

# GLOBAL REACH NATIONAL SUCCESS

## Dublin Airport Economic Impact Study 2019

Dublin Airport contributed



3.1% of Ireland's GDP

Dublin Airport facilitates



jobs in the Republic of Ireland

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1.0

# Executive Summary

Dublin Airport facilitates



# 129,700



jobs in the ROI

**The current economic impact of Dublin Airport: combining its direct, indirect, induced and catalytic impacts, Dublin Airport currently facilitates 129,700 jobs and generates €9.8 billion in Gross Value Added (GVA).<sup>1</sup> Fingal is the single largest beneficiary accounting for 89% of the direct jobs impact, while multiplier and catalytic impacts are much more widely distributed, reflecting the airport's contribution to the entire Irish economy.**

As a small, open economy, Ireland is crucially dependent on its air links to facilitate its economy, and this analysis underscores Dublin Airport's key role as a strategic enabler for business growth and economic development. This report found that Dublin Airport's connectivity grew by 59% in the last five years, making it the second fastest growing major airport in Europe. This has important implications for the wider economy of Ireland as the value of exports with well-connected countries is typically five to six times that of trade with poorly connected countries. Maintaining or further enhancing connectivity is dependent on supportive and expansive aviation policy, regulation and planning regimes to facilitate continuing investment in airport facilities to meet demand.

<sup>1</sup> Gross Value Added (GVA) is the value of the operating surpluses of business linked to Dublin Airport, plus the income/wages of employees and consumption of fixed capital. Gross Domestic Product (GDP) is the sum of the GVA of all industries plus taxes less subsidies on production.



**Key economic impacts include:**

- > **Direct Economic Impact.**  
 The direct employment, income and economic output associated with the operation and management of activities at the airport, including firms on-site at the airport and airport-related businesses located elsewhere near the airport.
- > **Indirect Economic Impact.**  
 The employment, income and economic output generated by industries arising from their supply and support of activities at the airport, such as food wholesalers, fuel refiners, etc.
- > **Induced Economic Impact.**  
 The economic activity generated by the employees of firms directly or indirectly connected to the airport spending their income in the national economy.
- > **Catalytic Impacts.** These capture the way in which the airport facilitates the business of other sectors of the economy. As such, air transportation facilitates employment and economic development in the

national economy by facilitating trade, tourism, investment and productivity growth.

daa had previously commissioned a study of the economic impact of Dublin Airport based on 2013 traffic and employment levels. These economic impact estimates have been updated to reflect 2018 traffic and activity levels and are summarised in **Figure ES-1**.

Direct employment associated with ongoing operations at Dublin Airport (e.g. daa, airlines, air traffic control, ground handlers, airport security, immigration, customs, airport retail, etc.) amounts to 21,500 jobs. Adjusting for part-time and seasonal employment, equates to 19,200 Full-Time Equivalent jobs (FTEs). The total direct GVA generated by Dublin Airport is estimated to be €1.8 billion.

Adding in multiplier impacts (indirect and induced), the total employment supported by activities at Dublin Airport is estimated to be 49,000 jobs (or 43,600 FTEs), earning a total of €1.9 billion.

**Figure ES-1:**  
**Total Economic Impact Generated and Facilitated by Dublin Airport (2018)**

Impact	Numbers of Jobs	Full-time equivalents (FTEs)	Wages (€ Millions)	GVA (€ Millions)	GVA as % of National GDP
Direct	21,500	19,200	€879	€1,777	0.6%
Indirect	12,500	11,100	€516	€985	0.3%
Induced	15,000	13,300	€521	€1,045	0.3%
Catalytic	80,700	71,300	€3,057	€5,994	1.9%
<b>Total</b>	<b>129,700</b>	<b>114,900</b>	<b>€4,973</b>	<b>€9,801</b>	<b>3.1%</b>

Updated figures based on 2018 traffic levels. All financial figures are in 2018 prices. Numbers may not add up due to rounding.

Air services at Dublin Airport facilitate large scale tourism, high-value exports to increasingly diverse international markets and enables employees of Irish and multinational businesses to travel to clients, regional offices and global headquarters. Many of the businesses with regional headquarters in Ireland would not be located there without the connectivity that Dublin Airport provides. The catalytic impacts of Dublin Airport were estimated to amount to 80,700 jobs (71,300 FTEs) and €6.0 billion in GVA.

The total economic impact of Dublin Airport includes the activity directly related to the airport, the multiplier impacts that flow from it, and the other sectors of the economy facilitated by the airport. In total, this amounts to 129,700 jobs in Ireland, equivalent to 114,900 FTEs, earning a total of

almost €5.0 billion. Furthermore, a total of €9.8 billion is contributed to GDP, representing 3.1% of the national economy.<sup>2</sup>

It should be noted that these figures are not attempting to credit Dublin Airport with creating nearly 3.1% of the economy. The Irish economy is far more complex than that. It clearly takes a wide range of players acting together to generate economic activity – government, business, infrastructure providers, residents etc. For example, if no one had decided to build hotels in Ireland, tourism would also be substantially lower. What the figures do show is that without Dublin Airport, and particularly without the extensive connectivity at the airport, the Irish economy would not be as large, affluent or diverse as it is today.

2. Based on CSO estimates of 2018 GDP: <https://www.cso.ie/en/releasesandpublications/er/na/quarterlynationalaccountsquarter42018/>, 14 March 2018.

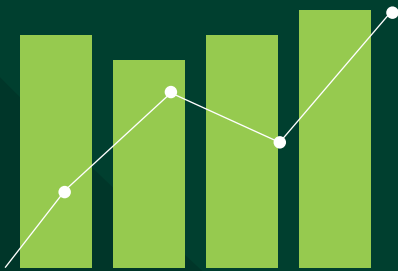






2.0

# Introduction to the Economic Report



## Economic Impact

daa commissioned InterVISTAS Consulting (InterVISTAS) to conduct a study to update the economic impact of Dublin Airport.<sup>3</sup> This report documents the methodology and findings of the study, and is structured as follows:

- > **Chapter 2** – Introduction.
- > **Chapter 3** – Outlines the methodology used to estimate the current economic impact of Dublin Airport.
- > **Chapter 4** – Presents an overview of the traffic activity at Dublin Airport and the global connectivity it provides for Ireland.
- > **Chapter 5** – Sets out the current economic contribution of ongoing operations at Dublin Airport, including the catalytic impacts.

Additional details are provided in the appendices. Key Points text boxes are provided at the start of the chapters which summarise the key points in each chapter. In addition, various businesses and organisations provided insights regarding the impact and importance of Dublin Airport to their operations, and their comments are provided throughout this report.

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<sup>3</sup>. The analysis in this report is an update to analysis conducted in 2017 by InterVISTAS on the economic impact of Dublin Airport. This update takes account of current traffic levels and the updated traffic forecasts for Dublin Airport.



## 2.1

### What is Economic Impact?

**Economic impact** is a measure of the employment, spending and economic activity associated with a business, a sector of the economy, a specific project (such as the construction of a new facility), or a change in government policy or regulation.

In this case, economic impact refers to the economic contribution associated with the ongoing activities at Dublin Airport. Economic impact can be measured in a number of ways:

- > **Employment** – the number of people employed by businesses involved in activities linked to Dublin Airport.
- > **Income/Wages** – the wages and salaries earned by the people employed in activities linked to Dublin Airport.
- > **Gross Value Added (GVA)** – the income/wages of employees plus the operating surpluses of business linked to Dublin Airport and the consumption of fixed capital. GVA is broadly equivalent to Gross Domestic Product (GDP), whereby the value-added of each industry sums to the total GDP of an economy.<sup>4</sup>

4. GDP is the sum of the GVA of all industries plus taxes less subsidies on production.





## Testimonial



Intel Ireland's Leixlip campus, located in County Kildare, began operations in 1989. Since then, Intel has invested \$13.9 billion in turning the 360 acre former stud farm into one of the most technologically advanced manufacturing locations in Europe. This is the largest private investment ever made in the history of the Irish State. Today, more than 4,500 people work at the campus in Leixlip.

The Leixlip campus is home to a semiconductor wafer fabrication facility which, in recent years, has undergone an upgrade project that has enabled the site to be a key location for production of Intel's 14nm process technology. The leading-edge silicon microprocessors which are manufactured in Ireland are at the heart of a variety of platforms and technology advancements which are essential to the way we learn, live, and work today.

The Irish operations have consistently played a central role within Intel's global manufacturing network and we have also leveraged our advanced manufacturing capability and world class infrastructure to develop new competencies for Intel in the areas of research and design.

“  
producing  
leading edge  
microprocessors  
that are shipped  
to locations  
around the  
world”

*Dublin Airport is essential to our business operations in Ireland providing a critical freight transit hub in support of our global supply chain activities. The Intel campus in Leixlip is a key manufacturing location within Intel's global network producing leading edge microprocessors that are shipped to locations around the world via Dublin Airport.*

*Dublin Airport also provides an important international gateway to and from the rest of the world for people working and living in Ireland – something which is of critical importance in the modern era of global business.*

*Sustained development of Dublin Airport will ensure that this world class facility continues to be a strategic enabler for business growth, economic development and social benefit.*

# 2.2

## Categories of Economic Impact

There are four distinct types or categories of economic impact associated with airports, as described below.

### 2.2.1

#### Direct Economic Impact

This is the employment, income and GDP associated with the operation and management of activities at Dublin Airport including firms on-site at the airport and airport-related businesses located elsewhere near the airport. This includes activities by the airport operator, the airlines, air traffic control, fixed base operators (General Aviation), ground handlers, airport security, immigration and customs, aircraft maintenance etc.

