup>x-2</sup> )
1995	8,449	8,455	16,904	-	1,835	0.109	78	0.461
1996	9,843	9,838	19,681	16.4%	2,146	0.109	105	0.534
1997	10,172	10,166	20,338	3.3%	2,106	0.104	114	0.561
1998	10,391	10,398	20,789	2.2%	2,237	0.108	90	0.433
1999	10,738	10,743	21,481	3.3%	2,114	0.098	94	0.438
2000	12,353	12,361	24,714	15.1%	2,617	0.106	102	0.413
2001	12,851	12,875	25,726	4.1%	2,674	0.104	101	0.393
2002	12,873	12,927	25,800	0.3%	2,669	0.103	108	0.419
2003	17,111	17,168	34,279	32.9%	3,507	0.102	145	0.423
2004	15,147	15,176	30,323	-11.5%	2,844	0.094	117	0.386
2005	16,948	17,026	33,974	12.0%	3,459	0.102	141	0.415
2006	16,654	16,688	33,342	-1.9%	3,205	0.096	137	0.411
2007	17,635	17,714	35,349	6.0%	3,417	0.097	137	0.388

Table 3.4 Analysis of Annual, Monthly and Daily Aircraft Movements for Cork Airport 1995 to 2007



Graph 3.4 Annual Aircraft Movements for Cork Airport 1995 to 2007

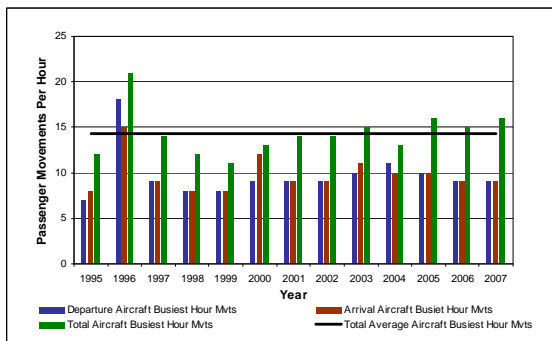
<sup>8</sup> It is necessary to base the analysis of hourly aircraft movements on the absolute peak hour as opposed to the typical busy hour due to the lower levels of hourly aircraft movements compared to hourly passenger movements and thus present a more representative assessment.



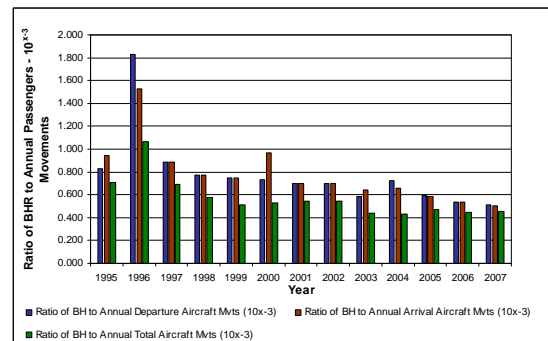


	Total Departure Aircraft Mvts	Departure Aircraft Busiest Hour Mvts	Ratio of BH to Annual Departure Aircraft Mvts (10 <sup>x-3</sup> )	Total Arrival Aircraft Mvts	Arrival Aircraft Busiest Hour Mvts	Ratio of BH to Annual Arrival Aircraft Mvts (10 <sup>x-3</sup> )	Total Arrival Aircraft Mvts	Total Aircraft Busiest Hour Mvts	Ratio of BH to Annual Total Aircraft Mvts (10 <sup>x-3</sup> )	Total Average Aircraft Busiest Hour Mvts
1995	8,449	7	0.829	8,455	8	0.946	16,904	12	0.710	14
1996	9,843	18	1.829	9,838	15	1.525	19,681	21	1.067	14
1997	10,172	9	0.885	10,166	9	0.885	20,338	14	0.688	14
1998	10,391	8	0.770	10,398	8	0.769	20,789	12	0.577	14
1999	10,738	8	0.745	10,743	8	0.745	21,481	11	0.512	14
2000	12,353	9	0.729	12,361	12	0.971	24,714	13	0.526	14
2001	12,851	9	0.700	12,875	9	0.699	25,726	14	0.544	14
2002	12,873	9	0.699	12,927	9	0.696	25,800	14	0.543	14
2003	17,111	10	0.584	17,168	11	0.641	34,279	15	0.438	14
2004	15,147	11	0.726	15,176	10	0.659	30,323	13	0.429	14
2005	16,948	10	0.590	17,026	10	0.587	33,974	16	0.471	14
2006	16,654	9	0.540	16,688	9	0.539	33,342	15	0.450	14
2007	17,635	9	0.510	17,714	9	0.508	35,349	16	0.453	14

Table 3.5 Analysis of Departure, Arrival and Total 'Peak' Hour Aircraft Movements and Associated Ratios for Cork Airport 1995 to 2007



Graph 3.5 Departure, Arrival and Total 'Peak' Hour Aircraft Movements for Cork Airport 1995 to 2007



Graph 3.6 Departure, Arrival and Total 'Peak' Hour Aircraft Ratios for Cork Airport 1995 to 2007

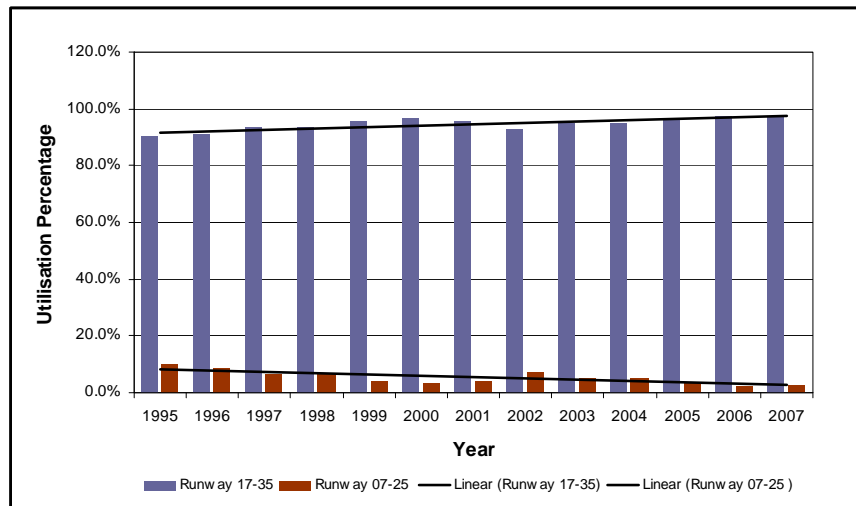


**Runway Utilisation**

With the different specification of the two cross runways at Cork Airport, namely, the north-south principal Runway 17-35 and the east-west secondary Runway 07-25, the aircraft utilisation rates of each with obviously vary. Table 3.6 and Graph 3.7 show the utilisation rates of the runways from 1995 to 2007. It is interesting to note that Runway 17-35 is the dominant runway for aircraft movements and the percentage split has changed over the 13-year period from 90/10 to 97/3. While the utilisation of Runway 07-25 is very low, it does provide necessary infrastructure to accommodate aircraft landing and take-off operations during particular weather conditions.

		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Runway 17-35	17	53.7%	53.9%	62.3%	52.3%	58.6%	56.7%	52.3%	54.7%	59.4%	48.8%	52.9%	62.0%	50.6%
	35	36.5%	37.2%	31.2%	41.1%	37.2%	40.0%	43.5%	38.1%	35.4%	46.2%	43.7%	35.5%	46.7%
	<b>Total</b>	<b>90.1%</b>	<b>91.1%</b>	<b>93.5%</b>	<b>93.4%</b>	<b>95.8%</b>	<b>96.6%</b>	<b>95.7%</b>	<b>92.8%</b>	<b>94.7%</b>	<b>95.0%</b>	<b>96.5%</b>	<b>97.5%</b>	<b>97.2%</b>
Runway 07-25	07	1.7%	2.1%	1.3%	0.6%	0.4%	0.3%	0.8%	1.1%	0.7%	0.4%	0.4%	0.3%	0.2%
	25	8.2%	6.7%	5.2%	6.1%	3.8%	3.0%	3.5%	6.1%	4.6%	4.5%	3.1%	2.2%	2.5%
	<b>Total</b>	<b>9.9%</b>	<b>8.9%</b>	<b>6.5%</b>	<b>6.6%</b>	<b>4.2%</b>	<b>3.4%</b>	<b>4.3%</b>	<b>7.2%</b>	<b>5.3%</b>	<b>5.0%</b>	<b>3.5%</b>	<b>2.5%</b>	<b>2.8%</b>
All R/Ws	<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Table 3.6 Runway Utilisation Analysis of Aircraft Movements on Runways' 17-35 and 07-25 for Cork Airport 1995 to 2007



Graph 3.7 Runway Utilisation Analysis of Aircraft Movements on Runways' 17-35 and 07-25 for Cork Airport 1995 to 2007



### Aircraft Parking Stand Utilisation

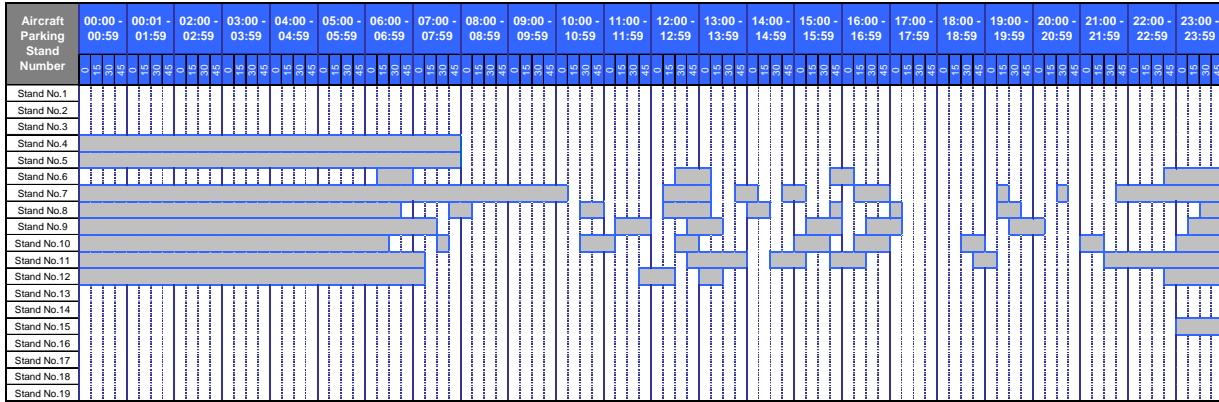
At present there are 19 aircraft parking stands at Cork Airport, of which 5 are in direct '*contact*' of the passenger terminal building with 14 being '*remote*'. Table 3.6 sets out the distinct characteristics of all of the current aircraft parking stands at the airport, including stand number, maximum aircraft wingspan and length that can be accommodated and associated aircraft code<sup>9</sup>, stand type and additional notes.

Aircraft Parking Stand Number	Maximum Aircraft Wingspan	Maximum Aircraft Length	Typical Aircraft Code	Aircraft Stand Type	Additional Notes
Stand No.1	22.8	27.0	Code B	Remote	Restricted/Broadside Aircraft Parking
Stand No.2	29.0	36.4	Code C	Remote	Restricted/Broadside Aircraft Parking
Stand No.3	29.0	36.4	Code C	Remote	Restricted/Broadside Aircraft Parking
Stand No.4	29.0	36.4	Code C	Remote	Restricted/Broadside Aircraft Parking
Stand No.5	34.1	44.6	Code C	Remote	Broadside Aircraft Parking
Stand No.6	35.8	44.6	Code C	Remote	Nose In Aircraft Parking
Stand No.7	38.1	54.6	Code C	Contact	Nose In Aircraft Parking
Stand No.8	38.1	54.6	Code C	Contact	Nose In Aircraft Parking
Stand No.9	38.1	54.6	Code C	Contact	Nose In Aircraft Parking
Stand No.10	38.1	54.6	Code C	Contact	Nose In Aircraft Parking
Stand No.11	38.1	54.6	Code C	Contact	Nose In Aircraft Parking
Stand No.12	36.0	44.6	Code C	Remote	Nose In Aircraft Parking
Stand No.13	36.0	44.6	Code C	Remote	Nose In Aircraft Parking
Stand No.14	38.1	47.4	Code C	Remote	Broadside Aircraft Parking, Stands' 13 and 15 not available for use
Stand No.15	34.4	37.6	Code C	Remote	Nose In Aircraft Parking
Stand No.16	36.0	46.7	Code C	Remote	Nose In Aircraft Parking
Stand No.17	47.6	55.0	Code D	Remote	Broadside Aircraft Parking, Stands' 16 , 18 and 19 not available for use
Stand No.18	47.6	55.0	Code D	Remote	Nose In Aircraft Parking
Stand No.19	65.0	70.7	Code E	Remote	Tow In/Push Back of Aircraft , Stands' 16, 17 and 18 not available for use

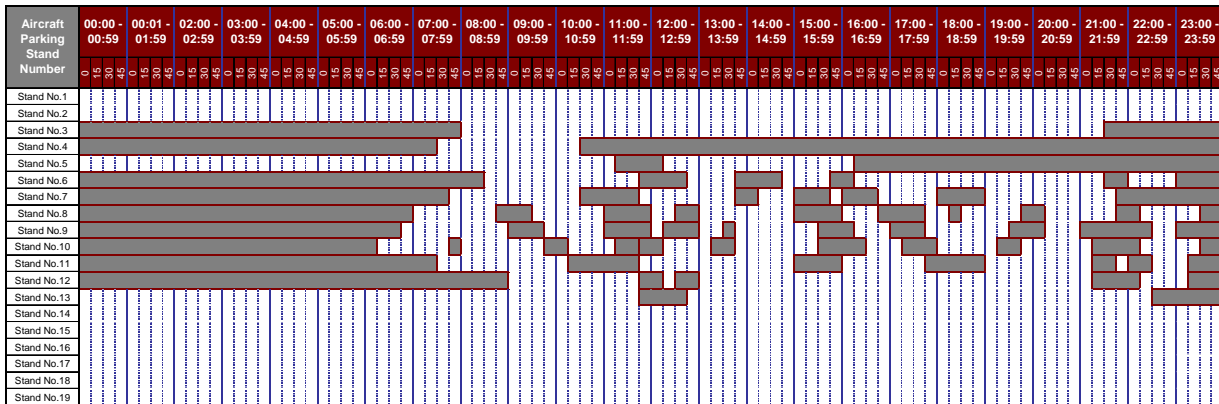
Table 3.6 Current Aircraft Stand Parking Characteristics for Cork Airport

In undertaking an analysis of the aircraft parking stand utilisation at Cork Airport a typical busy day aircraft flight schedule for both the winter and summer periods have been examined. The typical busy days selected are 24<sup>th</sup> February 2008 for the winter period and 19<sup>th</sup> July 2008 for the summer period. Graphs' 3.8 and 3.9 illustrate the utilisation analysis for the parking stands. The stands in operation for the typical busy winter day are Stands' 4 to 12 and 15 while for the typical busy summer day are Stands' 3 to 13. In terms of overall operational utilisation the typical busy summer day displays a higher rate of aircraft stand throughput than that of the typical busy winter day which is directly related to the general aircraft movements through the airport for these periods. For both aircraft flight schedules there is an evidently high level of overnight aircraft parking.

<sup>9</sup> The Aircraft Code is determined by reference to the ICAO classifications. Aircraft Code is the code letter, i.e. A to F, assigned by ICAO to aircraft based on the aircraft wingspan. The following are the ICAO Code Categories: Code A - aircraft wingspan up to but not including 15m, Code B - aircraft wingspan from 15m up to but not including 24m, Code C - aircraft wingspan from 24m up to but not including 36m, Code D - aircraft wingspan from 36m up to but not including 52m, Code E - aircraft wingspan from 52m up to but not including 65m and Code F - aircraft wingspan from 65m up.



Graph 3.7 Analysis of Aircraft Parking Stand Utilisation for Typical 2008 Busy Winter Day Flight Schedule (24/02/2008) for Cork Airport



Graph 3.8 Analysis of Aircraft Parking Stand Utilisation for Typical 2008 Busy Summer Day Flight Schedule (19/07/2008) for Cork Airport

### Cargo Tonnage Throughput Growth

The throughput of cargo tonnage at Cork Airport between 1995 and 2007 has fluctuated quite significantly, with the 2007 volume throughput being approximately 23% below that of 2006.

Year	Total Cargo - Tonnes	Annual % Growth in Cargo Tonnage
1995	1,807	-
1996	1,846	2.1%
1997	4,862	163.4%
1998	5,901	21.4%
1999	7,524	27.5%
2000	7,401	-1.6%
2001	7,465	0.9%
2002	7,305	-2.1%
2003	6,861	-6.1%
2004	7,152	4.2%
2005	7,047	-1.5%
2006	7,193	2.1%
2007	5,546	-22.9%

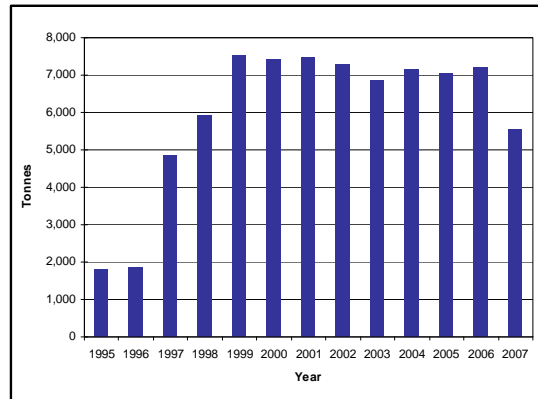


Table 3.7 Annual Cargo Throughput for Cork Airport 1995 to 2007

Graph 3.9 Annual Cargo Throughput for Cork Airport 1995 to 2007

### Car Parking Growth

The provision of car parking at Cork Airport has primarily three distinct categories, namely, short- and long-term passenger related parking, car hire parking and airport staff parking. In 2007, the provisions of short- and long-term car parking spaces were 632 (multi-storey) and 3,780 (surface), respectively, with a corresponding daily demand of 379 short-term and 3,667 long-term. Due to the characteristics of passenger related car parking demand it is necessary to ensure an over provision of the supply of spaces to the demand, with the ratio of demand to supply varying for both short-term and long-term. In terms of car hire facilities, the provision and demand for parking were both 220 spaces. The provision of staff car parking spaces in 2007 was 450 with the daily demand being 443.



### 3.3 Assessment of Future Growth

#### Passenger, Aircraft and Cargo Throughput Growth

The historic and forecast passenger, aircraft and cargo tonnage throughput for Cork Airport are set out in Table 3.8 and Graphs' 3.10 to 3.12, with the forecast time period being from 2008 to 2040<sup>10</sup>, with all experiencing a consistent level of growth. Annual passenger growth will be approximately 5% over the time period increasing from approximately 3.5 in 2008 to 15.9 by 2040. Similarly, the forecast growth in annual aircraft movements will be approximately 4.5%, growing from nearly 36,800 movements in 2008 to 152,500 by 2040. Cargo tonnage throughput is expected to equal an approximate annual growth rate of 2%, with the annual tonnage throughput increasing from almost 5,660 tonnes in 2008 to 10,660 tonnes in 2040.