While a straight-forward definition of the direct airport economic impact would be the activities and businesses

located at the airport, this would not reflect the full extent of the airport's economic base. Other businesses closely connected to airport activities are not based at the airport (or only partially based at the airport), such as aircraft maintenance, logistics operators, aircraft parts suppliers etc. These businesses would not exist, or would be much smaller, without the activities at the airport. Therefore, off-airport businesses closely linked to airport activities were also included as part of the direct economic impact.

### 2.2.2

#### Indirect Economic Impact

This is the employment, income and GDP generated by upstream industries that supply and support the activities at Dublin Airport. For example, these include: wholesalers providing food for

inflight catering, companies providing accounting and legal services to airlines, travel agents booking flights, etc.

### 2.2.3

#### Induced Economic Impact

This captures the economic activity generated by the employees of firms directly or indirectly connected to the airport spending their income in the national economy. For example, an airline employee might spend his/

her income on groceries, restaurants, child care, dental services, home renovations and other items which, in turn, generate employment in a wide range of sectors of the general economy.

### 2.2.4

#### Catalytic Economic Impacts

While the aforementioned economic impact can be seen as resulting from activities at Dublin Airport, catalytic impacts (also known as Wider Economic Benefits) capture the way in which the airport facilitates

the business of other sectors of the economy. As such, air transportation facilitates employment and economic development in the national economy through a number of mechanisms:

> **Tourism** – Air service facilitates the arrival of large numbers of tourists to a region or country. This includes business as well as leisure tourists. The spending of these tourists can support a wide range of tourism-related businesses: hotels, restaurants, theatres, car rentals, etc. Of course, air service also facilitates outbound tourism, which can be viewed as reducing the amount of money spent in an economy. However, even outbound tourism involves spending in the home economy, on travel agents, taxis, etc. In any case, it is not necessarily the case that money spent by tourists flying abroad would be spent on tourism at home if there were no air service.

> **Trade in Goods and Services** – Whereas air cargo accounts for 1% of Ireland's exports by volume, it accounts for over 35% of exports by value, reflecting generally higher value goods often times perishable or time-critical.<sup>5</sup> Both the trade of goods and the trade of services are facilitated by passenger air services. Face-to-face meetings play a crucial role in making sales and delivering services and support. The ability to be at a client's side rapidly and cost-effectively is important to many industries. Much of the time, these functions cannot be replaced by teleconferencing or other forms of communication. A study in the UK found that a 10% increase in seat capacity increased goods exports by 3.3% and goods imports by 1.7%.<sup>6</sup> Air transport connects businesses to a wide range of global markets,

providing a significantly larger customer base for their products than would be accessible otherwise. It is particularly important for high-tech and knowledge-based sectors, and suppliers of time-sensitive goods.

> **Investment** – Air connectivity is important in attracting international business headquarters and foreign investment into a country. A key factor many companies take into account when making decisions about the location of offices, manufacturing plants or warehouses is proximity of an international airport. A study by IATA of 625 businesses in five countries (including China and the United States) found that 25% of the sales of the surveyed businesses were dependent on good air transport links. Further, 30% of Chinese firms reported that they had changed investment decisions because of constraints on air services.<sup>7</sup> Another study found that a 10% increase in supply of intercontinental air service was associated with a 4% increase in the number of large firm headquarters located in the corresponding urban area.<sup>8</sup> Ireland's island status makes air connectivity even more critical. Therefore, airports are essential assets for regions wishing to expand industrial activity. Their proximity encourages industrial development. Industries choose to locate close to airports in order to gain easy access to air transport and the associated infrastructure.

> **Productivity** – Air transportation offers access to new markets, which in turn enables businesses to achieve greater economies of scale; inward investment can enhance the productivity of the

5. Source: Irish Exporters Association.

6. PWC (2013), "Econometric Analysis to Develop Evidence on the Links Between Aviation and the Economy", Report for the UK Airports Commission, December 2013.

7. Airline Network Benefits, IATA Economic Briefing No. 3, 2006.

8. Bel, G. and Fageda, X. (2008), "Getting There Fast: Globalization, Intercontinental Flights and Location of Headquarters", Journal of Economic Geography, Vol. 8, No. 4.



labour force (e.g. state-of-the-art manufacturing facilities); air access also enables companies to attract and retain high quality employees. All of these factors contribute to enhanced productivity, which in turn increases national income. A study for Airports Council International (ACI) Europe found that a 10% increase in connectivity was associated with an increase in GDP per capita of 0.6%.<sup>9</sup>

Additional research evidence on the link between aviation and economic development is summarised in **Appendix B**. The importance of Dublin Airport to the wider economy is also reflected in the many quotes and comments in this report from businesses and organisations based in Ireland.

In effect, the catalytic impact of aviation is to increase the productive potential of the economy (in economist terms, moving the production-possibility frontier). Improvements in aviation connectivity enable economies to attract more tourists, conduct more trade and draw more foreign investment. The overall effect of all these mechanisms is an increase in employment and GDP. Without effective air transportation links, it is much harder for economies to attract tourists, to conduct trade and attract investment from other countries. As a result, the country's economy and employment potential would suffer.

It should be noted that catalytic impacts are not a simple matter of the airport generating employment and economic activity in the same

way that direct, indirect and induced impacts arise. National economies are far more complex than that. It clearly takes a wide range of players acting together to generate economic growth – government, business, infrastructure providers, residents, etc. For example, providing air connectivity alone does not guarantee large volumes of tourists. Hotels, restaurants, retail and entertainment etc. are also required. Nevertheless, without convenient air services, a destination will find it more difficult to attract tourists.

What the catalytic impacts capture is that without efficient airports and associated air services, the economy would be smaller and less affluent. Thus, catalytic impacts are about the economic value and employment that airports facilitate rather than generate.

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<sup>9</sup>. InterVISTAS Consulting, "The Economic Impact of European Airports: A Critical Catalyst to Growth", ACI Europe, January 2015.

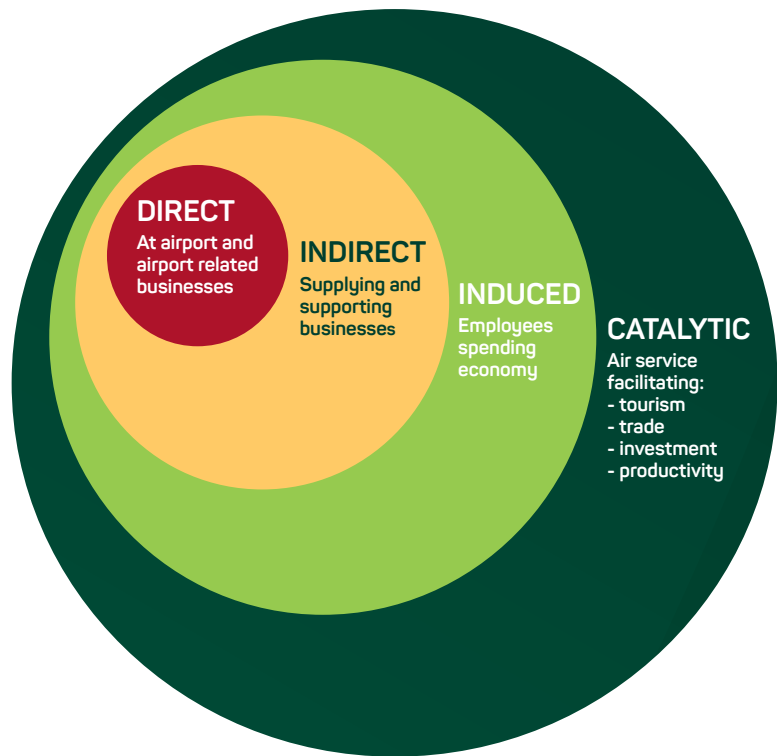
The connectivity enabled by airports is not sufficient on its own to fully support economic activity, but it is a necessary element of economic growth and development.<sup>10</sup>

In discussing catalytic impacts, the issue of causality often arises. For example, while air service can facilitate trade, it is also true that increased trade leads to increased demand for air services. This study recognises that there is a two-way relationship between air connectivity and economic growth.

Economic growth stimulates demand for air services while at the same time, these air services open up new opportunities for tourism, trade, business development, etc. This in turn can stimulate further demand for air services, and so on, in a “virtuous cycle”. The analysis in this study uses parameters that control for this two-way relationship.

Catalytic impacts are discussed in greater detail in **Chapter 5**. These four categories of impacts are summarised in **Figure 2-1**.

**Figure 2-1:**  
**Categories of Economic Impact Generated or Facilitated by Dublin Airport**



<sup>10</sup>. In many parts of the world, airports are also the contributors of some of the other necessary elements for catalytic growth. Various airports have developed their own economic and urban hubs, which can comprise of hotels, offices, entertainment, and other commercial developments, which benefit from the adjacent air connectivity provided by the airport.





## 3.0

# Methodology for the Economic Study

## 3.1

### Updating the Previous Economic Impact Study

This chapter describes the methodology and sources that were used to measure the economic impact of Dublin Airport. Results of this are provided in [Chapter 5](#).

daa commissioned InterVISTAS to complete an economic impact study on Dublin Airport, which was completed in early 2015.<sup>11</sup>

The study involved a detailed survey of businesses in and around the airport, covering passenger and cargo airlines, courier/integrators, ground handlers, government agencies, aircraft maintenance firms, air cargo, warehousing and logistics, car rental firms, hotels and airport retailers.

This survey provided a detailed and robust profile of the employment and economic activity and formed the basis for the direct economic impacts of Dublin Airport. The surveys captured information on employment levels associated with Dublin Airport in 2013. The indirect and induced

effects were estimated using economic multipliers, as is common practice for economic impact studies. These multipliers were based on the Input-Output model of the Irish economy maintained by the Central Statistics Office (CSO) Ireland. An Input-Output (I-O) model is a representation of the flows of economic activity within a region or country. The model captures what each business or sector must purchase from every other sector in order to produce a Euro's worth of goods or services. By tracing these linkages between sectors, I-O models can estimate indirect and induced impacts. The I-O models are described in more detail in [Appendix A](#).

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<sup>11</sup>. "Dublin Airport Economic Impact Study: Final Report", Prepared by InterVISTAS Consulting, April 2015.



The catalytic impacts of Dublin Airport were calculated using generalised parameters drawn from statistical analysis of historical data.

This analysis seeks to determine the contribution of air transport to economic growth by examining the relationship between these factors over time or compared between different countries (or both).

The analysis attempts to control for other factors that also contribute to economic growth (education spending, government policies, investment, research and development spending, etc.), in order to isolate the impact of air transport.

The catalytic impact of Dublin Airport was estimated in this way, using findings from recent research.

The catalytic parameter was

taken from a study undertaken by InterVISTAS on behalf of ACI Europe,<sup>12</sup> which was selected because it is the mostly recently completed study of this sort and is based on data from 40 European countries including Ireland. The parameter captures the aggregate net effect of a range of catalytic impacts, including tourism, trade, investment, business location, etc. which manifest themselves as greater per capita GDP.

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12. "The Economic Impact of European Airports: A Critical Catalyst to Growth", ACI Europe, January 2015.

A copy of the study report is available at: <https://www.dublinairport.com>.

The previous economic impact study for Dublin Airport estimated the airport's economic contribution in 2013. These figures have been updated to reflect the airport's economic contribution in 2018, taking into account the traffic growth at Dublin Airport between 2013 and 2018, updates to the I-O model by the CSO, and adjusting for inflation.<sup>13</sup>

As traffic grows at Dublin Airport, employment at the airport is also expected to increase. This includes employees at the airlines operating and supporting additional flights, as well as third party suppliers supporting the airline's operations. This would include additional ground handling services to supply, fuel and clean the increased number of aircraft and to handle the baggage of hub passengers. Government services such as security, customs, air traffic control, etc. would also require additional employment resources to handle greater passenger and aircraft traffic.

While increased air traffic is expected to result in increased employment, increases are not always proportionate. For example, if passenger traffic grows by 5%, aviation employment is expected to increase by less than 5%, due to productivity and economies of scale effects which mean that increases in traffic can be handled with a less than proportional increase in resources.

Employment elasticities were applied reflecting the anticipated relationship between traffic growth

and employment growth. To account for productivity gains and economies of scale, the direct employment impacts were estimated assuming an economic impact elasticity of 0.67, i.e. each 1% increase in traffic results in a 0.67% increase in airport activity. This elasticity was based on previous research on European airports for ACI Europe, which found evidence of economies of scale in airport employment.<sup>14</sup> The direct employment estimate was also validated against the number of permanent Airport Identification Cards issued by Dublin Airport (which captures some of the employment at the airport), as documented in **Chapter 4**. The multiplier impacts (indirect and induced) were estimated from the direct impacts, using updated multiplier ratios calculated from the CSO's latest I-O tables.<sup>15</sup>

The estimates of catalytic impacts were based on the growth in connectivity between 2013 and 2018, using the connectivity measure described in **Section 4.3**. In addition, the financial figures were increased in line with inflation, based on the increase in the Consumer Price Index (CPI) between June 2013 and June 2018.<sup>16</sup>

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<sup>13</sup>. A previous InterVISTAS report for daa estimated the economic impact of Dublin Airport in 2016 using the same traffic-based methodology described in this chapter.

<sup>14</sup>. "The Economic Impact of European Airports: A Critical Catalyst to Growth", ACI Europe, January 2015.

<sup>15</sup>. The multiplier analysis has been updated using I-O tables available from the CSO, published in October 2018 and available here: <https://www.cso.ie/en/releasesandpublications/ep/p-sauio/supplyanduseandinputoutputtablesforireland2015/>.

<sup>16</sup>. <http://www.cso.ie/en/interactivezone/activetools/cpiinflationcalculator/>.



Cláraithe  
Check-in Desks 1-28

Ticéid  
Tickets

↑

↑



↑



← **Gaeil Imeacha**  
Departure Gates

AT THE  
OF MEMORIES



35 36 37 38 39 40

Aer Lingus





4.0

# Overview of Dublin Airport



56.7%

increase in  
passengers  
over 5 years

## Key Points

- > **Passenger traffic** at Dublin Airport reached **31.5 million in 2018**, having increased 56.7% in the last five years (9.3% per annum).
- > Dublin Airport has direct **service to over 80 destinations** in over 40 countries on four continents.
- > The airport is a **home base for two major carriers**, Ryanair and Aer Lingus, and provides service to 40+ airlines.
- > The airport is a primary contributor to Ireland having **one of the highest connectivity levels on the continent** relative to the size of its population and economy.
- > In terms of connectivity, Dublin Airport has been the **second fastest growing airport** among major European airports **over the last** five years.
- > This connectivity is **critical to the economic development of Ireland**, including trade, tourism, FDI and business location decisions.



## 4.1

### Air Passenger Movements

**Dublin Airport (DUB) is the largest airport in the Republic of Ireland (and the largest on the island of Ireland). The airport acts as a point of entry for those travelling to and from Ireland, but also services connecting flights from other international destinations. Two major airlines, Aer Lingus and Ryanair, use Dublin Airport as a base for their operations:**

As shown in **Figure 4-1**, 2018 marked the busiest year in the history of the airport, with 31.5 million passengers travelling through Dublin Airport, a 6.5% increase over 2017 and 56.7% increase in the last five years (since 2013).

Following a long period of growth between 2000 and 2008, with an average growth rate of 3.4% per annum, the airport experienced significant declines in air travel in 2009 and 2010 due to the global economic downturn.<sup>17</sup> However, since 2010, traffic growth has averaged 6.9% per annum, reaching 31.5 million in 2018. Passenger traffic at Dublin Airport can be broken down into five categories: Domestic, United Kingdom, Continental Europe, Transatlantic and Other International. Of the five areas, the region which has

seen the largest growth in passenger traffic since 2010 is Other International – this includes traffic to China, the rest of Asia, Middle East and Africa. Over the past eight years, the passenger traffic on these routes has increased by over 448%, from a small base.

Transatlantic traffic has seen a growth of 155% from increased service to the United States and Canada. European and United Kingdom passenger traffic have both increased by 70% and 50% respectively. Domestic traffic, which makes up less than 1% of traffic, has seen a decrease in volume by 70%. This drop is attributable to the fact that the road network within Ireland has seen significant advancements over recent years. Total passenger traffic at Dublin Airport has seen an increase of 71.1% since 2010.

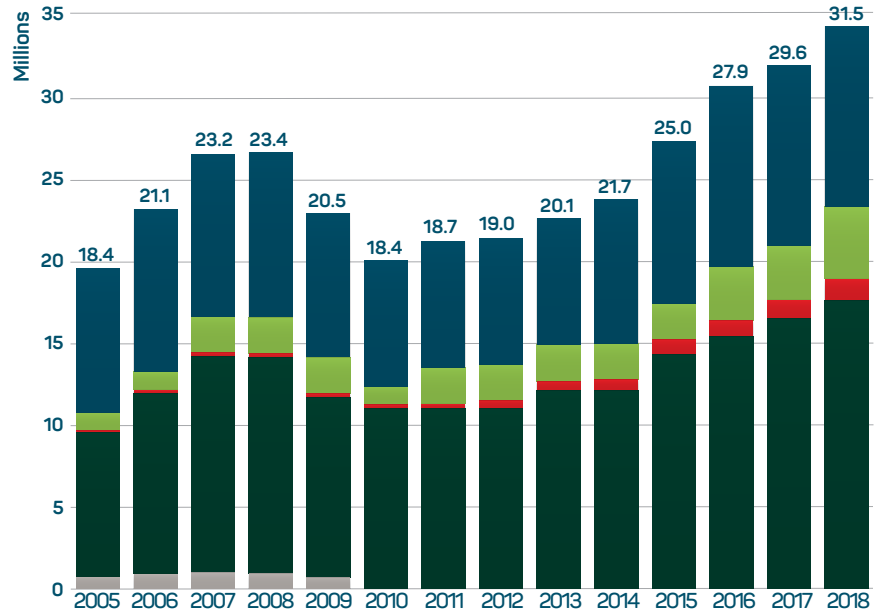
<sup>17</sup>. Based on Central Statistics Office Ireland data, the Irish economy was in recession for all of 2008 and 2009, contracting by over 10% in that period.



**31.5M**  
passengers  
making 2018 the  
busiest year in  
history

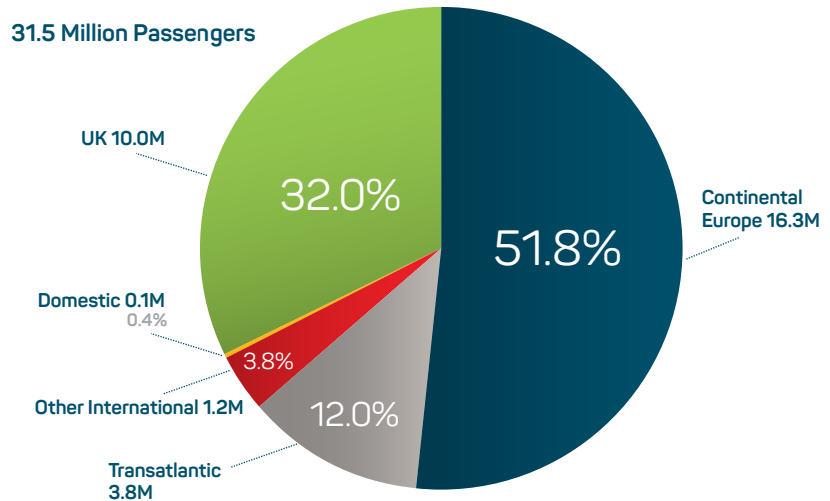


**Figure 4-1:**  
Annual Passenger Movements at Dublin International Airport,  
2005–2018



Source: daa

**Figure 4-2:**  
Passenger Movements by Region at Dublin Airport, 2018



Source: daa

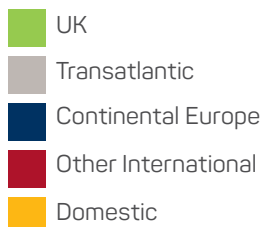


Figure 4-2 shows the percentage share of passenger traffic by region. In terms of the share of passenger traffic by world region, Continental European traffic comprised 52% of all passengers in 2018. The United Kingdom represented 32% of total passengers, followed by Transatlantic

at 12%, Other International at 4% and Domestic passenger traffic at less than 1%. Long haul passengers accounted for 15.8% of traffic in 2018 compared with 8.4% in 2008, reflecting the increasing range of destinations served from Dublin Airport.