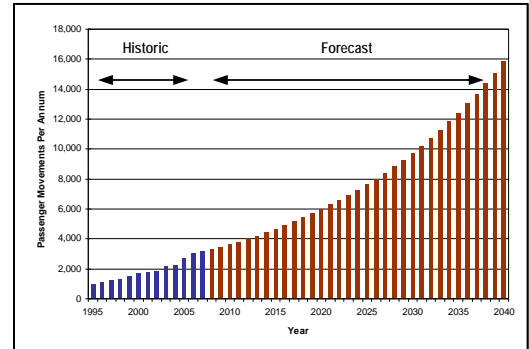
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<sup>10</sup> The forecast demand for passenger, aircraft and cargo tonnage are based on the most recent forecast data provided by Cork Airport Authority and have formed the basis of the futures needs assessment for the airport.

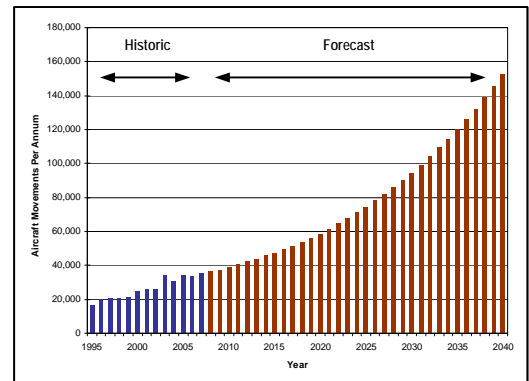


Year	Total Annual Pax ('000)	Annual Pax % Growth	Total Commercial Aircraft Mvmts	Annual Total Commercial Aircraft Mvmts % Growth	Total Cargo - Tonnes	Annual % Growth in Cargo Tonnage
1995	971	-	16,904	-	1,807	-
1996	1,124	15.8%	19,686	16.5%	1,846	2.1%
1997	1,196	6.4%	20,339	3.3%	4,862	163.4%
1998	1,315	9.9%	20,790	2.2%	5,901	21.4%
1999	1,502	14.2%	21,483	3.3%	7,524	27.5%
2000	1,680	11.9%	24,715	15.0%	7,401	-1.6%
2001	1,776	5.7%	25,727	4.1%	7,465	0.9%
2002	1,874	5.5%	25,807	0.3%	7,305	-2.1%
2003	2,182	16.4%	34,280	32.8%	6,861	-6.1%
2004	2,254	3.3%	30,323	-11.5%	7,152	4.2%
2005	2,730	21.1%	33,971	12.0%	7,047	-1.5%
2006	3,008	10.2%	33,341	-1.9%	7,193	2.1%
2007	3,180	5.7%	35,349	6.0%	5,546	-22.9%
2008	3,347	5.3%	36,756	4.0%	5,657	2.0%
2009	3,426	2.4%	37,233	1.3%	5,770	2.0%
2010	3,622	5.7%	38,909	4.5%	5,885	2.0%
2011	3,807	5.11%	40,426	3.9%	6,003	2.0%
2012	4,005	5.20%	42,043	4.0%	6,123	2.0%
2013	4,216	5.27%	43,767	4.1%	6,245	2.0%
2014	4,441	5.34%	45,562	4.1%	6,370	2.0%
2015	4,682	5.43%	47,475	4.2%	6,498	2.0%
2016	4,916	5.00%	49,327	3.9%	6,628	2.0%
2017	5,162	5.00%	51,251	3.9%	6,760	2.0%
2018	5,420	5.00%	53,249	3.9%	6,896	2.0%
2019	5,691	5.00%	55,859	4.9%	7,033	2.0%
2020	5,976	5.01%	58,596	4.9%	7,174	2.0%
2021	6,274	4.99%	61,467	4.9%	7,318	2.0%
2022	6,588	5.00%	64,479	4.9%	7,464	2.0%
2023	6,917	4.99%	67,638	4.9%	7,613	2.0%
2024	7,263	5.00%	70,952	4.9%	7,765	2.0%
2025	7,626	5.00%	74,429	4.9%	7,921	2.0%
2026	8,008	5.01%	78,076	4.9%	8,079	2.0%
2027	8,408	5.00%	81,902	4.9%	8,241	2.0%
2028	8,829	5.01%	85,915	4.9%	8,406	2.0%
2029	9,270	4.99%	90,125	4.9%	8,574	2.0%
2030	9,734	5.01%	94,541	4.9%	8,745	2.0%
2031	10,220	4.99%	99,174	4.9%	8,920	2.0%
2032	10,731	5.00%	104,033	4.9%	9,098	2.0%
2033	11,268	5.00%	109,131	4.9%	9,280	2.0%
2034	11,831	5.00%	114,478	4.9%	9,466	2.0%
2035	12,423	5.00%	120,088	4.9%	9,655	2.0%
2036	13,044	5.00%	125,972	4.9%	9,848	2.0%
2037	13,696	5.00%	132,144	4.9%	10,045	2.0%
2038	14,381	5.00%	138,619	4.9%	10,246	2.0%
2039	15,100	5.00%	145,412	4.9%	10,451	2.0%
2040	15,855	5.00%	152,537	4.9%	10,660	2.0%

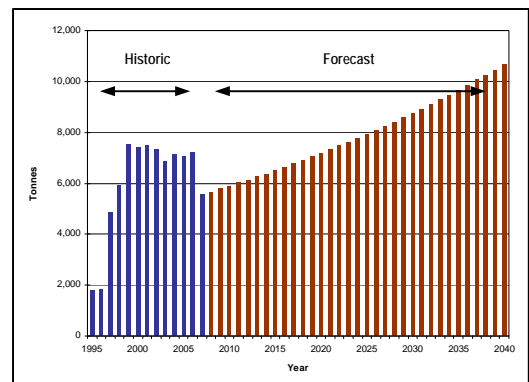
Table 3.8 Historic and Forecast Passenger, Aircraft Cargo Growth for Cork Airport 1995 to 2040



Graph 3.10 Historic and Forecast Passenger Growth for Cork Airport 1995 to 2040



Graph 3.11 Historic and Forecast Aircraft Growth for Cork Airport 1995 to 2040



Graph 3.12 Historic and Forecast Cargo Growth for Cork Airport 1995 to 2040

## Car Parking Growth

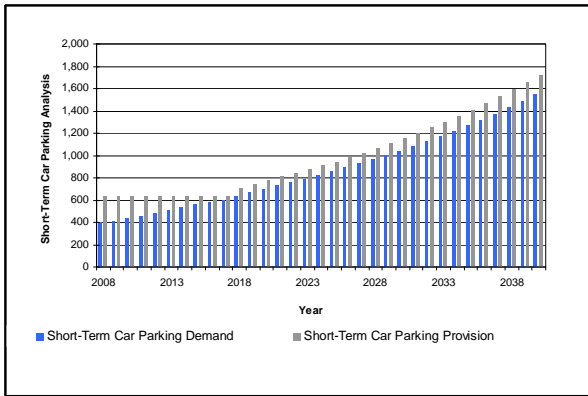
Table 3.9 and Graphs' 3.13 to 3.16 illustrated the forecast demand<sup>11</sup> and associated provision of short- and long-term parking, car hire parking and staff car parking for Cork Airport 2008 to 2040. In providing car parking spaces for the various types of requirements it is essential to achieve high levels of car parking utilisation rates, as set out in the table below in terms of the comparison between demand and provision, thus ensuring that excessive parking is not provided over the required forecast demand. It is noted that for short-term car parking provision particularly and also long-term car parking provision but less so, there will be greater fluctuations in the utilisation rates compared to that of car-hire and staff car parking provision based on the operational characteristics of the short- and long-term car parks.

Year	Total Annual Pax ('000)	Short-Term Car Parking Demand	Short-Term Car Parking Provision	Long-Term Car Parking Demand	Long-Term Car Parking Provision	Car Hire Parking Demand	Car Hire Parking Provision	Staff Car Parking Demand	Staff Car Parking Provision
2008	3,347	399	632	3,402	3,780	232	240	435	450
2009	3,426	409	632	3,584	3,982	237	240	425	450
2010	3,622	432	632	3,776	4,195	251	260	415	450
2011	3,807	454	632	3,978	4,420	264	270	400	450
2012	4,005	478	632	4,191	4,656	277	280	405	450
2013	4,216	503	632	4,357	4,842	292	300	416	462
2014	4,441	530	632	4,531	5,034	308	310	428	475
2015	4,682	559	632	4,712	5,235	324	325	440	488
2016	4,916	580	632	4,899	5,444	339	340	452	502
2017	5,162	600	632	5,094	5,660	356	360	464	516
2018	5,420	630	700	5,297	5,886	374	380	477	530
2019	5,691	666	740	5,508	6,120	393	400	490	545
2020	5,976	697	774	5,728	6,364	412	420	504	560
2021	6,274	725	806	5,994	6,660	433	440	528	586
2022	6,588	754	838	6,273	6,970	455	460	552	614
2023	6,917	785	872	6,564	7,294	477	480	578	642
2024	7,263	817	908	6,870	7,633	501	500	605	673
2025	7,626	850	945	7,189	7,988	526	525	634	704
2026	8,008	885	983	7,523	8,359	553	575	663	737
2027	8,408	921	1,023	7,873	8,748	580	600	695	772
2028	8,829	959	1,065	8,239	9,155	609	625	727	808
2029	9,270	998	1,109	8,622	9,580	640	650	761	846
2030	9,734	1,038	1,154	9,023	10,026	672	675	797	886
2031	10,220	1,081	1,201	9,443	10,492	705	725	834	927
2032	10,731	1,125	1,250	9,882	10,980	740	750	873	971
2033	11,268	1,170	1,300	10,341	11,490	777	800	914	1,016
2034	11,831	1,218	1,353	10,822	12,025	816	825	957	1,064
2035	12,423	1,268	1,408	11,326	12,584	857	875	1,002	1,114
2036	13,044	1,319	1,466	11,852	13,169	900	900	1,049	1,166
2037	13,696	1,373	1,526	12,403	13,781	945	950	1,098	1,220
2038	14,381	1,429	1,588	12,980	14,422	992	1,000	1,150	1,278
2039	15,100	1,487	1,652	13,584	15,093	1,042	1,050	1,204	1,338
2040	15,855	1,548	1,720	14,215	15,795	1,094	1,100	1,260	1,400

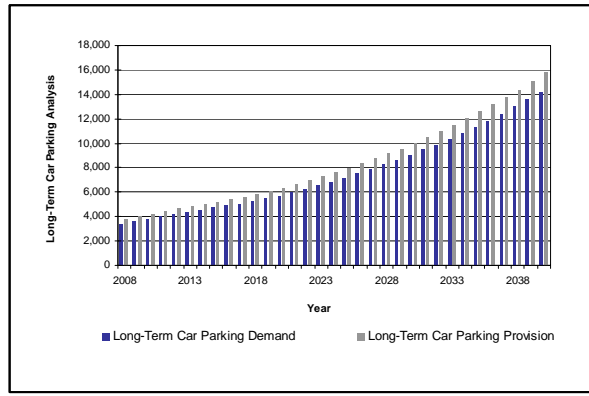
Table 3.9 Forecast Demand and Provision of Short- and Long-Term Parking, Car Hire Parking and Staff Car Parking for Cork Airport 2008 to 2040

<sup>11</sup> The forecast provisions for short- and long-term parking, car hire parking and staff car parking are based on the Cork Airport Transportation Study (2008) prepared by Faber Maunsell. Similar to the passenger, aircraft and cargo tonnage forecast, these forecasts have formed the basis of the futures needs assessment for the airport.

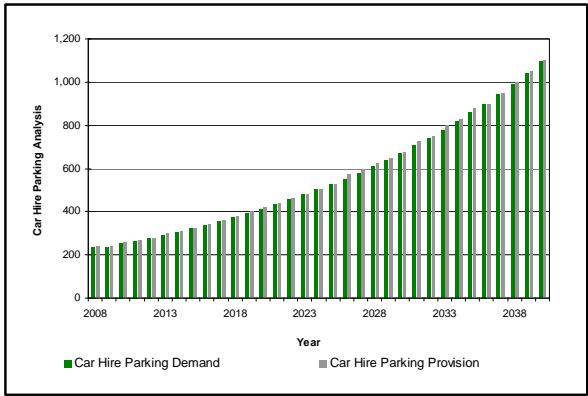




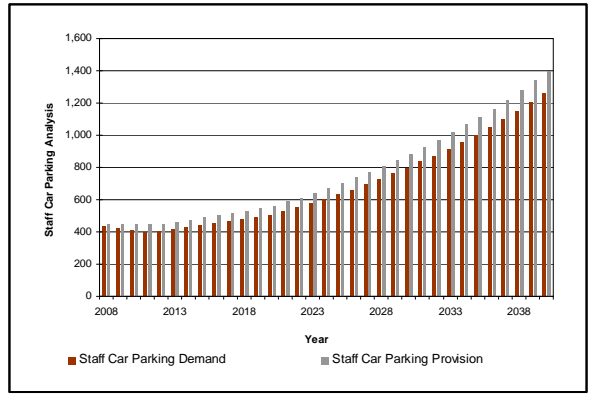
Graph 3.13 Forecast Demand and Provision of Short-Term Car Parking for Cork Airport 2008 to 2040



Graph 3.14 Forecast Demand and Provision of Long-Term Car Parking for Cork Airport 2008 to 2040



Graph 3.15 Forecast Demand and Provision of Car Hire Parking for Cork Airport 2008 to 2040



Graph 3.16 Forecast Demand and Provision of Staff Car Parking for Cork Airport 2008 to 2040

## 4.0 Strategic Phasing of Future Airport Needs

### 4.1 Introduction

It is essential to determine the various strategic future needs, particularly in terms of infrastructure and service requirements, for the short-, medium- and long-term growth and development of Cork Airport up to 2040. The future needs of Cork Airport for this 30+ year horizon are assessed in three phases, short-term 2008-2012, medium-term 2013-2020 and long-term 2021-2040. The future needs for each stage are assessed under the airside, landside and terminal component. Associated with each of these phases is forecast annual growth in passenger and commercial aircraft movements, together with annual cargo tonnage throughput increases. In addition, car parking demand and provision, for short-and long-term, car hire and staff are of significant importance. The following tables put forward a summary of the forecast growth for each of these specific elements.

	Year	Total Annual Pax ('000)	Annual Pax % Growth	Total Commercial Aircraft Mvmts	Annual Total Commercial Aircraft Mvmts % Growth	Total Cargo - Tonnes	Annual % Growth in Cargo Tonnage
Strategic Phase 1	2008	3,347	5.3%	36,756	4.0%	5,657	2.0%
	2012	4,005	5.20%	42,043	4.0%	6,123	2.0%
Strategic Phase 2	2013	4,216	5.27%	43,767	4.1%	6,245	2.0%
	2020	5,976	5.01%	58,596	4.9%	7,174	2.0%
Strategic Phase 3	2021	6,274	4.99%	61,467	4.9%	7,318	2.0%
	2040	15,855	5.00%	152,537	4.9%	10,660	2.0%

Table 4.1 Summary of Forecast Annual Passenger and Commercial Aircraft Movements and Annual Cargo Tonnage Throughput for Cork Airport 2008 to 2040

	Year	Total Annual Pax ('000)	Short-Term Car Parking Demand	Short-Term Car Parking Provision	Long-Term Car Parking Demand	Long-Term Car Parking Provision	Car Hire Parking Demand	Car Hire Parking Provision	Staff Car Parking Demand	Staff Car Parking Provision
Strategic Phase 1	2008	3,347	399	632	3,402	3,780	232	240	435	450
	2012	4,005	478	632	4,191	4,656	277	280	405	450
Strategic Phase 2	2013	4,216	503	632	4,357	4,842	292	300	416	462
	2020	5,976	697	774	5,728	6,364	412	420	504	560
Strategic Phase 3	2021	6,274	725	806	5,994	6,660	433	440	528	586
	2040	15,855	1,548	1,720	14,215	15,795	1,094	1,100	1,260	1,400

Table 4.2 Summary of Forecast Annual Car Parking Demand and Provision for Cork Airport 2008 to 2040

The given spatial configuration and layout of Cork Airport allows for the complex to be separated into four quadrants which are divided by the north-south Runway 17-35 and the east-west Runway 07-25. The four quadrants are termed as North East (NE), North West (NW), South East (SE) and South West (SW) Quadrants and are illustrated in Figure 4.1.

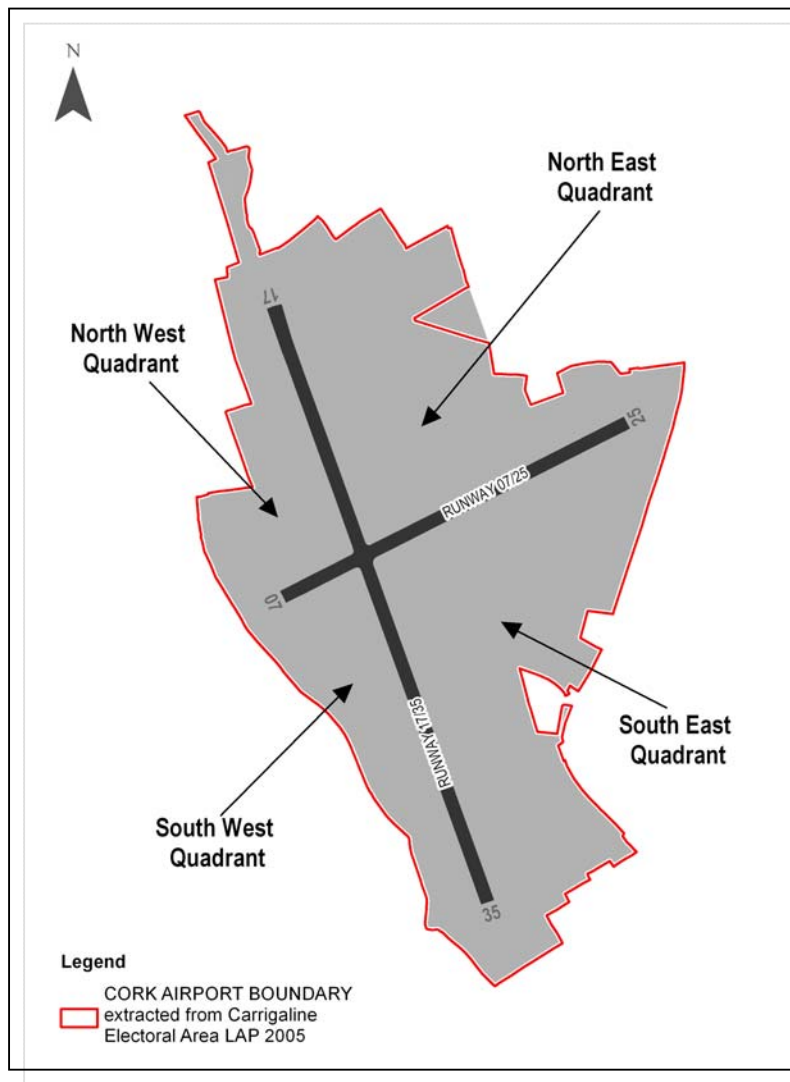


Figure 4.1 Schematic Layout of Cork Airport Complex illustrating the four Quadrant Areas

In addressing the strategic phasing of the future needs, the airport complex is separated into three distinct components, namely airside, terminal and landside. The following sets out a brief summary of the characteristics of the three airport complex components:

**Airside:** The main elements of the airside component are; runways (including taxiways) and aprons (including aircraft parking stands). Runways and their associated taxiways provide the physical infrastructure that allow aircraft to arrive and depart from the airport. A taxiway is a defined path within the airside component established for the taxiing of aircraft between runways and aircraft parking stands. Currently there are 2 single (cross) runways serving Cork Airport, namely, the north-south principal Runway 17–35 and the east-west secondary Runway 07–25. It has been estimated that the hourly capacity of a single runway in Visual Flight Rules (VFR)<sup>12</sup> is somewhere between 50 and 100 operations per hour, while in

<sup>12</sup> Visual Flight Rules (VFR) – these rules are in effect when visual meteorological conditions (VMC) prevail, i.e. when weather conditions are such that aircraft can maintain safe separation by visual means.



Instrument Flight Rules (IFR)<sup>13</sup> conditions this capacity is reduced to 50 to 70 operations per hour, depending on the composition of the aircraft mix, i.e. light, medium, heavy, the sequencing of arrivals and departures and the navigational aids available. In determining the future airside needs for Cork Airport it is strategically considered that the retention of the secondary Runway 07–25 is necessary to provide a necessary alternative to the principal Runway 17–35 to accommodate aircraft landing and take-off operations during particular weather conditions.

Aprons accommodate aircraft for the purposes of loading and unloading passengers, baggage, and cargo, and in addition for aircraft parking, refuelling, and/or maintenance. The apron provides the connection between the terminal building and the runway system. It includes aircraft parking areas, termed ramps, and aircraft circulation and taxiing areas for access to these ramps. On the ramp, aircraft park in areas designated as stands, which can be either terminal building/pier contact parking stands (commonly served by passenger loading bridges) or remote parking stands (served by passenger shuttle bus operation). Cork Airport currently has 19 operational aircraft parking stands, however only a maximum of 16 stands can be used at any one time. Of these stands only 5 are considered as being contact.

**Terminal:** The terminal component of an airport complex can be divided into passenger and cargo terminals. The airport passenger terminal is situated between the landside kerb set down/pick up area and the airside apron area. The terminal provides the linkage between the airside and landside components. The operational area of a terminal building is divided into a series of passenger facilities. A well designed and properly sized terminal building with a logical arrangement of the main processing functions and supported by proper signposting will allow for high capacity handling capabilities. The new terminal building at Cork Airport opened in 2006 with a design capacity of just over 3 mppa. In 2007 approximately 3.2 million passengers passed through Cork Airport.

Air cargo operations are generally separated from passenger terminals at airports, primarily to reduce the level of congestion on the landside road system. A cargo terminal is linked to the airside component via a dedicated apron area, and to the landside component via access roads. The vast percentage of the consolidation and handling of air cargo can be performed 'off airport'. The cargo operation is characterised more as a collection of warehouses each with their own activity controlled by a different operator. Currently, there are three separate cargo warehouses at Cork Airport located north of the new passenger terminal all of which are operated by three separate cargo handlers, namely, Aer Lingus, TNT and DHL.

**Landside:** The landside component of an airport complex provides a means of transferring passengers and cargo from the air mode form of transportation to the various land based modes of transportation. The landside facilities at Cork Airport consist of the following: access/egress road system, car parking for short-term, long-term, car-hire and staff, taxi rank, terminal forecourt and kerbside areas providing set down/pick up for private and rented car, taxi, bus, etc. A number of differing and distinct user groups are processed by the landside access/egress component of the airport system on a regular basis, with the principal groups being passengers and air cargo users, airport/airline employees working within the airport perimeter, visitors, passenger escorts and airport user suppliers. The landside passenger car parking at Cork Airport is made up of a short-term multi-storey car park providing approximately 632 spaces, a long-term surface car park providing approximately 3,780 spaces, and various car hire companies. In addition, two hotels, namely the Cork International Airport Hotel and the Radisson Airport Hotel, are located within the landside component.

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<sup>13</sup> Instrument Flight Rules (IFR) – these rules are in effect when instrument meteorological conditions (IMC) prevail, i.e. when the visibility or cloud ceiling (the height of the dominant cloud base) fall below that prescribed under visual meteorological conditions.

The following map illustrates the existing airport layout and configuration.

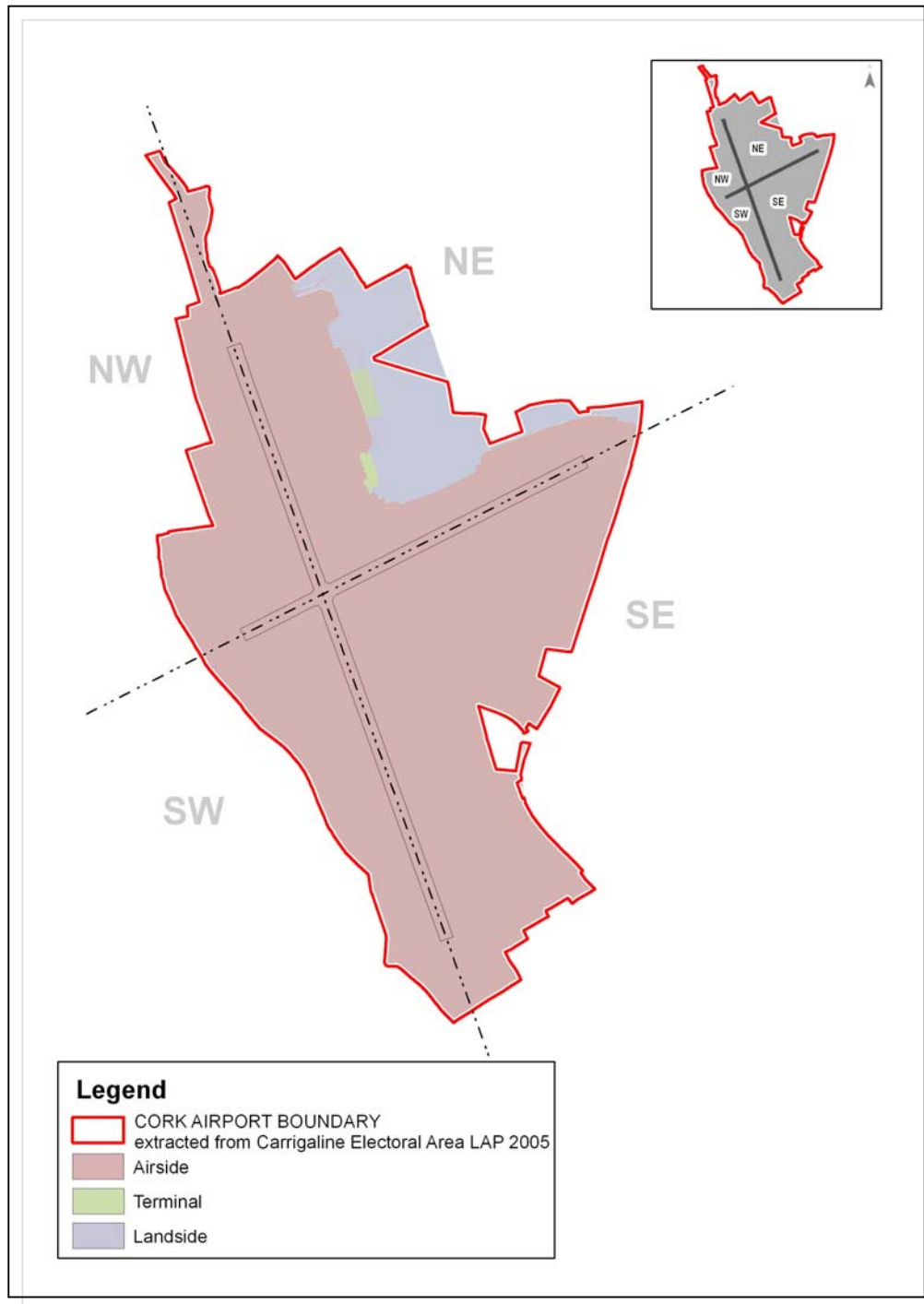


Figure 4.2 Schematic Layout of Existing Cork Airport Layout and Configuration



## 4.2 Strategic Phasing of Future Development

As stated previously, the future needs in terms of infrastructure and service provision of Cork Airport are separated into three separate strategic phases. The different phases will look at the short, medium and long term future needs for the airport. Each phase addresses the airside, terminal and landside requirements at the airport to allow for the continued growth and development of the airport:

- **Strategic Phase 1** concentrates on the necessary requirements needed to be put in place to allow the airport to continue to develop and grow in the short-term. The time period for Phase 1 is from 2008 to 2012. This time period will deal with an anticipated annual growth in passenger throughput from 3.4 million to 4.0 million and in commercial aircraft movements from just under 36,800 to approximately 42,000.
- **Strategic Phase 2** looks at what is necessary in the medium-term, 2013 to 2020, to continue to allow the airport to grow and develop in line with a forecast rise in passenger numbers from 4.2 million to 6.0 million processed through the airport per year, with a corresponding annual growth in commercial aircraft movements from just under 43,800 to approximately 58,600.
- Finally, **Strategic Phase 3** focuses on the long-term future needs for the airport from 2021 to 2040 which will allow the airport to cater for a forecast annual growth in passenger throughput from 6.3 million to 15.9 million and in commercial aircraft movements from almost 61,500 to just over 152,500.

The three strategic phases, and the associated infrastructure and service requirements for the airport, are directly related to forecast growth thresholds for passengers, aircraft movements, cargo tonnage and car parking demand.

### Strategic Phase 1 – 2008 to 2012

The following are the various requirements to allow for the future growth and development of Cork Airport within Phase 1 outlined under the three airport complex components.

#### Airside

To cater for the short-term forecast passenger and aircraft movement growth at Cork Airport there is an immediate requirement for additional aircraft parking stands. At present Cork Airport has 19 aircraft stands, with a maximum of 16 being operational at any one time based on the aircraft stand configuration and mix aircraft being accommodated. The short-term aircraft parking stand requirement will be for both contact and remote aircraft parking. The contact stand provision will be undertaken in conjunction with the required passenger terminal building extension that will be required during Strategic Phase 1 in the NE. The appropriate location for the remote stand provision is in the SE Quadrant which will require the provision of additional apron space. The exact number of required contact and remote aircraft parking stands will require a detailed aircraft stand capacity study to be undertaken by the airport authority. In line with the development of these remote aircraft parking stands there will be the need to provide a passenger transportation service between the passenger terminal and these remote stands. Therefore, a dedicated passenger bussing facility will need to be provided on the airside apron.

Allied to the development of remote aircraft parking space in the SE Quadrant is the extension of the parallel taxiway for Runway 17-35 from the NE Quadrant into the SE Quadrant so as to provide a full length parallel taxiway for this Runway. The development of this parallel taxiway is needed to cater for the continued growth of commercial aircraft movements at the airport for short-, medium- and long-term. Through the provision of this parallel taxiway the current aircraft taxiing time using Runway 17-35 would significantly reduced thus increasing the Runway's operational capacity. To enable the development of the extended parallel taxiway in the SE Quadrant it will be necessary to relocate the existing private flying school facility from the SE Quadrant to the SW Quadrant.

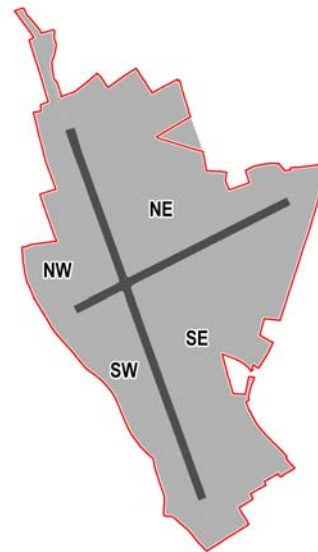
Detailed consideration will need to be given within this phase for the need to provide an extension to the existing north-south Runway 17-35 so as to facilitate in the long-term the commencement and operation of long-haul and transatlantic flights which will enhance the airport's competitive position. The extension of the east-west Runway 07-35 is impractical primarily because, firstly, the cost implications makes it prohibitive, secondly, extending Runway 07-35 in an easterly direction will require realignment of the Kinsale Road (R600) which will have serious implications on the primary access to the airport and related safety issues, and thirdly, it would be contrary to the established strategy of the airport authority which is for development on the north-south axis as set out in the Cork Airport Development Plan 1999 and the Cork Airport SE Quadrant Study (Scott Wilson 2006). Therefore, as the extension of Runway 17-35 is the best possible option, it will be necessary for the airport authority to undertake immediately a feasibility study to determine the most suitable direction of the extension, i.e., in a southerly direction, a northerly direction or a combination of both, so as to achieve an extended runway with a length ranging from 2,350m to 2,633m. As a consequence of the Runway 17-35 extension there will be the need to redefine the associated runway obstacle limitation surfaces, aviation safety Red Zones, Public Safety Zones (PSZs) and noise contours of Runway 17-35 which will require the undertaking of detailed assessment and modelling studies.

The relocation of the general aviation aircraft base from the SE Quadrant to the SW Quadrant will also be necessary to provide both the required additional apron space and the parallel taxiway.

In addition, the development of an aircraft maintenance facility through the provision of a common-user aircraft hangar for day-to-day aircraft maintenance in the SE Quadrant is seen as a necessary requirement in the short-term. The development of this common-user hangar facility may have the potential for airline operators to increase and/or develop an operational presence at the airport.

#### Summary of Airside Needs – 2008 to 2012:

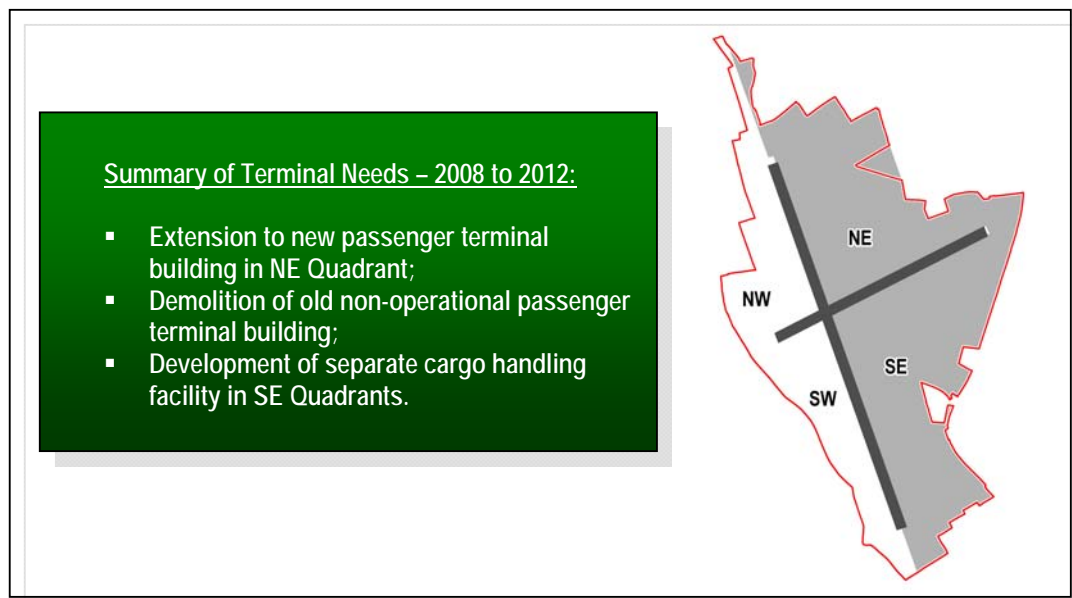
- Development of contact aircraft parking stands and associated apron in NE Quadrant;
- Development of remote aircraft parking stands and associated apron in SE Quadrant;
- Provision of a dedicated passenger bussing facility;
- Development of extension of parallel taxiway to Runway 17-35 into SE Quadrant;
- Undertaking of a feasibility study for the extension to Runway 17-35;
- Relocation of private flying school and general aviation aircraft base including all ancillaries from SE to SW Quadrant;
- Development of aircraft maintenance facility through the provision of a common-user aircraft hangar in SE Quadrant.



## Terminal

The new terminal building which opened in August of 2006 has a design capacity to cater for 3+ mppa. A total of 3.2 million passengers passed through the passenger terminal in 2007. With the occurrence of peak-period spreading of hourly throughput the passenger terminal will be able to accommodate up to 4-million passengers per annum without a reduction in service standards. To accommodate forecast passenger growth there will be a need to commence the development of an extension to the new terminal building in 2011/2012 for operational use in 2013. It is anticipated that the extended passenger terminal will be able to cater for 5 to 6 million passengers per annum. The terminal building extension will take place in both a north and south direction within the NE Quadrant, thus increasing the size of the new passenger terminal building block and enabling the provision of additional contact aircraft parking stands.

To allow for this terminal extension a number of enabling works will be required. Firstly, resulting from the future needs analysis and on the need to strategically provide aviation-related infrastructure in a logical and sequential spatial approach while ensuring high quality design and functionality, it will be necessary to demolish the old passenger terminal building thus allowing for the southerly expansion of the new passenger terminal. Secondly, the existing cargo warehouse facilities positioned to the north of the new passenger terminal building will require relocation to the SE Quadrant with the development of a new cargo handling facility and associated requirements.



## Landside

With the projected growth in annual passenger throughput at the airport, and the associated increase in private car demand, there is the need to develop additional car parking for long-term passenger parking and car hire. There are 3,780 long-term passenger car parking spaces currently available and it is anticipated that an additional 876 spaces will be required in the short-term to cater for demand and the most sequential area to increase the long-term car parking is to the north of the existing facility. This will require the acquisition of additional land outside the current airport boundary. Car hire parking provision requires an increase in the order of 60 spaces. These additional car hire parking spaces can be provided within the NE Quadrant. There is adequate short-term and staff car parking provisions to facilitate for the projected growth in this time period.



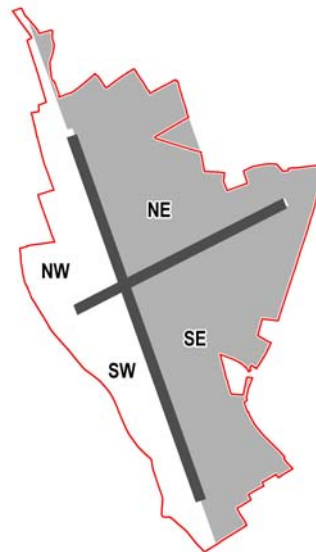
The centralisation of car hire facilities and services is an immediate need to free up space in the direct vicinity of the new passenger terminal building which will significantly reduce a large volume of car hire traffic.

To enable the access to both the proposed new aircraft maintenance facility and new cargo handling facility there will be a need to provide a secure access point to the SE Quadrant from the Kinsale Road (R600).

An immediate requirement is for the development of an integrated public transport system to serve the airport. At present Bus Eireann provide a frequent bus service from the airport to the main city bus terminus at Parnell Place. The opportunity exists to extend this service from Parnell Place to the city railway station, Kent Station, thus linking air, rail and bus services. This would improve accessibility to and from the airport and provide an alternative to private car use for both airport passengers and employees. Regional accessibility to the airport will be improved with the completion of the Cork to Dublin inter-urban motorway.