## Testimonial

# COMBILIFT

## LIFTING INNOVATION

Combilift is the world's largest manufacturer of 4-way forklifts and a recognised leader in solutions for handling long loads. Established in 1998, the driving force behind Combilift is the desire to develop innovative solutions in the field of material handling equipment.

“  
our airfreight  
shipments  
are dispatched  
through Dublin  
Airport”



*Connectivity to global markets has been critical to the growth of Combilift. In our business, it is essential that we provide a swift service. The presence of an airport of the size of Dublin Airport with a large number of global routes has allowed us to provide a prompt service to our customers in a very competitive market. 92% of our airfreight shipments are dispatched through Dublin Airport; it is our preferred airport given its proximity to our global headquarters. By using Dublin Airport, we are able to ship goods directly to many of our key global markets.*

*The connectivity available through the growing number of new routes from Dublin ensures that customers can visit our global headquarters in Monaghan with greater ease. We worked closely with daa to ensure that over 3,000 Combilift guests attending the official opening of our Global Headquarters in 2018 were able to quickly and smoothly transit through the airport at a time suitable to their busy schedules.*

*The continued growth and expansion of Dublin Airport will enable Combilift develop its businesses and grow its labour force in Monaghan and the surrounding region.*

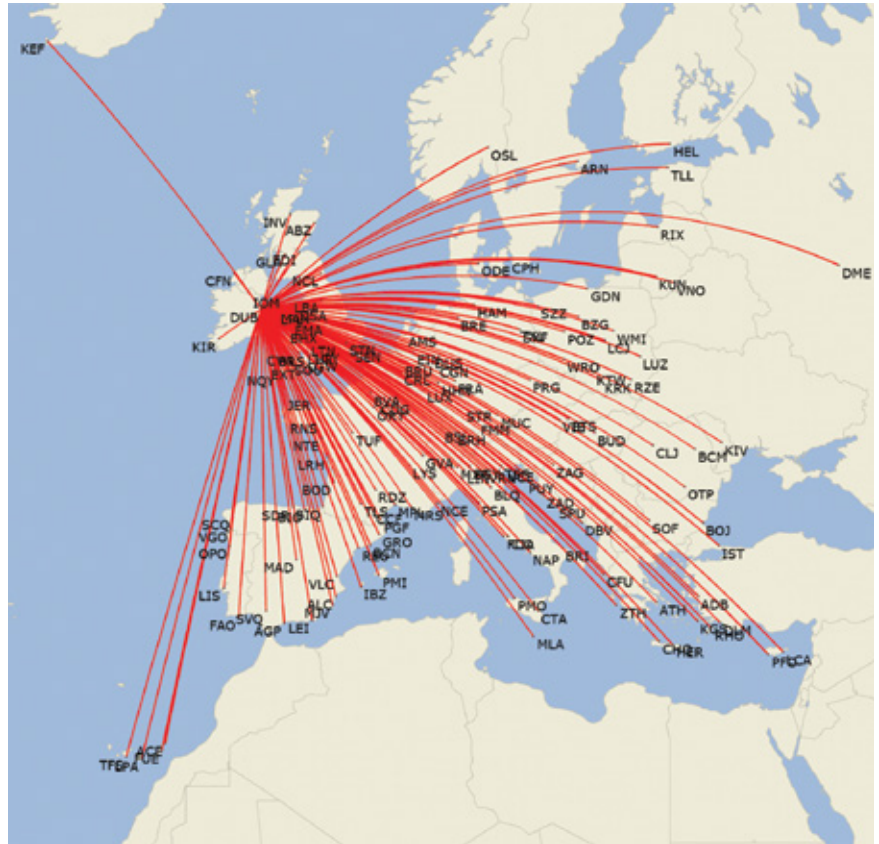


# 4.2

## Overview of Dublin Airport's Air Services

Based on schedule data for 2018, Dublin Airport served 44 airlines offering non-stop scheduled service to over 180 destinations in 42 countries on four continents. In 2018, there were over 116,000 departing flights, an average of 319 per day. Figures 4-3 and 4-4 show the scheduled passenger routes operated from Dublin Airport in 2018, across Europe and other international destinations, respectively.

**Figure 4-3:**  
Dublin Airport's European Route Network (2018)



Source: Diio Schedule Data for July 2018.

**Figure 4-4:**  
Dublin Airport's Global Route Network (2018)



Source: Diio Schedule Data for July 2018.



The most popular country for travel to and from Ireland is the United Kingdom. In 2018, 10.1 million people travelled between the two countries through Dublin Airport. On a typical busy day, there are more than 60 departures between Dublin and London, and nearly 140 between Dublin and the entire United Kingdom. Dublin-London is Europe’s busiest city route and the second busiest international route in the world.

New York is the most popular long-haul international destination with over 2,000 annual departures

(over five per day) to John F. Kennedy International (JFK) and Newark (EWR) in 2018, operated by Aer Lingus, United Airlines, Delta Air Lines and American Airlines. **Figure 4-5** lists the countries which are served directly from Dublin Airport and the number of destinations within each country in 2018. A total of 16 U.S. destinations were served from Dublin Airport in 2018, aided by the airport’s all-day U.S. preclearance facilities, Dublin being one of only two airports, and the only capital city airport, in Europe with such a facility.

**Figure 4–5:**  
**Countries Directly Connected to Dublin by Air Service from Dublin Airport, 2018**

Europe [33 countries]	
Austria (3)	Lithuania (2)
Belgium (2)	Luxembourg (1)
Bulgaria (2)	Malta (1)
Croatia (5)	Moldova (1)
Cyprus (2)	Netherlands (2)
Czech Republic (1)	Norway (1)
Denmark (1)	Poland (12)
Estonia (1)	Portugal (3)
Finland (1)	Romania (3)
France (19)	Russia (2)
Germany (11)	Slovakia (1)
Greece (7)	Spain (20)
Hungary (1)	Sweden (1)
Iceland (1)	Switzerland (3)
Ireland (2)	Turkey (3)
Italy (15)	United Kingdom (24)
Latvia (1)	
<b>Middle East [3 Countries]</b>	<b>North America [3 Countries]</b>
Israel (1)	Canada (4)
Qatar (1)	Mexico (1)
United Arab Emirates (2)	United States (16)
<b>Asia [2 Countries]</b>	<b>Africa [2 Countries]</b>
China (1)	Ethiopia (1)
Hong Kong SAR (1)	Morocco (1)

Source: Diio Schedule Data for 2018. Figures in parenthesis indicate the number of routes operated to that country.

Figure 4-6 shows the total scheduled seat capacity operated by the top 20 carriers at Dublin Airport in 2018. As shown in the table, Dublin's two home carriers, Ryanair and Aer Lingus, make up 75% of the total seat capacity. The presence of two such carriers allows the airport to develop a dense network of services to a wide range of destinations, particularly where passenger flows can be pooled to support developing air services.

The services of the home carriers are augmented by a wide range of international carriers including major network and low-cost carriers from across Europe and carriers from the Middle East, North America and Africa. In total, 44 airlines operated at Dublin Airport in 2018.

**Figure 4-6:**  
**Outbound Seat Capacity by Carrier at Dublin Airport, 2018**

Carrier	Outbound Seat Capacity (Thousands)	% Share of Total Seat Capacity
1. Ryanair	7,426	39.4%
2. Aer Lingus	6,713	35.6%
3. British Airways	576	3.1%
4. Lufthansa	379	2.0%
5. FlyBE	330	1.7%
6. Emirates	292	1.5%
7. KLM	224	1.2%
8. Norwegian	209	1.1%
9. United Airlines	206	1.1%
10. American Airlines	206	1.1%
11. Etihad Airways	187	1.0%
12. Scandinavian Airlines	180	1.0%
13. Delta Air Lines	176	0.9%
14. Air France	160	0.8%
15. Cityjet	155	0.8%
16. Air Canada	121	0.6%
17. SWISS	113	0.6%
18. Turkish Airlines	112	0.6%
19. Qatar Airways	92	0.5%
20. Ethiopian Airlines	88	0.5%
Other Airlines	924	4.9%
<b>Total</b>	<b>18,868</b>	<b>100.0%</b>

Source: Diio Schedule Data for 2018. Figures based on marketing rather than operating carrier. Notes: Numbers may not add up due to rounding.

# 4.3

## Measuring Airport Connectivity

**Connectivity is essential in the international marketplace and it is fundamentally about access to markets and destinations. A country or region that has continental and intercontinental linkages to only a limited number of destinations will be a less desirable place to do business. Travel costs for staff and for goods will be higher due to the need to purchase multiple flight legs to move people and goods. On the other hand, a community with direct access to a broad range of markets, especially the fastest growing markets, will be a lower cost place to do business. It will also enhance customer servicing and goods and support staff can easily and quickly get to a range of destinations.**

Connectivity is essential in the international marketplace and it is fundamentally about access to markets and destinations. A country or region that has continental and intercontinental linkages to only a limited number of destinations will be a less desirable place to do business. Travel costs for staff and for goods will be higher due to the need to purchase multiple flight legs to move people and goods. On the other hand, a community with direct access to a broad range of markets, especially the fastest growing markets, will be a lower cost place to do business. It will also enhance customer servicing and goods and support staff can easily and quickly get to a range of destinations.