#### Summary of Landside Needs – 2008 to 2012:

- Provision of additional long-term car parking spaces;
- Acquisition of additional land to the north of NE quadrant for long-term car parking needs;
- Provision of additional car hire parking spaces in NE Quadrant;
- Centralisation of car hire activities in NE Quadrant;
- Provision of a secure access point to SE Quadrant;
- Provision of an integrated public transport system.



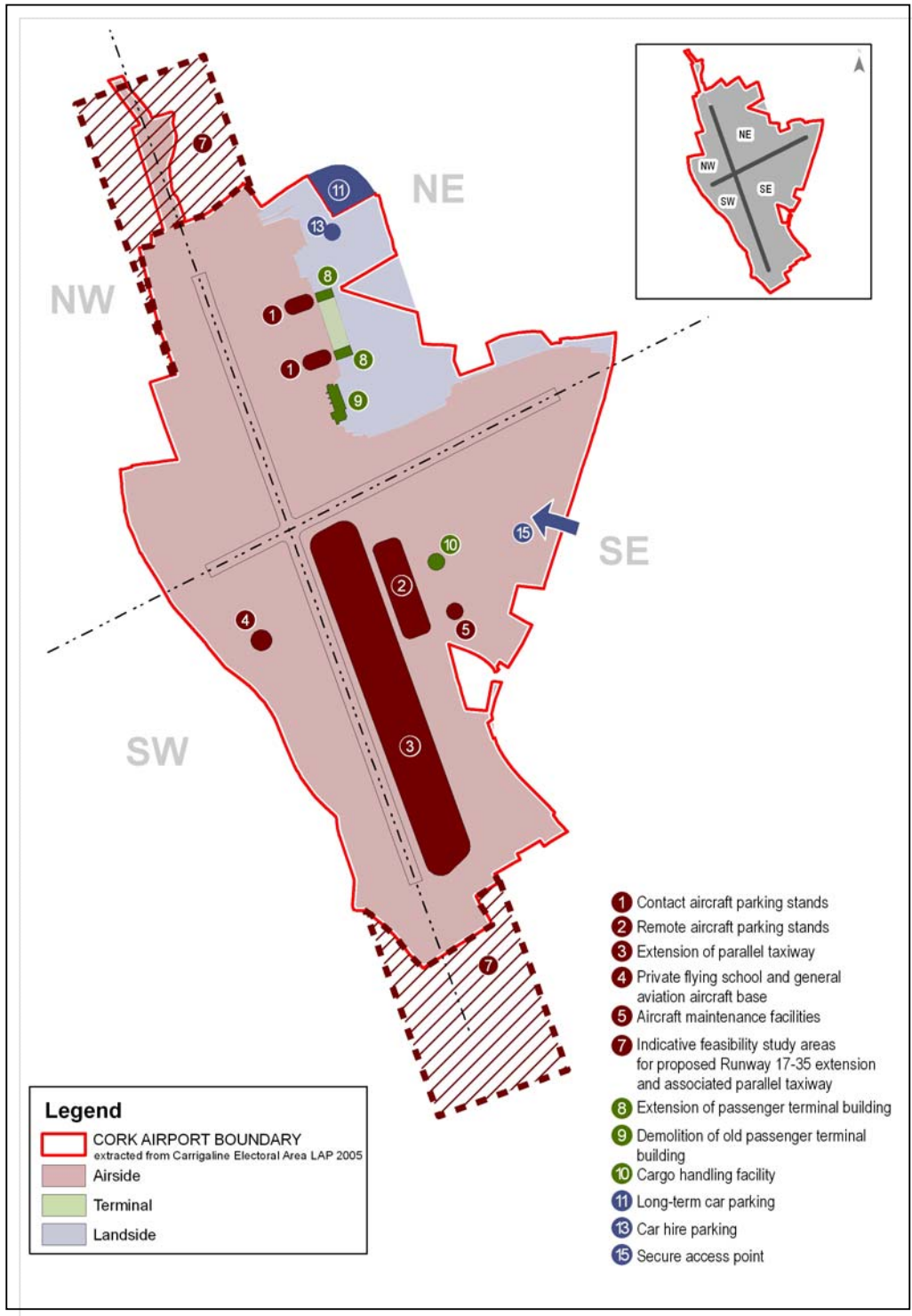


Figure 4.3 Schematic Layout of Future Needs of Cork Airport based on Strategic Phase 1 – 2008 to 2012

## Strategic Phase 2 – 2013 to 2020

The various requirements to allow for the future growth and development of the airport within this phase are outlined under the three airport components.

### Airside

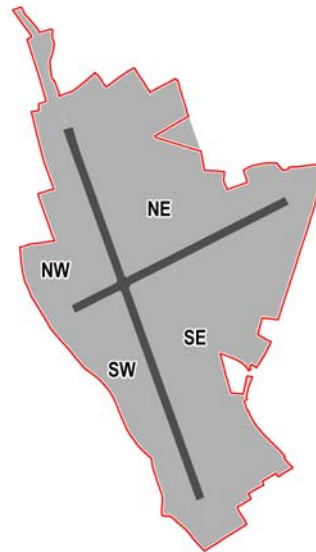
To cater for forecast passenger and commercial aircraft movement growth between 2013 and 2020 there will be the requirement for additional aircraft parking stands, both contact and remote, the exact number to be determined by the airport authority. Similar to Phase 1, the contact stand provision within the NE Quadrant will be undertaken in conjunction with the required passenger terminal building extension to be undertaken during Strategic Phase 2. Following on from Phase 1 it will be necessary to develop further remote aircraft parking stands in the SE Quadrant.

As previously discussed, the required extension to Runway 17-35, the most suitable direction of which being determined by the feasibility study, will be undertaken and become operational within this strategic phase thus enabling the accommodation of long-haul and transatlantic flights.

To allow for future growth and development it will be necessary to relocate the existing fire station from the NE Quadrant to the NW Quadrant thus freeing up additional apron space and to allow for the future expansion of the passenger terminal building. In addition, there will be a need to further develop both general aviation and aircraft maintenance facilities.

### Summary of Airside Needs – 2013 to 2020:

- Development of contact aircraft parking stands and associated apron in NE Quadrant;
- Development of remote aircraft parking stands and associated apron in SE Quadrant;
- Extension of Runway 17- 35;
- Relocation of Fire Station from NE to NW Quadrant;
- Further development of general aviation facilities in SW Quadrant;
- Further development of maintenance facilities in SE Quadrant.



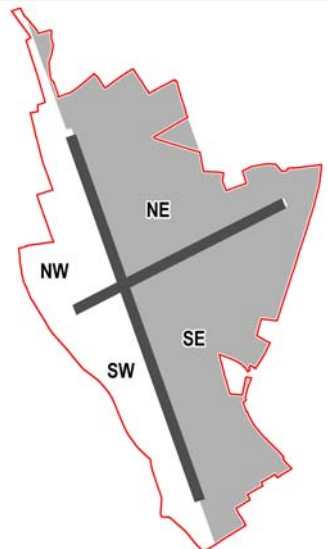
## Terminal

The forecast growth in annual passenger throughput of 6.0 million by 2020 will necessitate a further extension to the new passenger terminal building to cater for future increase in annual passenger movements. It will be necessary to commence the construction of this extension in 2018/19 for operation in 2020. The terminal building extension will take place in both a north and south direction, thus increasing the size of the new previously extended passenger terminal building block and also enabling the provision of additional contact aircraft parking stands.

During this time period it may become necessary to further extend the new cargo handling facility located in the SE Quadrant to cater for forecast increase in cargo tonnage throughput.

Summary of Terminal Needs – 2013 to 2020:

- Extension to new extended passenger terminal building in NE Quadrant;
- Further development of cargo handling facility in SE Quadrant.



## Landside

Annual forecast passenger throughput growth together with the increase in private car demand will require the further development of additional car parking for short- and long-term passenger parking, car hire and staff. The additional car parking space requirements both short- and long-term will be 142 spaces and 1,708 spaces, respectively. It will be a requirement to provide for additional car hire and staff car parking spaces in the order of 140 spaces and 110 spaces, respectively. Similar to Phase 1, the additional long-term car parking will require acquisition of further additional land outside the current airport boundary. The additional short-term, car hire and staff car parking spaces can all be accommodated within the NE Quadrant.

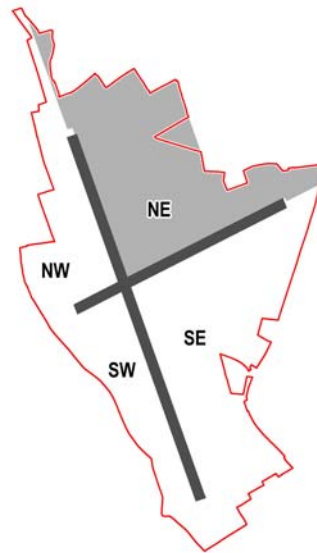
Accessibility to the airport will need to be further improved during this phase with the increase in landside surface traffic through the airport. A complimentary secondary access to the airport would relieve pressure somewhat on the existing entrance that may experience an increase in congestion levels resulting from increased forecast landside movement activity and provide an alternative to this entrance. This could serve as a secondary access for employees and services mainly, but could also provide an alternative access/egress for the airport in an emergency situation. The most appropriate location of the secondary access is through the NE Quadrant.

Swift journey times and reliability will be ensured by the introduction of priority traffic measures at the Kinsale Road Roundabout and the South City Link Road. Regional accessibility will be improved with the completion of the Rosslare to Killarney cross route as outlined in the Atlantic Gateways Initiative and the Regional Planning Guidelines.

During this phase of strategic development will be necessary to ensure development of a rapid public transit corridor, i.e. green route, linking the airport to the city centre, as set out in the CASP Update. The implementation of dedicated bus services between the city and the airport should be developed. Therefore, improvements to the existing public and private bus services will be required along with additional kerbside set-down/pick-up spaces.

#### Summary of Landside Needs – 2013 to 2020

- Additional short- and long-term car parking spaces in NE Quadrant;
- Acquisition of additional land to the north of NE quadrant for long-term car parking needs;
- Additional car hire parking spaces in NE Quadrant;
- Additional staff car parking spaces in NE Quadrant;
- Provision of secondary complimentary access through NE Quadrant;
- Improve accessibility;
- Improvements to existing bus services.



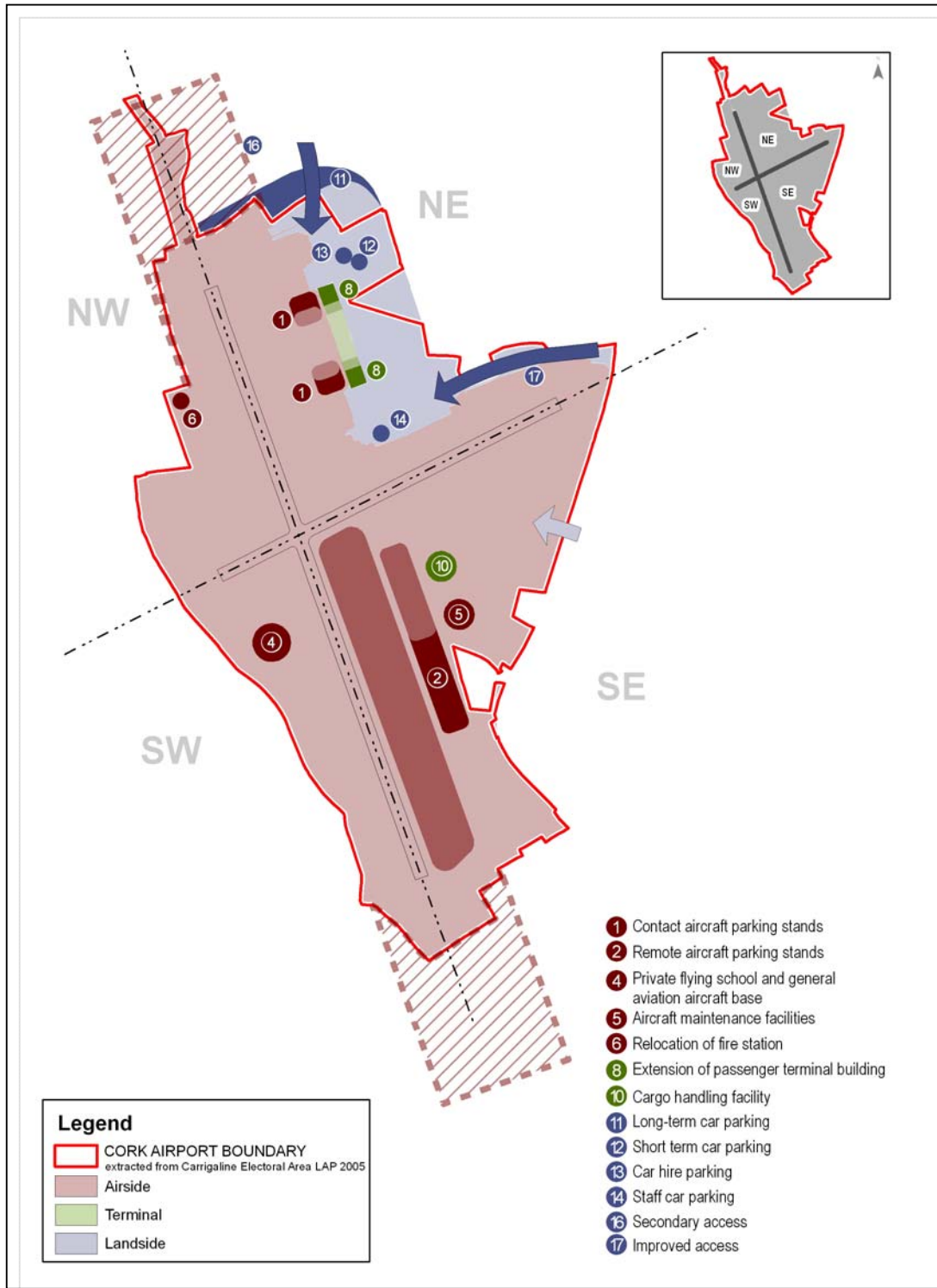


Figure 4.4 Schematic Layout of Future Needs of Cork Airport based on Strategic Phase 2 – 2013 to 2020

### Strategic Phase 3 – 2021 to 2040

The following are the various requirements to allow for the future growth and development of Cork Airport for Phase 3 outlined under the three airport complex components.

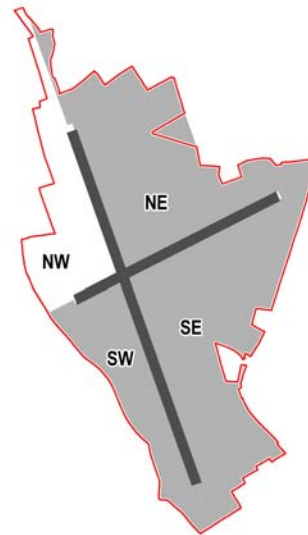
#### Airside

This phase will require the continued development of both contact and remote aircraft parking stands in the NE and SE Quadrants, respectively, again the exact number to be determined by the airport authority. The provision of additional contact stands will again be undertaken in conjunction with the continued passenger terminal building extension to be undertaken during Strategic Phase 3.

In addition, further development of general aviation and aircraft maintenance facilities in the SW and SE Quadrants, respectively, will be required.

#### Summary of Airside Needs – 2021 to 2040:

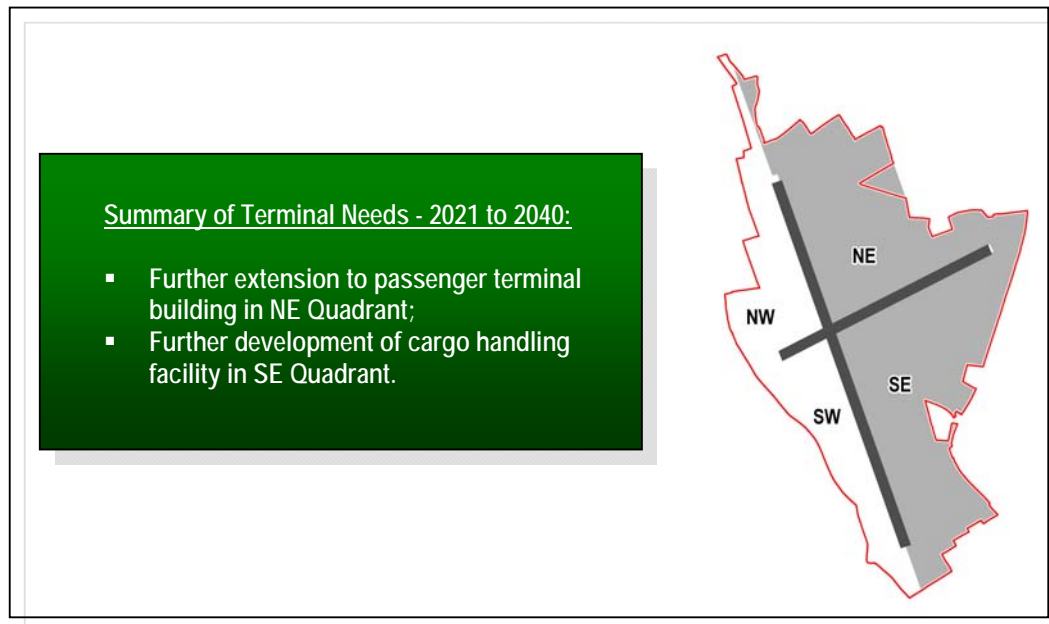
- Development of contact aircraft parking stands and associated apron in NE Quadrant;
- Development of remote aircraft parking stands and associated apron in SE Quadrant;
- Further development of general aviation facilities in SW Quadrant;
- Further development of aircraft maintenance facilities in SE Quadrant.



## Terminal

The previously extended passenger terminal building will need to be further extended during this phase to accommodate the projected increase in annual passenger throughput of approximately 16million up to 2040. As with the previous terminal building extensions the proposed extension within this phase will take place in both a north and south direction, thus increasing the size of the previously extended passenger terminal building block and also enabling the provision of additional contact aircraft parking stands.

It may also be necessary to again further extend the new cargo handling facility located in the SE Quadrant to cater for forecast increase in cargo tonnage throughput.



## Landside

With the continued forecast passenger throughput growth and associated increase in private car demand there will be the further need to develop additional car parking for short- and long-term passenger parking, car hire and staff. The additional car parking space requirements both short- and long-term will be 946 spaces and 9,431 spaces, respectively. Additional car hire and staff car parking spaces will be required in the order of 680 spaces and 840 spaces, respectively. Similar to Phases' 1 and 2, the additional long-term car parking will require acquisition of further additional land outside the current airport boundary. The short-term, car hire and staff car parking spaces can all be accommodated within the NE Quadrant.

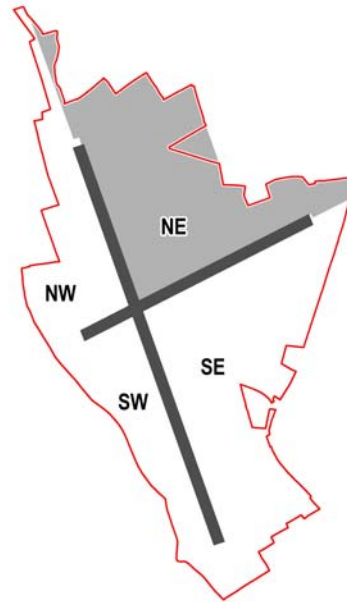
Accessibility to the airport will need to be further improved following on from Phases' 1 and 2.

It is considered that national and regional transport infrastructure will be continually developed during this Phase which will further improve the accessibility of the airport. The further development of public transportation during this Phase should provide an adequate alternative to private car use with an efficient and integrated public transport system serving the airport, city, bus and rail stations.



Summary of Landside Needs - 2021 to 2040:

- Provision of additional short- and long-term car parking spaces in NE Quadrant;
- Acquisition of additional land to the north of NE quadrant for long-term car parking needs;
- Provision of additional car hire parking spaces in NE Quadrant;
- Provision of additional staff car parking spaces NE Quadrant;
- Improve road infrastructure;
- Improve accessibility;
- On-going development of an integrated public transport system between the airport and city.



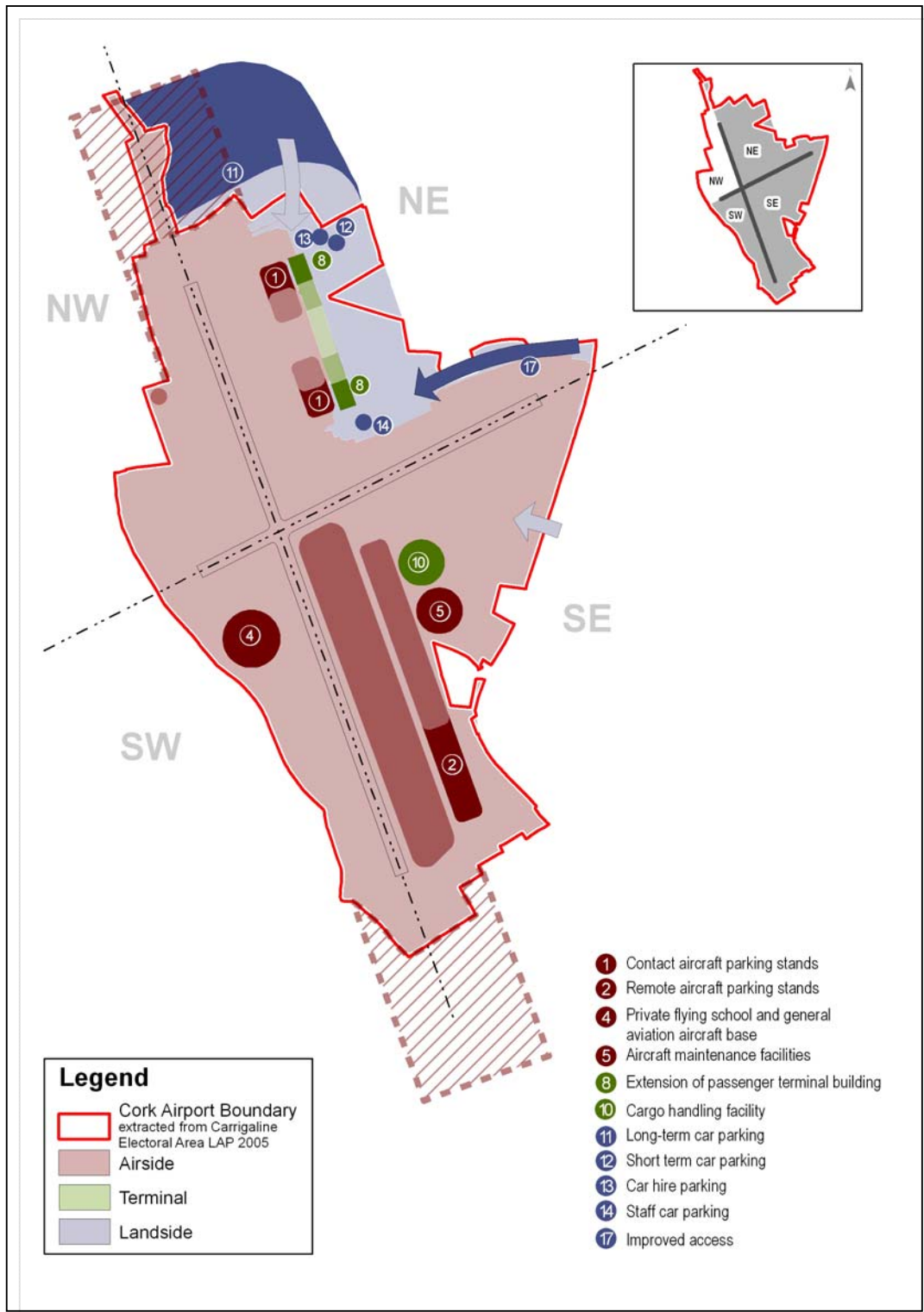


Figure 4.5 Schematic Layout of Future Needs of Cork Airport based on Strategic Phase 3 – 2021 to 2040



### 4.3 Summary

Over the next 30+ years passenger and commercial aircraft movements, together with cargo tonnage, are forecast to grow significantly at Cork Airport. In particular, between 2007 and 2040, annual passenger throughput will increase from 3.2m to 15.9m representing almost a 500% growth rate, with annual total commercial aircraft movements increasing from over 35,300 to over 152,500 equating to a growth rate of nearly 432%. It is essential that the strategic future needs of the airport associated with the forecast growth are fully catered for in terms of infrastructure and service requirements, for the short-, medium- and long-term growth and development of Cork Airport up to 2040. The future needs of Cork Airport for this 30+ year horizon can be separated into three phases, namely, short-term 2008-2012, medium-term 2013-2020 and long-term 2021-2040.

To provide for the future needs of Cork Airport up to 2040 in order to cater for the forecast growth a number of principal infrastructure and service provisions have been identified and can be summarised as follows, and illustrated in Figure 4.6:

#### Summary of principal infrastructure and service provisions – 2008 to 2040:

##### Airside

- Development of contact and remote aircraft parking stands and associated apron;
- Provision of a dedicated passenger bussing facility;
- Development of an extension of parallel taxiway to Runway 17-35;
- Relocation and development of private flying school and general aviation including associated ancillaries;
- Development aircraft maintenance facilities;
- Relocation of fire station;
- Undertaking of a feasibility study for the extension to Runway 17-35.

##### Terminal

- Continuous extension to new passenger terminal building;
- Demolition of the old non-operational passenger terminal building;
- Development of a separate cargo handling facility.

##### Landside

- Provision of additional short- and long-term, car hire and staff car parking spaces;
- Acquisition of additional land for long-term car parking needs;
- Provision of a secure access point to SE Quadrant;
- Provision of an integrated public transport system;
- Provision of secondary complimentary access;
- Improve accessibility.

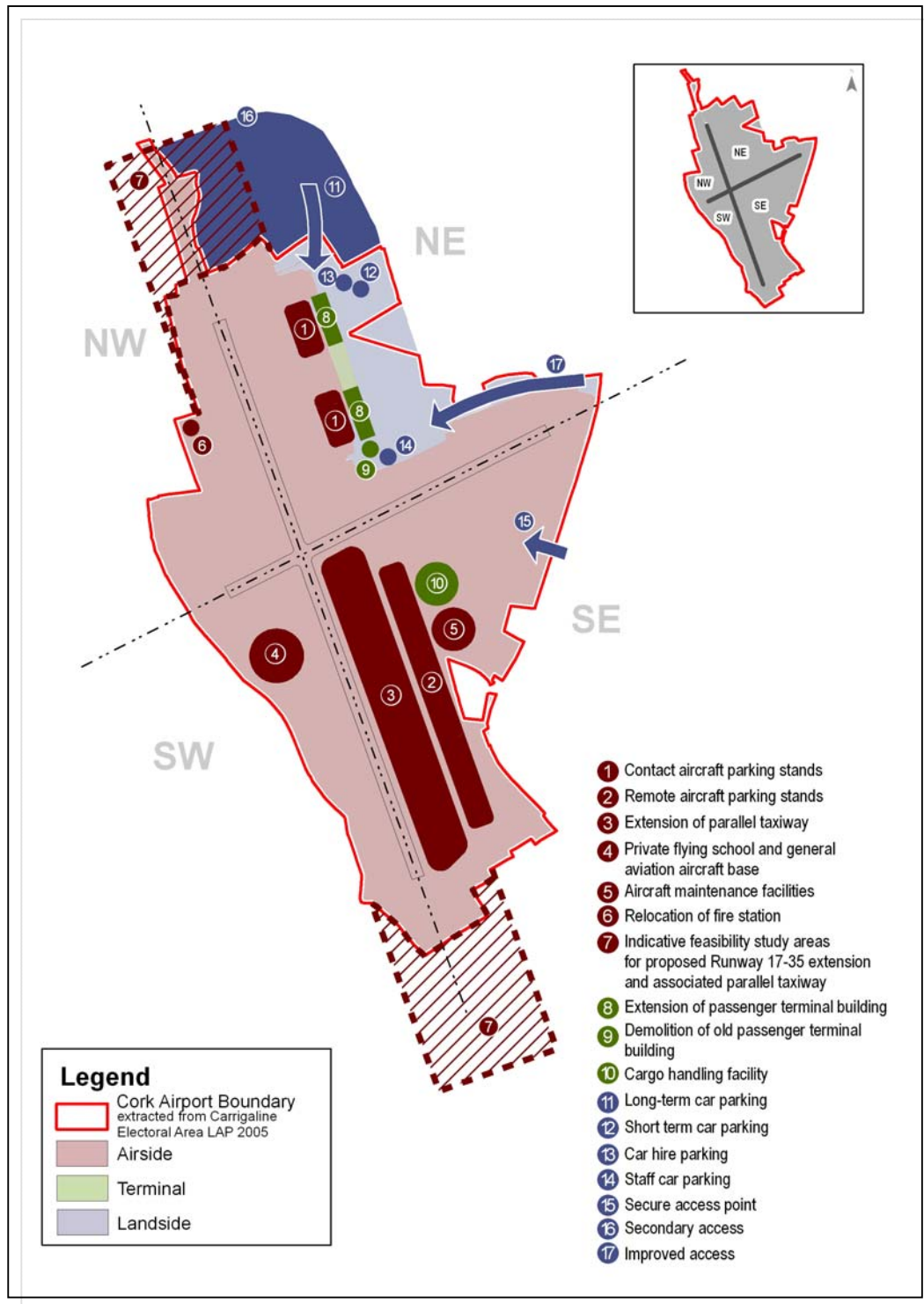


Figure 4.6 Schematic Layout of Overall Future Needs of Cork Airport - 2008 to 2040



## 5.0 Environmental and Safety Related Issues

### 5.1 Introduction

An essential element of the future needs study for Cork Airport is the relevant environmental and public safety issues which need consideration with regard to the future growth and development of the airport. In considering these issues it is important to make references and draw recommendations from various published studies on Cork Airport. These include the Land Use Masterplan Study (Scott Wilson 1996), the Cork Airport Development Plan 1999, the Environmental Impact Assessment of the Terminal Development (Environmental Impact Services Limited 2001), the Environmental Assessment of the Intensification of Airside Operations at Cork Airport (Environmental Impact Services Ltd 2007) and the ERM Report on Public Safety Zones for Cork, Dublin and Shannon Airports (Environmental Resources Management Ireland Ltd 2005). Public safety and noise zones need to be assessed and continually monitored with the continued required expansion of the airside, landside and terminal components of the airport.

### 5.2 Future Development and Associated Environmental Issues

Section 4 sets out the required future needs of Cork Airport from 2008-2040 to allow for its future growth and development. As and when required each infrastructure project will be fully planned and designed setting out the specific project details. Each infrastructure project will be subject to the normal statutory consent procedures, thus these projects will be submitted to the Local Authority as planning applications for consideration. The Local Authority will assess each application on its own merits and through the development control process will ensure that adequate mitigation measures and continued environmental assessment are put in place when required.

The environmental constraints on the development of Cork Airport were examined as part of the Land Use Masterplan Study (Scott Wilson 1996) and further analysis was carried out in the Environmental Impact Assessment of the Terminal Development (Environmental Impact Services Limited 2001). The latest environmental assessment was published in September 2007 on the intensification of airside operations at the airport (Environmental Impact Services Limited 2007).

The key issues from these reports and those which would need further analysis and assessment in accordance with any future infrastructure development are summarised below:

<b>Human Beings</b>	Positive socio-economic impacts are likely to be the principal effect of the future developments and expansion of Cork Airport. The increase in passenger numbers and aircraft movements will result in new jobs in order to facilitate aircraft movements, provide services to passengers and construct required developments. The increase in passengers will result in increased local, regional and national income for the Airport Authority, for service providers at the Airport and for service providers in the wider area around Cork Airport.
<b>Ecology</b>	There are no designated sites of geological or ecological interest within or close to the airport boundary. Ecological assessment will need to be carried out with the development of lands in the SE, SW and NW Quadrants as these lands are largely undeveloped at present.
<b>Heritage</b>	There are no sites within the boundary of the airport complex listed in the current Cork County Development Plan 2003-2009 as <i>“structures or features of Historic, Archaeological, Architectural or Artistic Importance listed by the Commissioner of Public Works”</i> or as <i>“Items and Structures of Historic, Archaeological, Architectural</i>



*or Artistic Importance for protection other than those protected by the Office of Public Works (OPW) or Vested in the County Council".*

There are nine archaeological sites close to the airport but it is unlikely that potential expansion would be to the detriment of any of these with the exception of site No 37, a Souterrain and Ringfort. It is located in very close proximity to the airport's south west boundary. The remainder of the sites are all in excess of 1,200m distance from the Airport.

Further cultural and heritage assessment will need to be carried out in line with any future development at the airport.

## Aircraft Noise

Cork Airport is sited on a high elevated location a mainly rural area adjacent to Cork City.

The future growth of aviation related activity and associated development of the various Quadrants within the airport boundary has the potential to change the ground noise regime. Cargo and maintenance activities often contribute to night-time noise owing to the specific requirements of those operations and are therefore especially sensitive and significant. The future development of these facilities would need to factor in these constraints.

The noise environment and contours around the airport are likely to change as a result of future growth and development. Increased operations, changes in aircraft type and mix, changes in the associated operations such as maintenance and construction activity during implementation of developments will all contribute to increased noise.

The 2001 Environmental Impact Statement (EIS) by Environmental Impact Services Ltd identified the surrounding population of the airport stating that the *"... site has a number of dwellings along the property boundary to the south-east of the terminal areas. The Kinsale Road, to the north-east is the next nearest concentration and there is also a small cluster on elevated land to the immediate east of the entrance roundabout. Otherwise there are low densities of scattered houses"*. The EIS identified that the Kinsale Road and the airport itself are long established noise sources however the EIS did not require the assessment of airside operations including assessment of noise emitted from aircraft movements.

It is estimated that intensification of airside operations will result in an increase in commercial aircraft movements from over 35,300 in 2007 to over 152,500 in 2040. The impacts of the resulting noise emissions should be examined in any Environmental Assessment, taking into account the surrounding population and mitigation measures such as new noise minimising technology being developed within newer aircraft.

## Air Quality

As with noise, the specific developments of the various Quadrants could give rise to localised issues of air quality from particular sorts of operations. Potential air quality impacts as a result of the intensification in airside operations will result from aircraft emissions during the landing and take-off (LTO) cycle.

The air quality aspect of the airside operations at Cork Airport have been assessed through a combination of a review of measured data, and modeling of the dispersion of aircraft engine emissions. The existing air quality in the Cork area is considered to be within current air quality standards, based on published EPA data. An air quality survey commissioned by Cork Airport in 2006 also determined that concentrations of common pollutants in the vicinity of the Airport were within air quality standards. Apart from carbon monoxide, the survey detected no statistically



significant correlation between real-time measured combustion pollutants and aircraft movements. This indicates that the air quality impact of the current airport operations was not directly detectable in the ambient background pollutant concentrations. Pollutant emissions from aircraft engines were calculated based on aircraft movement data for 2006, and standard emissions factors published by the ICAO. The dispersion of pollutants from the Airport was modeled using a standard computer dispersion model (the standard US EPA regulatory dispersion model, AERMOD, was used to calculate the concentration of pollutants in a 4 x 3km receptor grid centered on the Airport – Environmental Assessment of Airside Operations at Cork Airport 2007).

The predictions of the dispersion model indicate that there is negligible impact in terms of existing concentrations of sulphur dioxide, carbon monoxide, benzene, or particulate matter concentrations in the vicinity of the Airport. The model also indicated that mean nitrogen dioxide concentrations are likely to be comfortably within the annual limit value at all residential locations.

An analysis of potential emissions of volatile organic compounds from jet engines, and modeling of its dispersion, determined that existing concentrations are likely to be within the environmental guideline assessment level at all residential locations.

The overall conclusion from the latest environmental assessment is that the air quality at residential locations in the vicinity of Cork Airport is comfortably within current air quality standards, and that future intensification of operations is unlikely to have a significant impact. With increased airside operations and future developments at the airport (including development of a parallel taxiway and extension to Runway 17-35) there may be a change in the mix and pattern of aircraft handled within the airport for the existing runways. Such change could affect the LTO-cycle operation at the Airport, with a consequent change in the rate of aircraft emissions. However, the most likely scenario for the evolution of future air quality is that the effect of the increased aircraft movements will be offset by reductions in jet engine pollutant emissions. This would mean that air quality will remain essentially unchanged in the locality.

#### Landscape

Intervening topography, vegetation and existing buildings will almost entirely screen any views of new buildings in the NE Quadrant from north, east or south of the airport. The further development of facilities such as extensions to existing buildings and the construction of new buildings such as maintenance and cargo facilities would require further Landscape Visual Impact Assessment. Preparation of comprehensive landscape design proposals for screening and use of excess soils, etc., will be needed with any new proposed developments.

#### Water

Due to the airport's elevated location all surface water at present ultimately dissipates to either the Tramore or Owenboy river catchments. The precedent has been established that increases in paved areas will need to be attenuated to prevent down-stream flooding and any future developments will need to incorporate appropriate attenuation measures.

There is currently limited control of potential contaminants to the watercourses. Such contaminants include de-icing agents deliberately applied to pavements and aircraft in order to ensure the safety of airport operations as well as fuel and other spillages.

In view of increasingly tight legislation and further requirements of discharge consents to watercourses, it would be prudent to include space within any future land use plans for the development of facilities to provide protection of the watercourses from contaminants.



The amount of semi-natural surfaces to be replaced by artificial, more impervious surfaces as a result of future infrastructure developments which will be required by the increase in airport passenger and aircraft growth should be assessed in order to determine whether such replacements will have a significant effect on the flow of water into local water bodies. Existing attenuation tanks are located in the SE Quadrant and it is essential that these be retained and extended accordingly to accommodate any increase of paved areas resulting from the long-term development of the site. In addition, preventative measures will need to be adopted to prevent contaminated water from aircraft operations entering local watercourses.

## Climate

Ireland has already reached the growth limitation target of 13% applied by the Kyoto Protocol but has nonetheless set an even more ambitious target for itself of reducing greenhouse gas emissions by over 20% over the next ten years.

The Intergovernmental Panel on Climate Change (IPCC) published a report in 1999 on aviation and the global atmosphere in terms of overall impact of aircraft emissions and climate change. This report estimated that aircraft emissions of CO<sub>2</sub> accounted for about 2.4% of total CO<sub>2</sub> emissions from burning fossil fuels in 1992, or 2% of the annual total from anthropogenic emissions. By 2050 it is projected that the total contribution from aircraft emissions would increase to approximately 3% of the total. The global aviation industry is currently formulating strategies aimed at limiting greenhouse gas emissions. Recent international strategies with regard to aircraft and climate change policies, such as improvements in aircraft engine design and higher fuel efficiency, will also contribute to lower greenhouse gas emissions at the airport over the next 30+ years.