This is a particularly important consideration for Ireland as a small open economy positioned on the western tip of Europe. Air access is critical for Ireland's economic development. Dublin Airport's pre-eminent position in the Irish aviation sector delivers the critical mass required to attract the necessary services to key short and long-haul destinations for both business and leisure markets. Direct connections are essential for both expanding Irish export trade and growing foreign direct investment in Ireland. Dublin Airport is also a key gateway for Northern Ireland, with around two million passengers travelling to and from Northern Ireland via Dublin Airport every year.

To capture the importance of connectivity, the International Air Transport Association (IATA) has developed a measure of air service connectivity which aims to measure the quality of the air transport network from the point of view of the country's economy. The IATA connectivity index seeks to measure the scope of access between an individual airport, region or country, and the global economy. The index measures the number

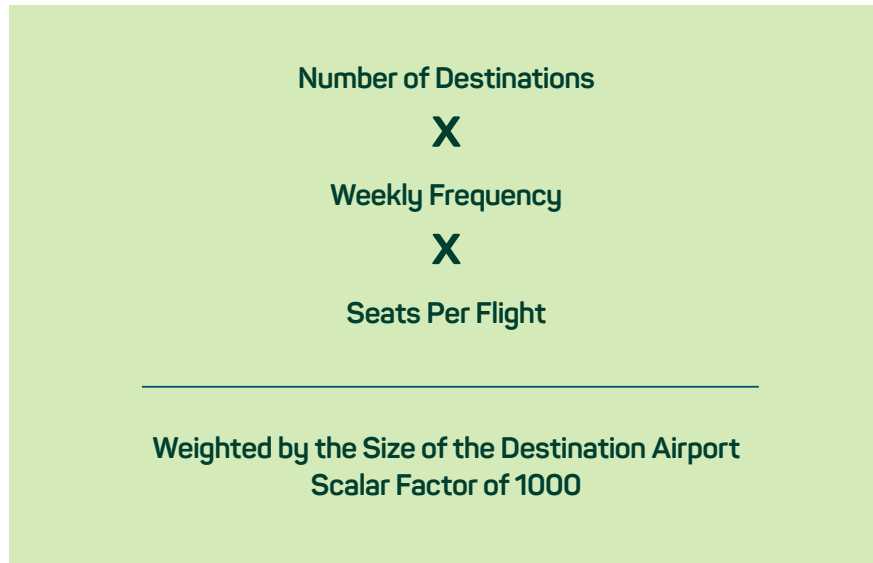
and size (in terms of passenger air traffic) of destinations served, as well as the frequency of service to each destination and the number of onward connections available from those destinations. Thus, the index recognises that connections to major global gateways provide greater global connectivity than connections to the same number of spoke ends. For example, direct service to 40 small regional destinations does not have the same importance as direct connections to 40 major global markets.

The IATA index is calculated from airline schedule data for passenger services and is based on both domestic and international services. The connectivity index measures the number of frequencies and available seats to a particular destination. It then weights the number of available seats by the size of the destination airport (in terms of number of passengers handled in each year). This weighting reflects both the size and economic importance of the destination and the potential for convenient onward connections.

For example, in 2018, Atlanta airport was the world's largest airport, and so was given a weighting of one. London Heathrow, which handles 74.6% of the number of passengers handled by Atlanta, was given a weighting of 0.746. Therefore, if an airport has 1,000 seats available to Atlanta it is given a weighted total of 1,000. But if it also has 1,000 seats available to London Heathrow, these are only given a weighted total of 746. The weighted totals are then summed for all destinations (and divided by a scalar factor of 1,000) to determine the connectivity indicator.



## The connectivity index



A higher figure for the connectivity indicator denotes a greater degree of access to the global air transport network. **Figure 4-7** shows the connectivity scores of European airports in 2018. The highest ranked airports are major hubs such as Heathrow, Frankfurt and Paris CDG. Dublin Airport ranks 11th in Europe, just behind Zurich and ahead of Copenhagen, Gatwick and Vienna. Dublin ranks ahead of Gatwick, despite the latter handling more passenger traffic (46.1 million vs 31.5 million at Dublin), due to Dublin's more extensive network, especially in long-haul.<sup>19</sup>

Few European airports can match Dublin Airport's connections to Ireland's established markets of Britain and the United States. For example, in 2018 Dublin Airport served more routes and operated more frequencies to Britain than either Frankfurt or Paris Charles de Gaulle and was exceeded only by Amsterdam.<sup>20</sup>

During Summer 2018, Dublin Airport had more weekly frequencies to North America than either Munich, Zurich, Madrid or Gatwick.<sup>21</sup> In addition, Dublin Airport is developing its European links and expanding into the Middle East, Africa and beyond.

<sup>19</sup>. <https://www.gatwickairport.com/business-community/about-gatwick/company-information/>.

<sup>20</sup>. Source: Diio Schedule Data for 2018.

<sup>21</sup>. Source: Diio Schedule Data for Summer 2018.



Testimonial



Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 165 fully featured services from data centers globally. Millions of customers – including the fastest-growing start-ups, largest enterprises, and leading government agencies—trust AWS to power their infrastructure, become more agile, and lower costs.

“  
**Dublin Airport,  
which offers  
services  
such as US  
Pre-Clearance  
is easily  
accessible from  
the AWS offices**”



*Amazon Web Services (AWS) has been an active member of the Irish technology community for over a decade now and Ireland's creative culture, diverse set of technical skills, and international transport links make it an ideal location for AWS' rapidly expanding business. AWS aims to hire and develop the best people from around the world, and easy access to travel is a fundamental part of this.*

*Dublin Airport, which offers services such as US Pre-Clearance, and which is easily accessible from the AWS offices, makes Dublin a central meeting point and home base for many AWS employees.*

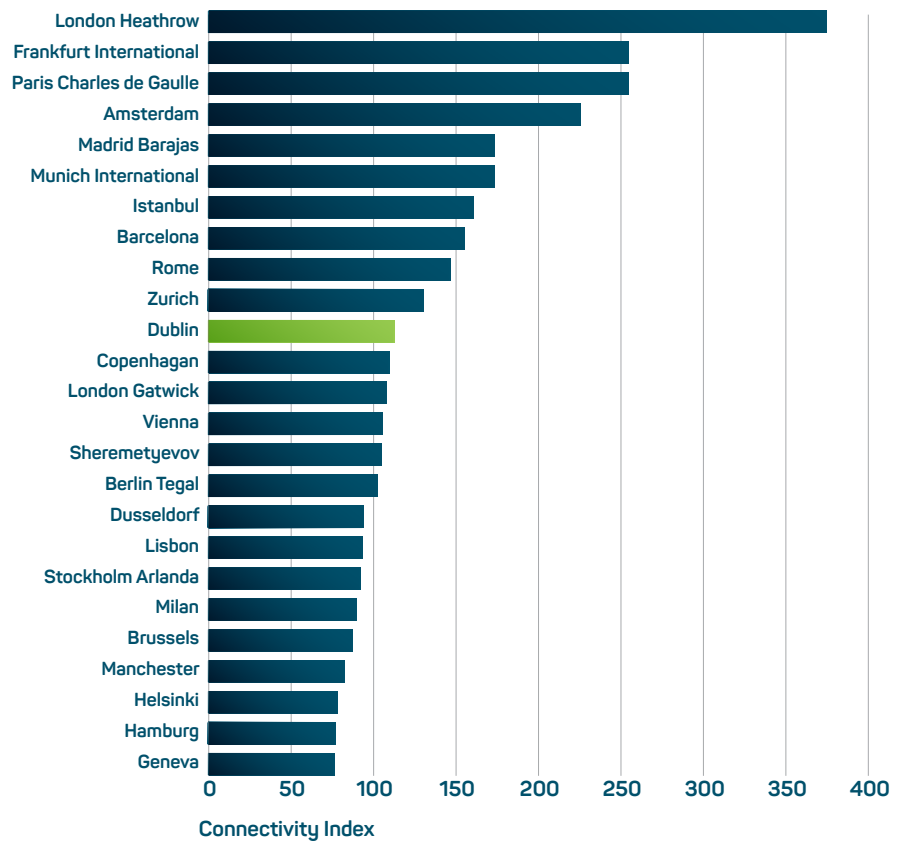


Dublin has achieved comparable levels of connectivity to Barcelona, Copenhagen, Berlin, and Vienna, cities that are arguably competitors to Dublin for tourism, trade and FDI. However, to remain competitive with or overtake these cities, Dublin Airport will need to continue to enhance its connectivity. Achieving higher connectivity will require the efforts of all airport stakeholders and will be dependent on supportive and expansive aviation policy, regulation and planning regimes to enable Dublin Airport to expand its facilities to meet demand. The pay-off will be even greater economic growth and development for Dublin and Ireland, as increased air connectivity facilitates increased trade, tourism, investment

and economic growth (as documented in Appendix B). A report by Airbus characterised Dublin as one of 55 global “mega-cities” which provide high levels of connectivity and substantial long-haul connectivity. The report highlighted that, without expansion, Dublin faced capacity constraints that would prevent the airport meeting future demand.

A comparison of connectivity scores from 2013 to 2018 is also provided for the top 25 European airports in **Figure 4-8**. Dublin Airport had a connectivity score of 71.6 in 2013, which grew by 59% to 113.6 in 2018, making it the second fastest growing airport over the last five years (after Sheremetyevo, Moscow).

**Figure 4-7:**  
**Top 25 European Airports Based on the IATA Connectivity Index (2018)**

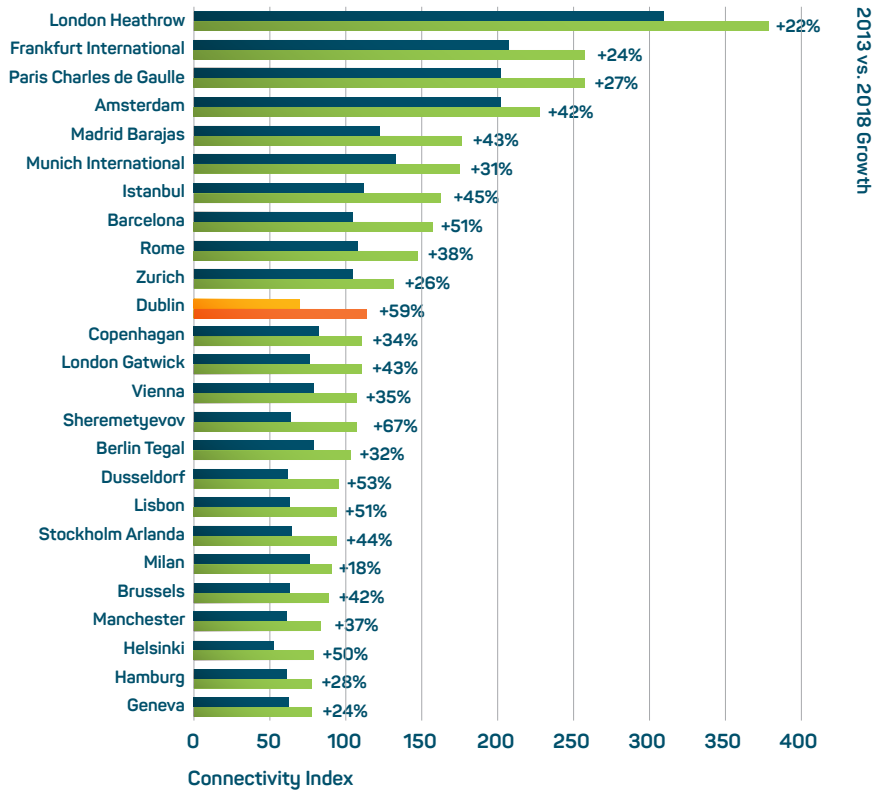


Source: Based on Diio Schedule Data 2018.

22. “Mapping Demand: Global Market Forecast 2016-35”, Airbus, <http://www.airbus.com/company/market/global-market-forecast-2016-2035/>.



**Figure 4–8:**  
**Top 25 European Airports Based on the IATA Connectivity Index (2013 vs. 2018)**



Source: Based on Diio Schedule Data 2013 and 2018.

The airports with the highest connectivity tend to be those serving relatively large populations and large economies, such as the UK, Germany and France. Dublin Airport’s contribution to connectivity is even more pronounced when compared against the size of its population or its economy. **Figure 4–9** shows national connectivity (the aggregate of the connectivity scores of all major airports in the country) divided by the country’s population, while **Figure 4–10** shows national connectivity divided by GDP. Ireland’s connectivity index includes the combined connectivity scores of Dublin, Cork, Shannon, Knock, Kerry and other airports. However, Dublin accounted for 85% of the nation’s total connectivity score in 2018.

As can be seen, Ireland has one of the highest per capita connectivity

scores in Europe among major economies, double that of the UK. Dublin Airport alone contributes higher connectivity per capita than the UK in total. With the exception of Switzerland, the most highly connected countries on a per capita basis are islands or somewhat inaccessible countries (e.g. Norway), reflecting the importance of air connectivity for these countries.

Similarly, Ireland’s connectivity per € Billion of GDP is above most other European nations, including the UK, Germany and France.

This analysis demonstrates that Dublin Airport is a major infrastructure asset for the country and a critical contributor to Ireland’s connectivity with the rest of the world. As **Chapter 5** discusses, this connectivity has important implications for the wider economy of Ireland.



## Testimonial



Kenmare Resources PLC is an established mining company based in Ireland, operating the Moma Titanium Minerals Mine, located on the north east coast of Mozambique. Kenmare's products are key raw materials processed into intermediate products and ultimately consumed in everyday "quality-of-life" products such as paints, plastics and ceramic tiles.

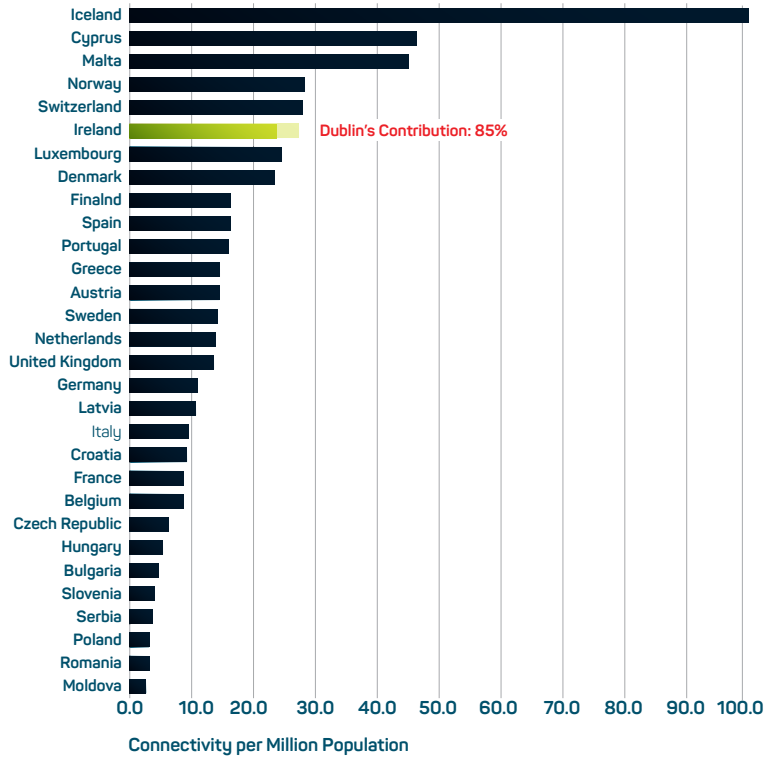
“  
**We rely on  
Dublin Airport as  
a hub to facilitate  
connecting flights  
and international  
transfers”**



*Dublin Airport is a connection to the rest of the world, and as an Irish business with international operations, we cannot overstate its importance. We rely on Dublin Airport as a hub to facilitate connecting flights and international transfers. Early morning flights play an essential role in providing more flexibility to Kenmare, opening up the range of international connecting flights we can avail of.*

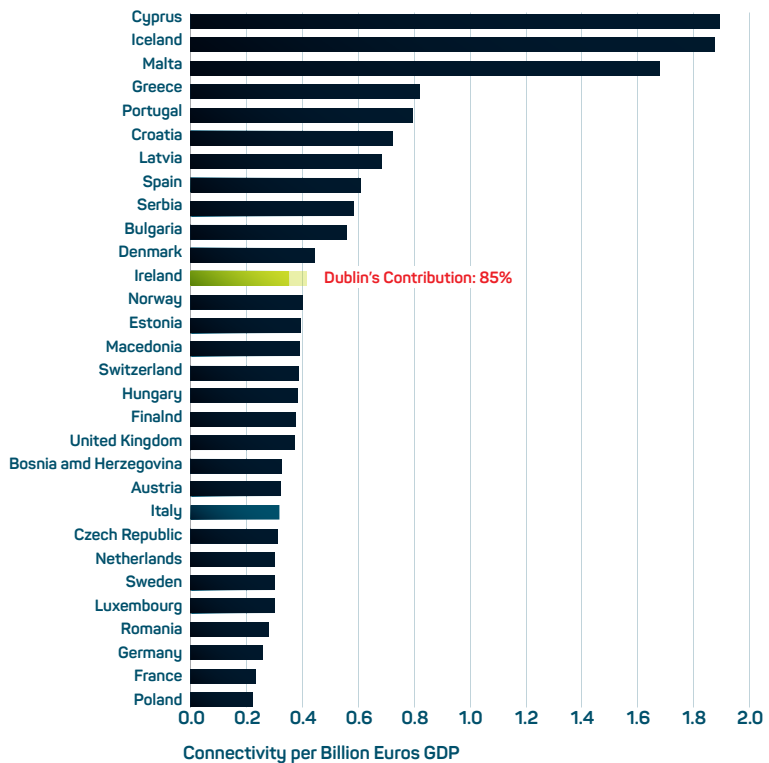


**Figure 4-9:**  
**Connectivity Relative to GDP (2018) – Top 25 Countries**



Source: Based on Diio Schedule Data and World Bank Data for 2018.

**Figure 4-10:**  
**Connectivity Relative to GDP (2018) – Top 25 Countries**



Source: Based on Diio Schedule Data and World Bank Data for 2018.

5.0

# Current Economic Contribution of Dublin Airport



Contribution from  
Dublin Airport

## Key Points

- > Dublin Airport contributes to the **employment of 129,700 people** (114,900 FTEs) in the Republic of Ireland.
- > Dublin Airport also contributes a total of **€9.8 billion in GVA**, equivalent to 3.1% of national GDP in 2018.
- > The airport **spends** an average of **€218 million per annum** with 1,981 Irish vendors (€909.9m since the start of 2015).





# 5.1

## Direct, Indirect and Induced Impacts

This chapter provides a summary of the 2018 economic impact of Dublin Airport, including the direct, indirect, induced and catalytic impacts, based on the methodology described in Chapter 3.