Increases in emissions as a result of the intensification of airside operations and future developments at the airport will need to be calculated. This addition is likely to have an imperceptible impact on total atmospheric emissions in the Cork Airport area, and on greenhouse gases from all sources including road traffic. The contribution of aircraft emissions from the activities at an airport are likely to be insignificant on a national basis, compared to other emissions of greenhouse gases from road transport and anthropogenic emissions.

## Material Assets

The future forecast increase in passenger and aircraft movements together with the intensification of airside activity will require the development of extensions to the passenger terminal building, additional aircraft parking stands, runway extension, parallel taxiway as well as the construction of facilities to accommodate essential services such as aircraft maintenance, fire tenders, refuelling tanks, etc. Together with this will be the growth in cargo and cargo facilities, and also the need for additional landside requirements such as passenger car parking, car hire and staff parking facilities.

### Traffic

A traffic assessment was carried out as part of the 2001 EIS. It provided a comprehensive statutory assessment of traffic impacts due to the construction of the new passenger terminal facility. Continued traffic assessment will be required as part of any increased development at the airport. This traffic assessment will form part of any future proposed development at the airport which may require an associated EIS.

Also, studies will also be necessary regarding the proposed future development of an integrated public transportation system between Cork Airport, Cork City and the region. Further transportation assessment will be required to look specifically at access and egress at the airport and the road infrastructure serving the airport.





Faber Maunsell's 'Cork Airport Transportation Study' (2008), prepared on behalf of Cork County Council, which outlines a strategy for future development of transport links to the airport provides an essential reference point.

#### Waste, Waste Water, Water Supply and Electricity Requirements

The intensification of flights and the possibility of an increase in larger planes both of which will lead to an increased number of passengers are likely to lead to increased amount of waste generated on both the airside and the landside of the Airport.

Airside waste handling procedures will continue to be in accordance with best practice and all solid wastes will be disposed of to approved facilities and handled by appropriately licensed contractors.

The intensification and future development of operations at the airport is not likely to increase demand for airside electricity to a point where it would be likely to have significant impact on the local supply network.

The intensification of aircraft movements to cater for the forecast increase in passenger throughput will result in increased volumes of waste and waste water and of water supply and energy requirements throughout the airport's complex. These increases will need continuous evaluation into the future as part of continued environmental assessment or forming a part of any EIA carried within the airport complex.

The conclusions of previous environmental reviews of the airport site have been that provided good practice is followed in the planning, design and implementation of projects, there would appear to be no wide-ranging environmental constraints on development, although there may be localised impacts on the residential properties that would need to be mitigated against. Continued monitoring and environmental assessment will be required at the airport to ensure that mitigation measures are being implemented correctly.

### 5.3 Public Safety Areas

Public safety areas in the vicinity of the airport are addressed by two separate zoning standards. The first of these are Obstacle Clear Surfaces which were drawn up by the (then) Department of Transport and aim to, firstly, provide an obstacle clear surface to aid safe navigation of aircraft, and secondly, protect people on the ground. The second are Public Safety Zones (PSZs) which were proposed in a 2005 report commissioned by the Department of Transport and the Department of the Environment, Heritage and Local Government. This report considered safety hazard to people on the ground due to the operation of the three State airports, Cork, Dublin and Shannon. This report stated that *"advances in modelling techniques have made it possible to quantify the risks to the public (on the ground) from aircraft crashes. These techniques have shown that the risk pattern 'on the ground' bears little relation to the extent and shape of the red zones. Therefore, a set of protection zones, termed Public Safety Zones (PSZs), have been recommended for Cork, Dublin and Shannon airports. When adopted, these PSZs will help protect the public, whilst the red zones will continue to aid safe navigation of aircraft"*. The PSZs report presents a very detailed and up-to-date assessment of the risks to the public due to aircraft crashes.

The following puts forward a summary of the consequences of these two zoning standards.

#### **Zoning Standards: Obstacle Clear Surfaces**

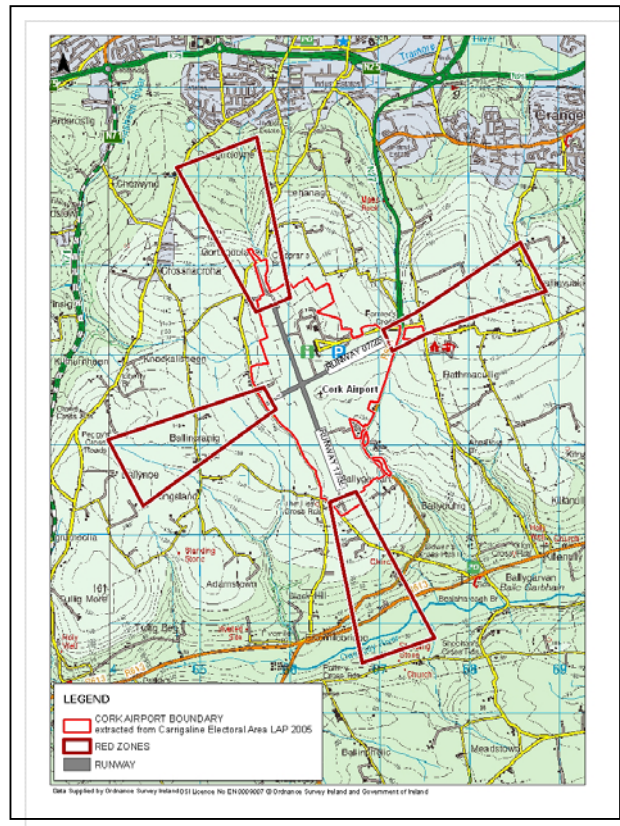
##### Background

In 1979 the (then) Department of Transport and Power designated areas in the vicinity of Cork Airport to be subject to building restrictions for the purposes of, as

previously stated, providing obstacle clear surfaces to aid safe navigation of aircraft and protecting people on the ground.

These surfaces, or zones, are divided into separated category types, and different restrictions apply in each different category of zone, (as outlined below). Planning applications in the vicinity of these zones are referred to the IAA by Cork County Council's Planning Department to seek their observations as part of the statutory planning process under Section 28 of the Planning and Development Regulations, 2001. In preparing observations the IAA will, among other considerations, have regard to the proposed development's height and proximity to these zones. The following is a summary of these zones:

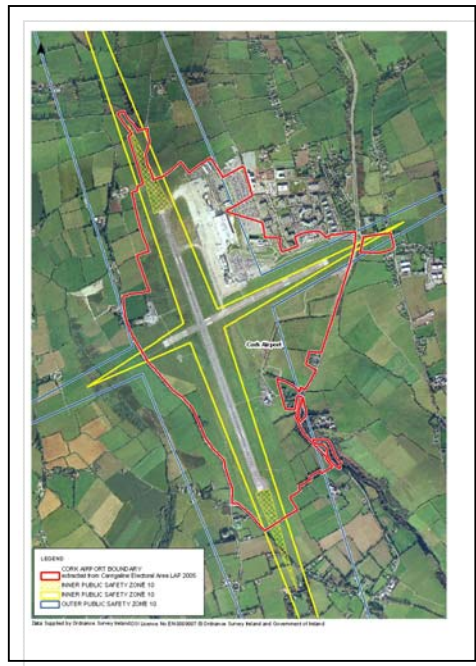
- Red Zones These zones, which are illustrated in Map 5.1 (see Appendix 2 for enlarged version) and also referred to as Safety Zones or Protection Zones, have clear associated restrictions where no buildings or structures may *"be erected except in exceptional circumstances"* and extend approximately 1,800m from the end of each runway reaching up to 875m wide at their furthest extent from the runways.
- Inner Zone All areas within approximately 4.8km of the airport's centre point are subject to variable building or structure height restrictions of down to a limit of 30m in close proximity to the Red Zones, depending on ground elevation.
- Intermediate Zone All areas within a radius of approximately 6.9km of the airport's centre point are subject to general building or structure height restrictions of less than 45m.
- Outer Zone This further zone extends from 6.9km to 16.9km from the airport's centre point and proposals for structures within it that exceed 60m in height are subject to consultation.



Map 5.1 Red Zones for Cork Airport

## Zoning Standards: Public Safety Zones

A detailed report on the PSZs of the three State airports was published in February 2005, prepared by ERM on behalf of the Department of Transport and the Department of Environment, Heritage and Local Government. The report outlines the process undertaken in defining and calculating the PSZs for Cork, Dublin and Shannon airports. It also provides detailed maps illustrating the extent of the inner and outer PSZs, as shown in Maps 5.2 and 5.3 (see Appendix 2 for enlarged versions), and outlines recommendations and conclusions for the PSZs. These PSZs assess the risk to the public on the ground from aircraft crashes.



Map 5.2 Inner Public Safety Zone for Cork Airport



Map 5.3 Outer Public Safety Zone for Cork Airport

The report proposes two PSZs for Cork Airport and puts forward recommendations for existing and future development within these zones:

- Inner PSZ (extent set at an individual risk of 1 in 100,000 per year) – prevent further development within inner PSZs, but allow existing development to remain; and
- Outer PSZ (extent set at an individual risk of 1 in one million per year) – allow existing development to remain within the outer PSZs, but prevent high density housing development, and the building of schools, hospitals and facilities attracting large numbers of people.

The only exceptions for permitted development in the inner PSZ are:

- Developments where persons are not expected to be present;
- Long stay car parks (i.e. greater than 24 hours), provided that persons are normally expected to park their car and then immediately leave the car park development. Buildings associated with car parks are subjected to the guidance given in the table below; and
- Roads and railways where vehicles and passenger trains/trams are not expected to be stationary. For example, road vehicles can be expected to be stationary at major road intersections, junctions and traffic lights and similar should not be permitted in the Inner PSZ.



In most cases the guidance outlined in the table below, which is extracted from the ERM report, will be sufficient to identify whether a proposed development should be permitted in the Outer PSZ. However, there may be cases, in exceptional circumstances, where it is judged that developments where the socio-economic benefits outweigh the associated 'safety risk', and that it is impractical for such a development to be located elsewhere, can be permitted. An airport passenger terminal is one example of such a development.

Extensions to existing developments are permitted provided that the development is of a permitted development type, and the proposed extended development does not result in the density figures listed in the table below being exceeded. Roads and railways are permitted in the Outer PSZs, including major road and rail intersections, junctions and traffic lights. Bus and rail terminals are permitted in the Outer PSZs provided the density does not exceed 110 persons per half hectare. Car parks are permitted in the Outer PSZs. This is provided that persons are normally expected to park their cars and then leave the car park development.

Permitted Developments	Public Safety Zone (PSZ)	
	Inner PSZ	Outer PSZ
All developments	No further development (existing developments remain)	see below (existing developments remain)
		<b>Outer PSZ</b>
1. Housing		≤ 60 persons/half hectare
2. Holiday Accommodation		≤ 100 beds per development
3. Retail/Leisure Facilities		≤ 85 persons/half hectare
4. Working Premises		≤ 110 persons/half hectare
5. Institutional Accommodation		No further development
6. Sports Stadia		No further development
7. Limited Use		≤ 220 persons/half hectare
	<b>No restrictions on development beyond Outer PSZ</b>	
<b>Notes</b>		
1. Housing – i.e. residential accommodation, persons at home.		
2. Holiday Accommodation – i.e. hotels, caravan parks.		
3. Retail/Leisure Facilities – i.e. shopping centres, sports halls, sports grounds, swimming pools, bowling alleys, golf clubs.		
4. Working Premises – i.e. factories, offices and facilities where persons are expected to congregate, such as railway stations.		
5. Institutional Accommodation – i.e. hospitals, schools, nurseries, care homes, prisons.		
6. Sports Stadia – i.e. football/rugby stadia.		
7. Limited Use – use not exceeding (approximately) a maximum of 12 hours in one week. i.e. Sunday markets, car boot sales, day fairs.		

Table 5.1 Permitted Developments (applicable to new applications for development) with Inner and Outer PSZs (Source: ERM Report 2005)

The ERM report concludes that the proposed Inner and Outer PSZs provide appropriate consistency with established risk criteria and zoning practice around airports, and around chemical installations in Ireland, whilst recognizing the differences between hazards presented by chemical installations and aircraft approaching and departing airports. The report concludes that adoption of the PSZs would not require any changes to existing land-use around the airports, and would only require minimal changes to proposed development plans.

## Summary

The PSZs report presents a very detailed and up-to-date assessment of the risks to the public due to aircraft crashes. The Department of the Environment, Heritage and Local Government is in the process of drawing up guidelines for planning authorities to implement the PSZs. A draft of these guidelines are due for publication in Autumn 2009 at which time there will be a period of consultation and revision before being finalised. After the final guidelines are published planning authorities will be bound, under Section 28 of the Planning and Development Regulations, 2001, to have regard to the guidelines when determining any planning applications that might interfere with the safety and/or efficiency of aircraft navigation. When adopted, these PSZs will help protect the public, whilst the red zones will continue to aid safe navigation of aircraft."

## 5.4 Noise Contours

There are currently three established noise contours, namely, 57 dB, 66 dB and 72 dB, associated with aircraft operations at Cork Airport, as illustrated in Map 5.4 (see Appendix 2 for enlarged version). The current Cork County Development Plan (2003-2009) does not make specific note of noise considerations, particularly noise associated with aviation activity. However, using the UK's Planning Policy Guidance note 24 on Noise prepared by the UK Government's Department for Communities and Local Government the following definition is noteworthy: *"[the Government] considers that housing, hospitals and schools should generally be regarded as noise sensitive development, but planning authorities may wish to include other developments or uses within this definition, depending on local circumstances and priorities and, if so, these should be explained in the development plan"*.

Aviation related noise is an important issue given the timeframe of the planned expansion of Cork Airport. It is important that the current noise contours are shown on relevant future land use plan maps. Consideration must take account of current noise levels and possible future noise level increases due to the future airport growth and development thus not compromising the long-term future needs of the airport. In general, it is considered appropriate to control inappropriate development within the noise contours.

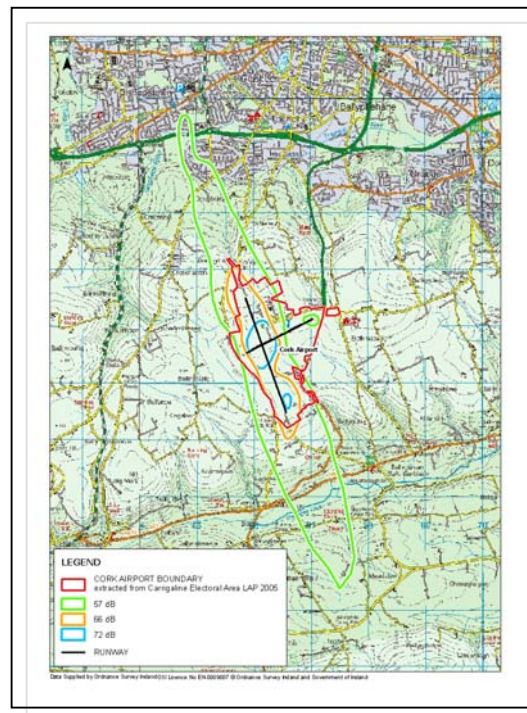


Table 5.4 Current Noise Contours for Cork Airport (Source: Cork Airport)



## 5.5 Future Environmental Assessment

Ongoing environmental assessment and monitoring will be critical to the future growth and development of Cork Airport over the timeframe of this study. The basis for carrying out this environmental assessment could include Appropriate Assessment under the Habitats Directive, Screening and Scoping for Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) and these are outlined below:

### Appropriate Assessment (under Article 6 of the European Community Habitats Directive, 1992)

Appropriate Assessment consideration is essential when undertaking a plan, programme or project that may have environmental implications. A recent judgment of the European Court of Justice (Case C-418/04) has found against Ireland with serious implications for the way that sites are designated and treated at the planning stage. The Department of the Environment Heritage and Local Government (DOEHLG) now require appropriate assessment be carried out on any plan, programme or project likely to have a potential impact on a Natura 2000 site in accordance with article 6.3 of the Habitats Directive. Natura 2000 sites are all candidate, or full, Special Areas of Conservation (SAC) or Special Protection Areas (SPA).

Article 6(3) of the Habitats Directive (92/43/EEC) states that: *“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives”*. Further guidance is provided in *Managing Natura 2000 Sites* (European Commission, 2000). This guidance recommends that the concept of ‘significant’ impact needs to be interpreted objectively in relation to the specific features of the site.

Appropriate Assessment screening has been undertaken by the local authority which has determined that the preparation of the SLAP will have no impact on any Natura 2000 sites.



**Screening for Strategic Environmental Assessment (SEA)**

Strategic Environmental Assessment (SEA) is the formal, systematic evaluation of the likely significant environmental effects of implementing a plan or programme before a decision is made to adopt the plan or programme. SEA is intended to provide the framework for influencing decision making at an earlier stage when plans and programmes, which give rise to individual projects, are being developed. It should lead to more sustainable development through the systematic appraisal of policy options.

The EU Directive on SEA (Directive 2001/42/EC), which applies to certain plans and programmes, was adopted in June 2001. This Directive was transposed into Irish law through the adoption of the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. 436 OF 2004).

As part of the SEA process a full screening assessment will need to be undertaken as part of the preparation of a Special Local Area Plan for Cork Airport to determine whether undertaking a full SEA is required. The key to deciding if an SEA will apply to the Special LAP for the airport will be whether the plan would be likely to have significant effects on the environment. The decision should not be determined by the size of an area alone. It will also be influenced by the nature and extent of the development likely to be proposed in the plan and its location (e.g. close to or within an SAC, SPA or NHA), and its broad environmental effects.

Where it has been established following screening, the contents of the Environmental Report need to be scoped. This is to ensure that the relevant environmental issues are identified so that they can be addressed appropriately in the Environmental Report.

Scoping is the procedure whereby the range of environmental issues and the level of detail to be included in the environmental assessment are decided upon, in consultation with the prescribed environmental authorities. Regard must be had to Article 5 and Annex 1 of the EU Directive. Scoping is a process that helps determine the direction and focus of the SEA.

**Environmental Impact Assessment**

Environmental Impact Assessment (EIA) is a procedure for:

- The systematic evaluation of the likely effects on the environment of a proposed development;
- Ensuring that adequate consideration is given to any likely effects; and
- Avoiding, reducing or offsetting any significant adverse effects.

Certain proposed infrastructure developments put forward as being strategically required for the future needs of Cork Airport, such as extensions to the passenger terminal building, development of cargo handling facility and aircraft maintenance facilities and the extension to Runway 17-35, may require the undertaking of an EIA. These proposals will require planning permission and thus will go through the development control process with the Local Authority. In some cases, regarding some of the future developments proposed it will be at the discretion of the local authority as to whether an EIA should be carried out or not.