As described previously, the economic impact of Dublin Airport includes the direct impacts related to ongoing operations at Dublin Airport (including daa, airlines, air traffic control, ground handlers, airport security, immigration, customs, airport retail, etc.), as well as indirect impacts in businesses that supply the goods and services to the direct activities linked to the airport, and induced impacts resulting from direct and indirect employees spending their wages in the general economy.

**As noted previously, economic impact can be measured in a number of ways:**

- > **Employment** – the number of people employed by businesses involved in activities linked to Dublin Airport. This is measured in terms of jobs and full-time equivalents (FTEs), the latter of which allows for the fact that some jobs are not full-time (i.e. part-time or seasonal jobs are weighted less than full-time jobs).
- > **Income/Wages** – the wages and salaries earned by the people employed in activities linked to Dublin Airport.

- > **Gross Value Added (GVA)** – GVA is broadly equivalent to Gross Domestic Product (GDP), whereby the value-added of each industry sums to the total GDP of an economy.

The estimated economic impact of Dublin Airport in 2018 is summarised in **Figure 5-1**. Direct employment supported by ongoing operations at Dublin Airport amounts to 21,500 jobs. Adjusting for part-time and seasonal employment, this amounts to 19,200 Full-Time Equivalent jobs (FTEs). The total direct GVA generated by Dublin Airport is estimated to be nearly €1.8 billion.

**Testimonial**

From humble beginnings in 1972, as a dairy cooperative in the south west of Ireland, Kerry Group has grown to become the world's leading taste and nutrition company, serving the food, beverage and pharmaceutical industries and a leading consumer foods processor and supplier in selected EU markets. With customers in over 140 countries worldwide, Kerry has grown to become a highly successful public company, employing over 25,000 people worldwide.

“  
**Our Global  
Technology  
and Innovation  
Centre in Naas,  
was selected in  
part for its  
proximity to  
Dublin Airport**”







*Kerry Group is a leader in global food ingredients, bringing technology leadership and sustainable growth to the food and beverage industries.*

*The location of our Global Technology and Innovation Centre in Naas was selected, in part, for its proximity to Dublin Airport, which serves to connect our people and customers worldwide. Continued investment in Dublin Airport benefits Ireland's export industry and companies like Kerry Group, supporting Ireland's position as a hub for sharing ideas, innovation and expertise globally.*



**Figure 5-1:**  
**Total Economic Impact of Dublin Airport (2018)**

Impact	Number of Jobs	Full-Time Equivalents (FTEs)	Income (€ Millions)	GVA (€ Millions)
				
<b>Direct</b>	21,500	19,200	€879	€1,777
<b>Indirect</b>	12,500	11,100	€516	€985
<b>Induced</b>	15,000	13,300	€521	€1,045
<b>Total</b>	<b>49,000</b>	<b>43,600</b>	<b>€1,916</b>	<b>€3,807</b>

Updated figures based on 2018 traffic level. All financial figures are in 2018 prices. Numbers may not add up due to rounding.

Adding in multiplier impacts (indirect and induced), the total employment supported by activities at Dublin Airport is estimated to be 49,000 jobs (or 43,600 FTEs), earning a total of €1.9 billion and generating GVA of €3.8 billion.

As documented in **Chapter 2**, the economic impact of Dublin Airport has been updated by modeling its development based on traffic growth. These numbers have been further validated by comparing the direct employment estimate against data provided by daa on the aggregate number of permanent Airport Identification Cards issued by Dublin Airport. These cards are issued to persons working in restricted areas of the airport, so capture a large proportion of the employment at the airport. The number of cards issued are not fully comparable with the direct employment as not all jobs require access to restricted areas, and the volume of cards can be impacted by the turnover of jobs. Nevertheless, the data provides a guide to the overall trend in employment.

The available data from daa showed that the number of cards issued in 2012 was 11,644 and this increased to 18,469 in 2018, a compound growth rate of 7.0% per annum over six years. By comparison, direct employment in the economic impact study has increased from 15,700 jobs in 2013 to 21,500 jobs in 2018, an average compound growth rate of 6.5% over five years. This suggests a lower growth in off-airport employment. However, the growth rates are broadly similar, which further validates the scale of employment and economic impact estimated for Dublin Airport in 2018.

The scale and diversity of the businesses impacted by spending at Dublin Airport is illustrated in **Figure 5-2**, which shows the spending by Dublin Airport on Irish vendors since 2015. The airport has spent a total of €909.9 million since the start of 2015 with 1,981 Irish vendors, an average of €218 million per annum. Note that this is only spending of Dublin Airport itself and does not include spending by other businesses based at the airport (airlines, ground handlers, government agencies, etc.).

**Figure 5-2:**  
**Dublin Airport Spending on Irish Vendors, 2015-2018**

	Total Spend on Irish Vendors	Number of Vendors
		
<b>2015</b>	€189.1 Million	1,114
<b>2016</b>	€184.5 Million	1,054
<b>2017</b>	€239.5 Million	1,087
<b>2018</b>	€207.1 Million	1,042
<b>2019</b> (to 30th April 2019)	€89.7 Million	711
<b>Total</b> (2015 to 30th April 2019)	<b>€ 909.9 Million</b>	<b>1,981</b>

Source: daa





## Testimonial



The Keoghs have been farming potatoes in north county Dublin for more than 200 years. In 2011, in a diversification of its core business, Keogh's Crisps was established and is based around the family's 400-acre farm.

“

**We have been able to invite international buyers to our farm from over 20 countries in the past 5 years due to Dublin Airports proximity to our business”**

“

*Greater connectivity has allowed Keogh's Crisps to reach new export markets including US, UAE and China.*

*Having our product displayed in Dublin Airport has also enabled Keogh's to increase brand recognition outside of Ireland (especially in the U.S.). We have been able to invite international buyers to our farm from over 20 countries in the past 5 years due to Dublin Airports proximity to our business and its recognition as a European Hub airport; we are able to air freight samples & cargo to each of our international customers in over 18 markets worldwide which has enabled us to participate in New Product Tenders and win new business.*

”

# 5.2

## Catalytic Impacts

The catalytic impacts capture the way in which Dublin Airport facilitates the business of other sectors of the economy.

This includes facilitating tourism, trade, investment and productivity growth, which ultimately leads to employment growth and economic development. Appendix B summarises general research demonstrating the linkage between aviation connectivity and trade, investment, productivity and economic growth.

To illustrate Dublin Airport's contribution to the national economy, analysis was conducted of the relationship between connectivity at the airport and tourism, trade and economic growth.

### Tourism

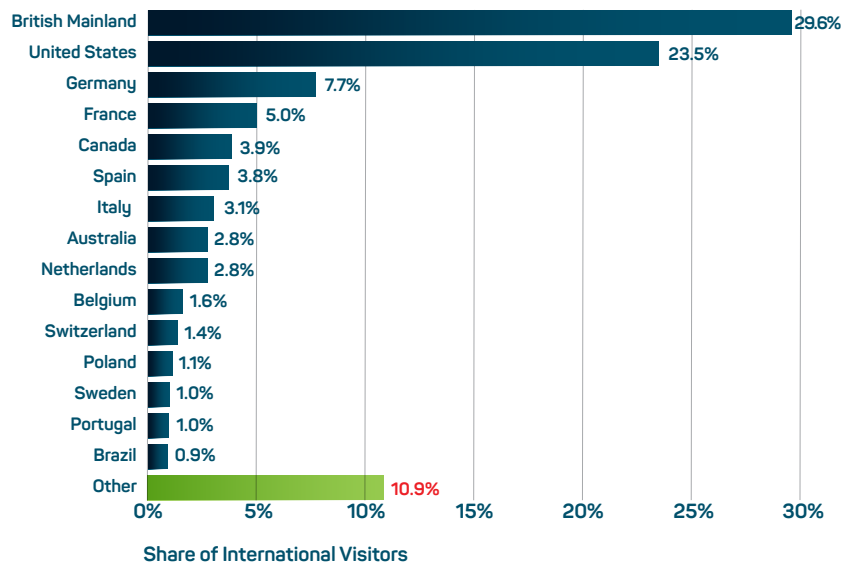
Out of the 31.5 million passengers to/from Dublin Airport in 2018, it is estimated that 13.4 million were overseas visitors to Ireland (the remaining 16.8 million were transfer passengers and residents of Northern

Ireland and the Republic of Ireland).<sup>23</sup> This means that Dublin Airport facilitated approximately 70% of overseas visits to Ireland in 2018.<sup>24</sup>

The wide range of visitors through Dublin Airport is shown in **Figure 5-3**. Visitors from the British mainland accounted for 30% of international visitors through Dublin Airport, while U.S. residents accounted for 24%. Visitors from mainland Europe accounted for approximately 35% in total. Other prominent countries include Canada, Australia and Brazil.

Each visitor through Dublin Airport spends money in the Irish economy on hotels, retail, restaurants, transportation, entertainment, etc. This injection of spending generates jobs and GVA for the Irish economy.