## 5.6 Conclusion

In conjunction with the continued short-, medium- and long-term future needs development of Cork Airport as detailed in Section 4, it is essential that environmental assessment is ongoing at the airport. The various environmental constraints outlined will need to be continually monitored in line with the projected future growth and development of the airport. This includes assessment associated with all aspects of the airport's growth including development airside, landside and terminal components. During the various stages of development over the short-, medium- and long-term time periods it will be necessary to carry out various types of strategic and detailed environmental assessment. Public safety and noise zones need to be established on Local Authority maps and further studies will be required in these areas in line with the future growth and development. Specifically, all the zones will need to be redefined with regard to the development of any proposed extension of Runway 17-35.



## 6.0 Recommendations, Further Areas of Study and Conclusions

### 6.1 Introduction

As part of the future needs study for Cork Airport it is necessary to set out recommendations outlining the airports future growth and development up to 2040. These recommendations are set out below and follow on from the findings in sections 4 and 5. The recommendations are classified under the various airport components, namely airside, terminal and landside, and will cater for the short-, medium- and long-term development of the airport for a 30+ year timeframe. Following on from these recommendations a number of critical areas are identified in which additional study will be necessary in line with the future growth and development of Cork Airport up to 2040.

### 6.2 Recommendations

It was essential to determine the various strategic future needs, particularly in terms of infrastructure and service requirements, for the short-, medium- and long-term growth and development of Cork Airport up to 2040. The future needs of Cork Airport for this 30+ year horizon are assessed in three phases, short-term 2008-2012, medium-term 2013-2020 and long-term 2021-2040. The future needs for each stage are assessed under the airside, landside and terminal components as detailed in section 4.

In line with the various infrastructure and services provisions outlined the various recommendations arising from this study under selected criteria are outlined below. These recommendations follow on from the findings of sections 4 and 5 and from extensive stakeholder consultation with various public bodies and other key stakeholders. The recommendations for the future growth and development of Cork Airport up to 2040 are set out under the various components making up the airport; airside, terminal and landside. Figure 6.1 illustrates the four quadrants of the airport complex which the identified future needs have been separated into.

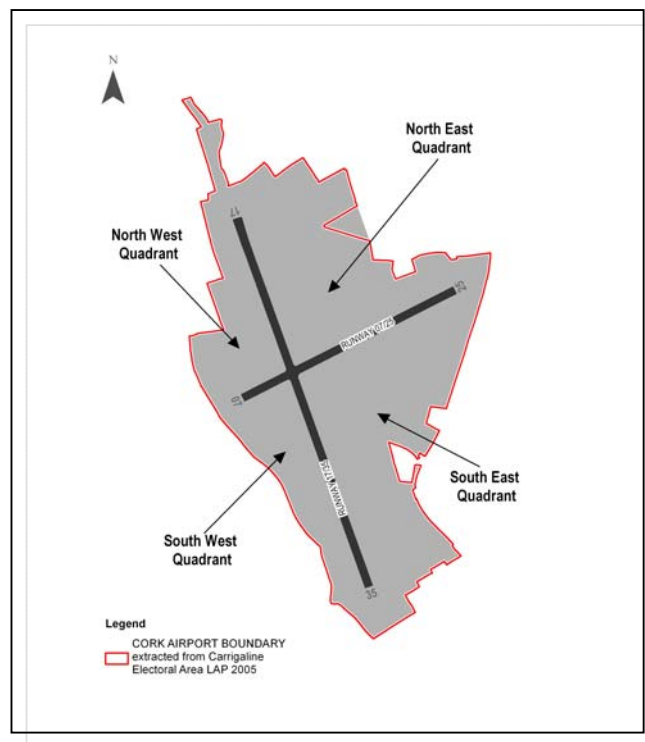


Figure 6.1 Schematic Layout of Cork Airport Complex illustrating the four Quadrant Areas



### 6.2.1 Airside Recommendations

Airside related recommendations primarily refer to the main elements which make up the airside component of an airport which are; runways (including taxiways) and aprons (including aircraft parking stands). There is an immediate requirement for additional aircraft parking stands at Cork Airport to deal with a forecast increase in passenger and aircraft movements through the airport. It is recommended that additional contact aircraft parking stands be developed in the NE Quadrant and that further remote aircraft parking stands are developed in the SE Quadrant. With the development of remote aircraft parking stands in the SE Quadrant will be the need to provide a dedicated passenger bussing facility between the passenger terminal and these remote stands.

The relocation of the private flying school and general aviation base from the SE to the SW quadrant and its continued development is recommendation. This recommendation is necessary to free up space in the SE Quadrant for the further development of the parallel taxiway into the SE Quadrant and for the development of remote aircraft parking stands in this quadrant. The extension of the parallel taxiway for Runway 17-35 from the NE Quadrant into the SE Quadrant is an immediate requirement. The extension of Runway 17-35 is an important infrastructure requirement. It is recommended that runway 17-35 be extended to enable the operation of long-haul and transatlantic flights. Allied to this will be the further development of the parallel taxiway to compliment this extension to Runway 17-35. Therefore, a feasibility study needs to be undertaken immediately by the airport authority to determine the most suitable direction and length of the extension. To cater for this extension it will be necessary to acquire additional lands to the south of the current airport boundary. To further increase the attractiveness of Cork Airport to various airlines operators and to increase the airports competitiveness it is recommended that a separate aircraft maintenance facility be developed in the SE Quadrant.

#### Summary of Airside Related Recommendations – 2008-2040:

##### Apron & Parking Stand Development

- Development of contact aircraft parking stands and associated apron in NE Quadrant;
- Development of remote aircraft parking stands and associated apron in SE Quadrant;
- Provision of a dedicated passenger bussing facility.

##### Runway Extension & Parallel Taxiway Development

- Development of extension of parallel taxiway to Runway 17-35 into SE Quadrant;
- Undertaking of a feasibility study for the extension of Runway 17- 35.

##### Other Airside Related Developments

- Relocation of private flying school and general aviation aircraft base including all ancillaries from SE to SW Quadrant and development of the same;
- Development of aircraft maintenance facility through the provision of a common-user aircraft hangar in SE Quadrant;
- Relocation of Fire Station from NE to NW Quadrant.



### 6.2.2 Terminal Recommendations

The new terminal building opened in 2006 with a design capacity to cater for +3 million passengers per annum. The number of passengers passing through the airport in 2007 was 3.2 million passengers and to accommodate for the forecast passenger growth, reaching approximately 16 mppa in 2040, it is recommended that the new terminal building be extended to cater for a forecasted increase in passenger growth in line with the detailed phasing outlined in section 4. In line with the future expansion of the new terminal building it is recommended that the old terminal building be demolished to allow space for the future expansion of the new terminal building.

It is recommended that the existing cargo warehouse facilities positioned to the north of the new passenger terminal building will require relocation to the SE Quadrant with the development of a new cargo handling facility. This will provide space in the NE Quadrant for the further extension of the passenger terminal and allow for the growth of a separate cargo handling facility in the SE Quadrant.

#### Summary of Terminal Recommendations – 2008-2040:

- Extension to new passenger terminal building in NE Quadrant;
- Demolition of old non-operational passenger terminal building;
- Development of separate cargo handling facility in SE Quadrant.

### 6.2.3 Landside Recommendations

Landside related recommendations refer to all car parking infrastructure requirements at the airport including short- and long-term parking, car hire facilities, staff parking, and in addition public transport, road infrastructure and access/egress to the airport.

With the projected growth in annual passenger throughput at the airport and the associated increase in private car demand it will be necessary to develop additional short- and long-term, car-hire and staff car parking facilities at the airport over the lifetime of this study. As outlined in section 4 it is recommended that these facilities be developed in various stages linked to the continued future growth and development of the airport. It is recommended that additional land is acquired to the north of the NE Quadrant to cater and allow for the continued growth and development of car parking at the airport, particularly long-term.. Car hire facilities at present are located at various locations in the NE Quadrant. It is recommended that these car hire facilities be centralised in the NE Quadrant.

Development of public transportation is a key recommendation arising from this study. Public transportation needs to develop in tandem with the growth and development of the airport to offer a real and sustainable alternative to private car use. The development of an integrated public transportation system between Cork Airport, Cork City and region is essential to the future growth of the airport. As outlined in section 4 it is recommended that this develops in line with the other various stages of landside development.

Access and egress to the airport is of critical importance to the continued growth and development of the airport and it is recommended that they be continually developed with the provision of both a secure access point to SE Quadrant and a secondary alternative access to the airport through the NE Quadrant. Associated with this recommendation is the continued upgrading and development of the roads infrastructure serving the airport.



### Landside Recommendations – 2008-2040:

#### Car Parking & Car Hire Facilities

- Provision of additional short- and long-term, car hire and staff car parking spaces;
- Acquisition of additional land to the north of NE quadrant for car parking needs;
- Centralisation and development of car hire activities in the NE Quadrant.

#### Transport

- Provision of a secure access point to SE Quadrant;
- Provision of an integrated public transport system;
- Provision of secondary complimentary access;
- Improve accessibility;
- Improve and upgrade road infrastructure in line with future growth.

#### 6.2.4 Summary of Recommendations

To allow for the future growth and development of the airport over the short-, medium- and long-term to 2040 it is necessary to develop essential infrastructure and service requirements for the airside, terminal and landside components of the airport complex. A main priority of this study is to protect the current airport lands from inappropriate uses and to utilise the existing space by the best means possible. As outlined as an important recommendation it will be necessary for the airport to acquire additional land to the north of the NE Quadrant and to the south of the SE and SW Quadrants for landside and airside component development, respectively. Terminal passenger building development will be required through the continued expansion of the new terminal building. The further development of an integrated public transportation system is recommended in that it will improve the accessibility to Cork Airport from both the city and the south-west region. Figure 6.2 sets out the complete future needs requirements for the airport for the next 30+ years.

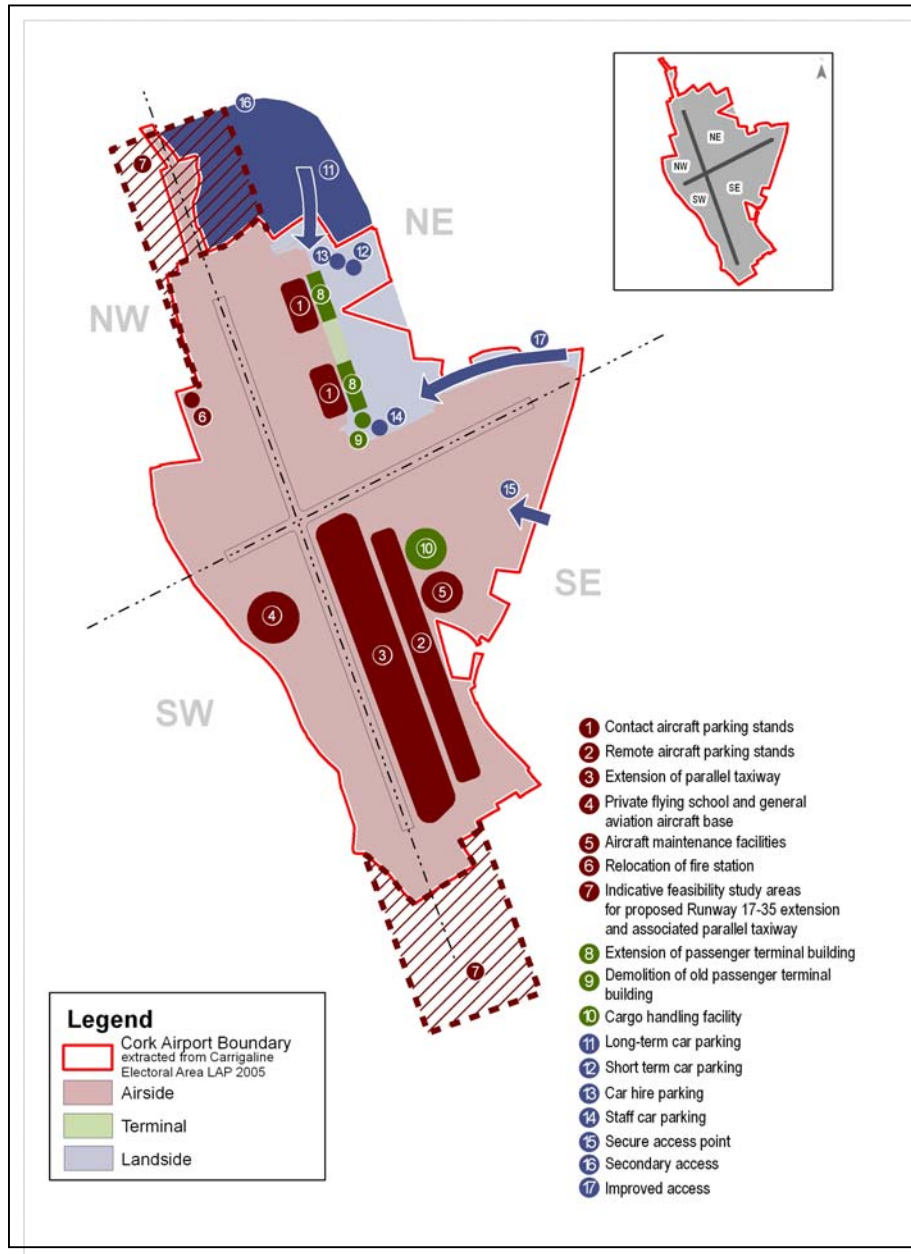


Figure 6.2: Schematic Layout of Overall Future Needs of Cork Airport - 2008 to 2040

### 6.3 Areas Requiring Additional Study

During the various stages of development over the short-, medium- and long-term time periods it will be necessary to carry out various types of strategic and detailed environmental assessment. The various environmental constraints outlined will need to be continually monitored in line with the projected future growth and development of the airport. This includes assessment associated with all aspects of the airport's growth including development of airside, landside and terminal components. Public safety and noise zones need to be established on Local Authority maps and further studies will be required in these areas in line with the future aviation growth forecast at the airport. Specifically, all the public safety and noise zones will need to be redefined with the recommendation for the development of the proposed extension of Runway 17-35. Traffic and Noise impact and assessment in particular will need to be continually monitored and mitigated against the proposed future growth of the airport.



Other areas requiring further study including detailed studies of airside and landside components of the airport will be necessary to allow the airport to grow and develop in the most sustainable manner possible. The areas in which these additional studies will need to be carried out are outlined in detail below:

**Airside** Additional studies will be necessary to look at the needs and requirements to develop the airside component of the airport. This is seen as essential to ensure that the various infrastructure requirements are provided to cater for the projected future growth of aircraft movements for up to 2040. To determine the required number of contact and remote aircraft parking stands based on the strategic development phasing will require ongoing detailed aircraft stand capacity studies to be undertaken. There is an immediate need to undertake a feasibility study by the airport authority to determine the most suitable direction and length of the extension to Runway 17-35. In addition, the proposed extension to Runway 17-35, its requirements and implications, will necessitate further study and analysis in the form of capacity assessment, design and planning. The undertaking of these airside studies will be the responsibility of the airport authority.

**Terminal** With the required continued expansion of the new passenger terminal building detailed ongoing terminal capacity assessments in line with the strategic phasing of development will be required to ensure the provision of the required size and number of areas and processes to cater for the forecast passenger growth. Similar to the required airside studies, the undertaking of the terminal capacity assessments will be the responsibility of the airport authority.

**Landside** Additional studies will be necessary to address the needs and requirements to develop the landside component of the airport.

This will involve ongoing car parking capacity analysis to look at future projected needs and options for future development of short and long-term, car-hire and staff parking at the airport.

A traffic impact assessment was carried out as part of the Environmental Impact Assessment of the Terminal Development, 2001. It provided a comprehensive statutory assessment of traffic impacts due to the construction of the new terminal facility. Continued traffic assessment will be required as part of any increased development at the airport. This traffic assessment will form part of any future proposed development at the airport which may require an associated EIS. Traffic assessment will need to be continually updated in line with the various recommendations outlined for the short-, medium- and long-term growth and development of the airport up to 2040.

Also, studies will also be necessary regarding the proposed future development of an integrated public transportation system between Cork Airport, Cork City and the region. Further transportation assessment will be required to look specifically at access and egress at the airport and the road infrastructure serving the airport. Specifically, resulting from the undertaking of the current feasibility study of the potential Rapid Transit Corridor incorporating the airport, as set out in the CASP Update, there will be a requirement to undertake an airport needs assessment/study that extends beyond the extent of the existing airport boundary.

The undertaking of the car parking capacity analysis and traffic assessment will be the responsibility of the airport authority, while the assessment of public transport, accessibility and road infrastructure requirements will be the responsibility of both Cork County Council and the airport authority. The *'Cork Airport Transportation Study'* (2008) puts forward specific recommendations regarding the short- to medium-term transportation requirements to cater for the airport's forecast passenger and employee growth which should be fully implemented.



- Environmental** There will be a requirement for the undertaking of various environmental studies in the form of EIA/SEA, and ongoing environmental assessment, as the airport grows and develops. This will follow on from the 2001 Environmental Impact Assessment of the Terminal Development and the 2007 Environmental Assessment of the Intensification of Airside Operations at the Airport. Environmental Assessment in the form of Environmental Impact Assessment on certain proposed future developments, such as the runway extension and the construction of the aircraft maintenance hangar, may require the preparation of a separate EIS under Planning and Development Regulations. Each infrastructure development application will be assessed by the Local Authority who will advise whether Environmental Assessment would be necessary or not. Screening for SEA and Appropriate Assessment (under Article 6 of the European Community Habitats Directive, 1992) will need to be carried as part of any future proposed land use plans for Cork Airport.
- Public Safety** Certain areas in the vicinity of Cork Airport are subject to certain building height restrictions for the purposes of providing an obstacle clear surface to ensure safe navigation of airborne aircraft and protecting people on the ground. These areas are referred to as obstacle clear surfaces. They are delineated in detailed maps and different restrictions apply in each different category of zone. Proposed development planning applications in the vicinity of these zones are referred to the Irish Aviation Authority (IAA) by Cork County Council's Planning Department to seek their observations as part of the statutory planning process under Section 28 of the Planning and Development Regulations, 2001. In preparing observations the IAA will, among other considerations, have regard to the proposed development's height and proximity to these zones. In line with the proposed extension to Runway 17-35 it will be necessary to carry out an additional study of these obstacle clear surfaces, which will need to be amended in tandem with the extension to the runway. This will require further assessment to establish new boundaries for the Red Zones. This study will be undertaken in conjunction with the IAA, Cork County Council and the airport authority.
- A detailed report on public safety zones was published in February 2005, prepared by ERM on behalf of the Department of Transport and the Department of Environment, Heritage and Local Government. The report outlines the process undertaken in defining and calculating the Public Safety Zones (PSZs) for Cork, Dublin and Shannon airports. It also provides detailed maps showing the extent of the inner and outer PSZs and outlines recommendations and conclusions for the PSZs. These PSZs assess the risk to the public on the ground from aircraft crashes. With the proposed extension to Runway 17-35 as outlined in section 4 it will be necessary to carry out additional assessment of these inner and outer public safety zones and to what effect the proposed extension of Runway 17-35 may have on these zones. This will require further study into the area of public safety zones and the calculation and mapping of new inner and outer public safety zones, particularly relating the proposed extended Runway 17-35.
- Noise** It is estimated that intensification of airside operations will result in an increase in commercial aircraft movements from over 35,300 in 2007 to over 152,500 in 2040. The impacts of the resulting noise emissions should be examined in any Environmental Assessment, taking into account the surrounding population and mitigation measures such as new noise minimising technology being developed within newer aircraft. A comprehensive noise assessment needs to be undertaken, and particularly a review of the existing noise contours established at Cork Airport. The existing noise contours will need to be reviewed in light of the forthcoming EU Directive on Environmental Noise and other information which comes to light, including ongoing noise monitoring. Noise Impact Assessment will need to be continually carried out in the short-, medium- and long-term at the airport. The undertaking of noise assessment studies will be the responsibility of the airport authority.



## 6.4 Implementation

The following table sets out the implementation requirements, the strategic phase of implementation and responsibilities associated with the future required airside, terminal and landside infrastructure and service needs from 2008 to 2040:

Associated Airport Component	Requirement	Strategic Phase	Responsibility
<b>Airside</b>	Assessment and development of aircraft parking stands	1, 2 & 3	Airport Authority
	Provision of passenger bussing facility	1, 2 & 3	Airport Authority
	Extension of parallel taxiway to Runway 17-35	1	Airport Authority
	Relocation and development of general aviation aircraft base	1, 2 & 3	Airport Authority
	Development of aircraft maintenance facility	1, 2 & 3	Airport Authority
	Feasibility Study of extension Runway 17-35 and associated additional analysis	1	Airport Authority
	Relocation of Fire Station	2	Airport Authority
<b>Terminal</b>	Assessment and development of terminal passenger building expansion	1, 2 & 3	Airport Authority
	Demolition of old non-operational passenger terminal building	1	Airport Authority
	Development of separate cargo handling facility	1, 2 & 3	Airport Authority
<b>Landside</b>	Car parking capacity analysis	1, 2 & 3	Airport Authority
	Provision of additional short-/long-term, car hire and staff car parking spaces	1, 2 & 3	Airport Authority
	Acquisition of additional land for additional car parking needs	1, 2 & 3	Cork County Council and Airport Authority
	Assessment and provision of public transport, accessibility and road infrastructure requirements	1, 2 & 3	Cork County Council, Airport Authority and transport providers

Table 6.1 Implementation Requirements, Strategic Phase and Responsibilities Associated with Infrastructure and Service Needs for Cork Airport Complex from 2008 to 2040





## 6.5 Conclusions

The development and expansion of Cork Airport is crucial to the development and future prosperity of Cork City, County and Region. National and international access to the Cork metropolitan area and surrounding hinterland is a critical ingredient of the area's future growth, particularly in terms of economic prosperity and supporting and developing indigenous and foreign investment. Cork Airport is a vital element of national transport infrastructure which harnesses economic and social development and growth. The airport is a particularly key element of the regional infrastructure of the South West.

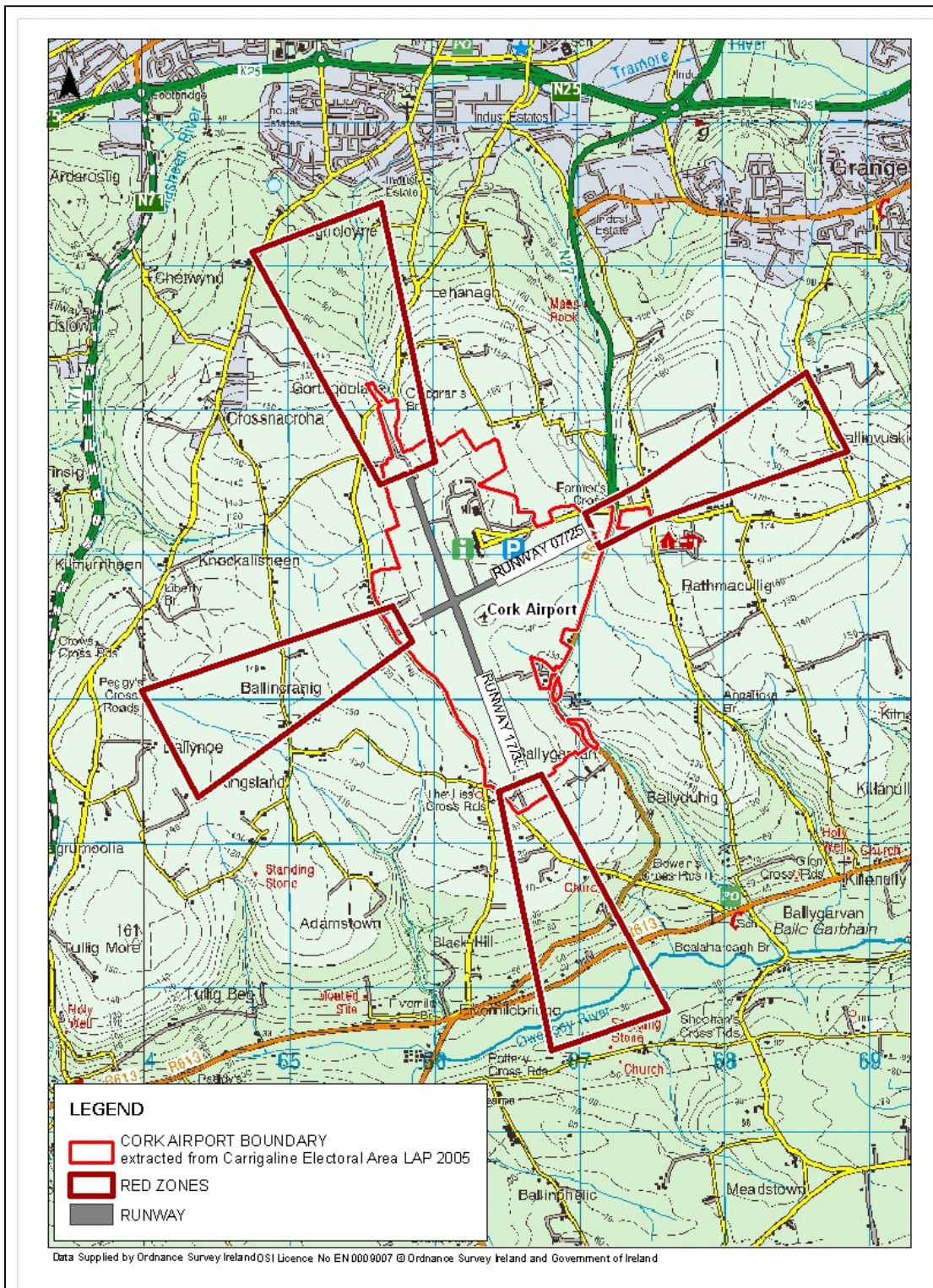
Over the next 30+ years passenger and commercial aircraft movements, together with cargo tonnage, are forecast to grow significantly at Cork Airport. In particular, between 2007 and 2040, annual passenger throughput will increase from 3.2m to 15.9m representing almost a 500% growth rate, with annual total commercial aircraft movements increasing from over 35,300 to over 152,500 equating to a growth rate of nearly 432%. It is essential that the strategic future needs of the airport associated with the forecast growth are fully catered for in terms of infrastructure and service requirements, for the short-, medium- and long-term growth and development of Cork Airport up to 2040.

In this regard, specific planning provision needs to be made for a future incremental increase in the capacity of Cork Airport to cater for the forecast growth in passenger and aircraft movements and cargo tonnage.

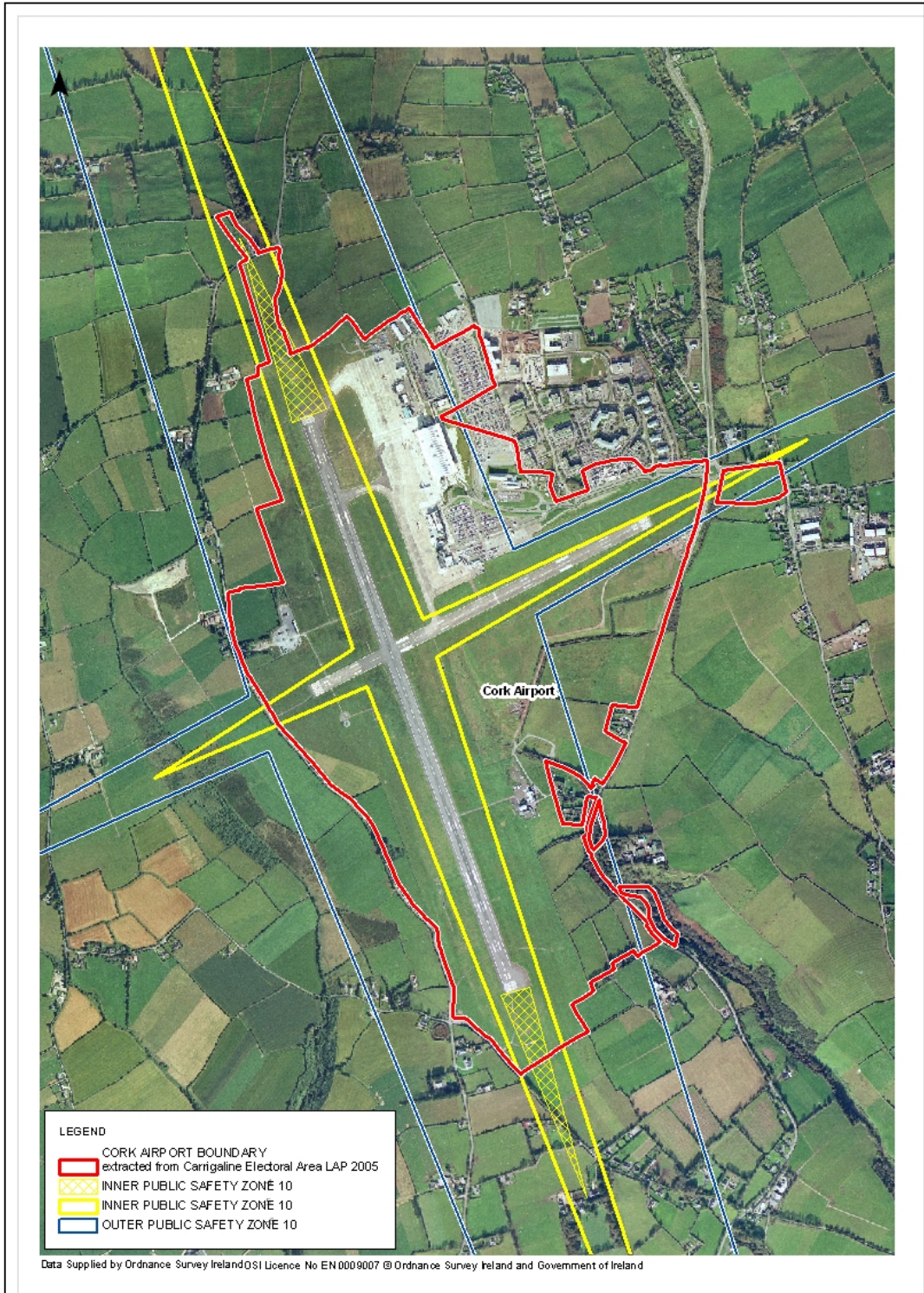
The various strategic future needs of Cork Airport for this 30+ year horizon period have been determined, particularly in terms of infrastructure and service requirements, for the short-, medium- and long-term growth and development, in three phases, 2008-2012, 2013-2020 and 2021-2040, respectively. The future needs for each strategic phase have been assessed under the airside, terminal and landside components.

It is essential that the identified future needs for Cork Airport are strategically provided for over the 30+ year timeframe of this study to ensure the continued growth and development of the airport, thus enabling this significant infrastructure asset to play a pivotal role in the ongoing socio-economic advancement of Cork County, City and South West Region.

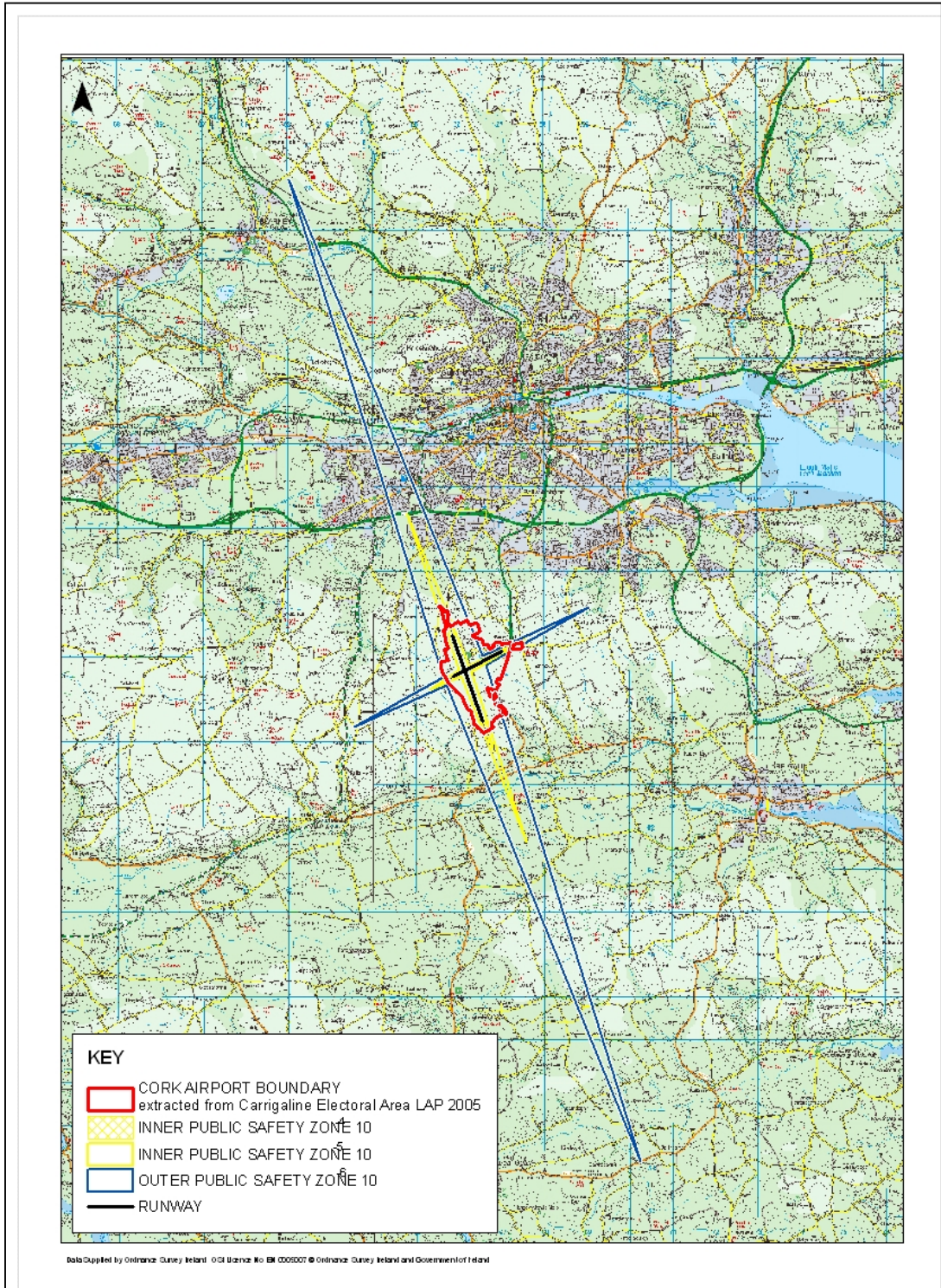
## Appendix 1 Illustrations



Map 5.1 Red Zones for Cork Airport



Map 5.2 Inner Public Safety Zone for Cork Airport



Map 5.3 Outer Public Safety Zone for Cork Airport

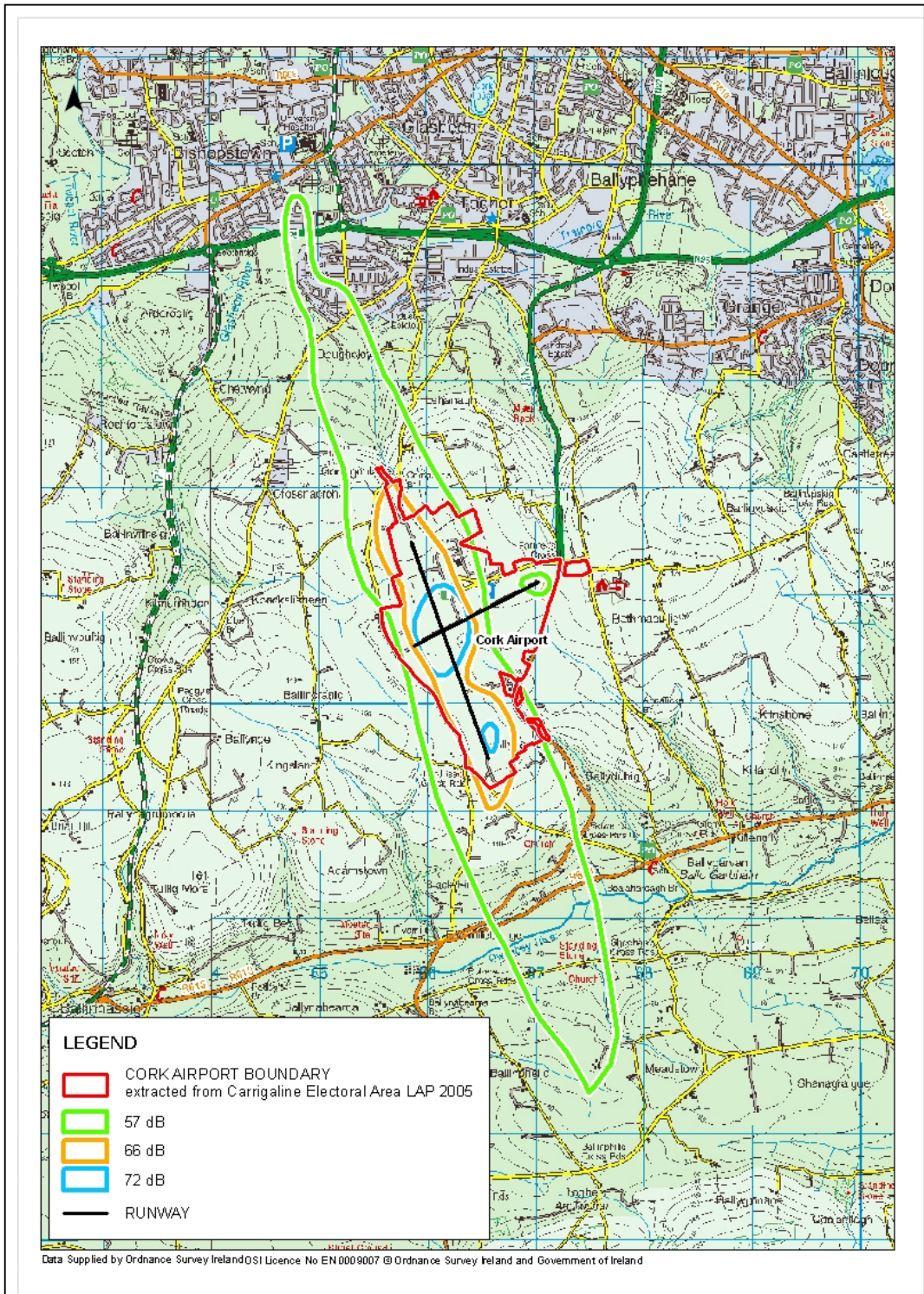


Table 5.4 Current Noise Contours for Cork Airport (Source: Cork Airport)