**Figure 5-3:**  
**Origin of International Passenger Arrivals at Dublin Airport, 2018**



Source: daa

23. Source: daa.

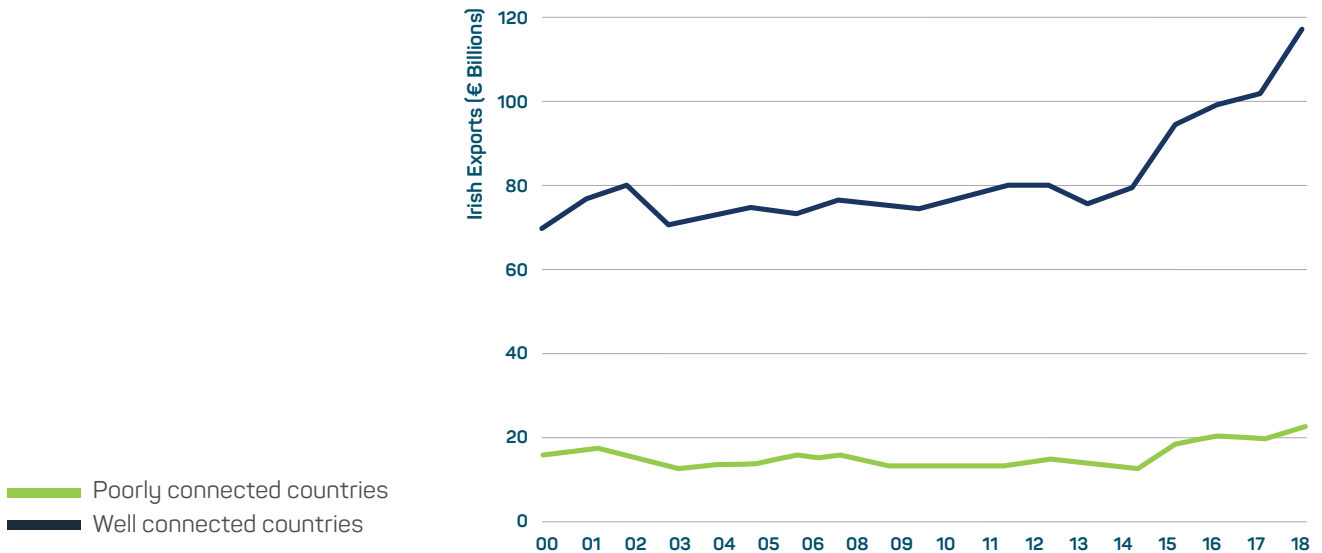
24. Source: Tourism Ireland. There were 9.6 million overseas visitors to Ireland in 2018. Dividing the 13.4 million overseas passenger by two (the same visitor arrives and departs the airport), the estimated overseas visitors through Dublin Airport is 6.7 million (70% of 9.6 million).

**Trade**

The relationship between the connectivity of Dublin Airport and Ireland’s export trade is illustrated in **Figure 5-4**. It shows the value of merchandise exports (i.e. goods) from Ireland to countries with frequent air service from Dublin (at least five times per week on a year-round basis) and to those countries with limited or no frequencies from Dublin. The value

of exports with the well-connected countries is five to six times that of trade with poorly connected countries. While air connectivity alone cannot create trade, it is a necessary requirement for trade development. Poor air connectivity to a country will hinder the ability to develop business contracts, service clients and to compete with businesses in better connected countries.

**Figure 5-4:**  
Ireland’s Exports and Direct Air Services from Dublin Airport, 2000-2018



Source: Diio Schedule Data and Central Statistics Office Ireland.



Testimonial



Kingspan is the global leader in high performance insulation and building envelope solutions and in 2018 reported record revenues of €4.4bn. Its goal is to improve building performance, construction methods and ultimately people's lives. The company employs over 14,000 staff in 70 countries and is headquartered in Kingscourt County Cavan.

“  
employing over  
14,000 staff  
across 5  
continents,  
connectivity is  
the life blood of  
our business”



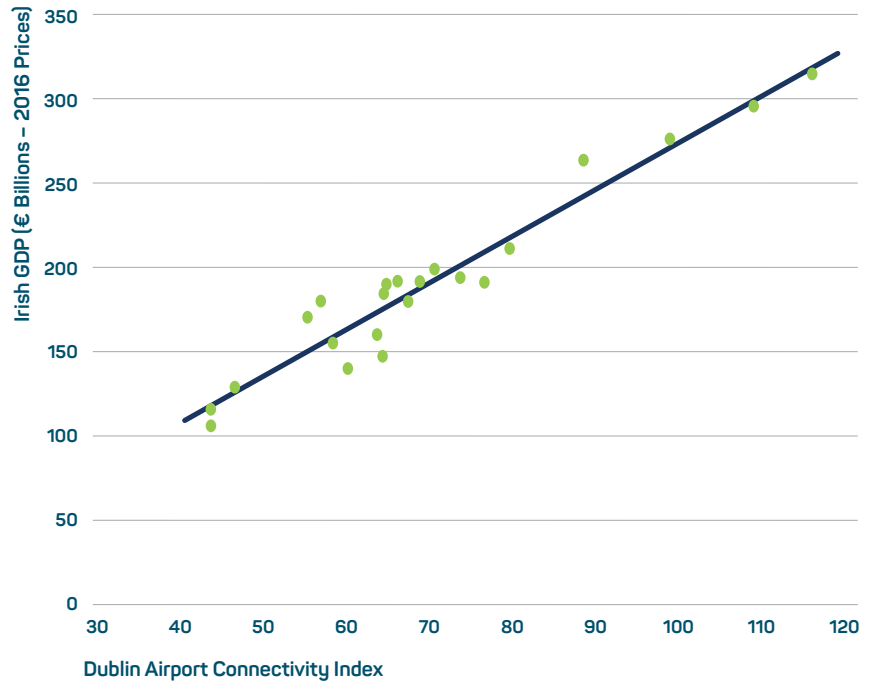
*As a global company with local roots, employing over 14,000 staff across 5 continents, connectivity is the life blood of our business. Despite advances in technology, personal engagement with our customers and our global team often requires same-day travel and that is only possible with early departures and late evening returns. That flexibility has become so crucial to our business that we now lease an office at Dublin Airport for the convenience of our global staff and customer base.*





Figure 5-5 shows the relationship between Dublin Airport's connectivity (using the IATA connectivity index) and national GDP. It shows a clear and a fairly strong relationship between connectivity and GDP over time, consistent with findings in other research.

**Figure 5-5:**  
**National GDP and Dublin Airport Connectivity, 1997-2018**







Source: Diio Schedule Data and Central Statistics Office Ireland.

The plots presented are indicative of the underlying relationship between Dublin Airport’s connectivity and economic development. More detailed analysis would be required to control for other factors affecting the economic indicators (e.g. government policy, general economic environment etc.) and to establish the nature of the causal relationship between connectivity and the economic indicators. For example, air connectivity alone cannot create trade – a new air service to a country will not guarantee a surge in trade with that country. That said, it is also the case that poor air connectivity to a country will hinder the ability to develop business contracts, service clients and to compete with businesses in better connected countries. As described in [Section 3.2](#),

use has been made of the results from a larger European study in order to estimate the catalytic impact of Dublin Airport, which are presented below.

The employment, income and GDP associated with the catalytic impacts of Dublin Airport are based on the previous economic impact study, updated to reflect 2018 traffic levels. These are presented in [Figure 5–6](#). It is estimated that a total of 80,700 jobs are associated with the catalytic impacts of Dublin Airport, earning €3.1 billion in income and wages. The catalytic impacts of Dublin Airport facilitated nearly €6.0 billion in GDP.

**Figure 5–6:**  
**The Catalytic Impacts of Dublin Airport (2018)**

Impact	Number of Jobs	Full-Time Equivalents (FTEs)	Income (€ Millions)	GVA (€ Millions)
				
<b>Direct</b>	80,700	71,300	€3,057	€5,994

Updated figures based on 2018 traffic levels. All financial figures are in 2018 prices. Numbers may not add up due to rounding.

# 5.3






## Total Impacts

The total economic impact of Dublin Airport – activity directly related to the airport, the multiplier impacts that flow from that, and the other sectors of the economy facilitated by the airport (the catalytic impacts) – are shown in **Figure 5–7**. Dublin Airport contributes to the employment of 129,700 people in the Republic of Ireland, equivalent to 114,900 full-time jobs, earning a total of nearly €5.0 billion. Furthermore, a total of €9.8 billion is contributed to GDP, an amount equal to 3.1% of the national economy.<sup>25</sup>

While these figures are substantial, it is worth considering how Ireland’s economy might look if the country did not have a hub airport of the size of Dublin Airport offering the scope of air services currently provided.

At the most extreme, Ireland could have no commercial airports, instead relying on sea access to airports in the UK, or Dublin could have smaller regional airports acting as spokes for other hubs in the UK and the rest of Europe, so that passengers would have to travel via these hubs to get to many parts of the world. In such scenarios, it is easy to imagine that tourism to Ireland would be much lower, that Dublin would not be able to attract as many carriers to operate services (or to have aircraft maintained and repaired in Ireland), that the overall volume of trade would be substantially lower, and that some companies would choose not to locate or expand in Ireland. The net effect of this would be a smaller, slower-growing economy.

**Figure 5–7:**  
**Total Economic Impact Generated and Facilitated by Dublin Airport (2018)**

Impact	Number of Jobs	Full-Time Equivalents (FTEs)	Income (€ Millions)	GVA (€ Millions)	GVA as % of National GDP
					
<b>Direct</b>	21,500	19,200	€879	€1,777	0.6%
<b>Indirect</b>	12,500	11,100	€516	€985	0.3%
<b>Induced</b>	15,000	13,300	€521	€1,045	0.3%
<b>Catalytic</b>	80,700	71,300	€3,057	€5,994	1.9%
<b>Total</b>	<b>129,700</b>	<b>114,900</b>	<b>€4,973</b>	<b>€9,801</b>	<b>3.1%</b>

Updated figures based on 2018 traffic level. All financial figures are in 2018 prices. Numbers may not add up due to rounding.

<sup>25</sup> Based on CSO estimates of 2018 GDP: <https://www.cso.ie/en/releasesandpublications/er/na/quarterlynationalaccountsquarter42018/>, 14 March 2018. The CSO increased Ireland’s GDP by 26.3% in 2015 due to a number of one-off factors such as corporate inversion deals (companies moving residence to Ireland), transfer of patents and relocation of aircraft leasing assets. As a result of this financial inflation of the GDP figures, Dublin Airport’s contribution to national GDP is now 3.1% rather than 4.0% reported in the 2015 economic impact report. This reduced percentage does not mean that Dublin Airport’s contribution to the real economy has declined – without the 2015 adjustment to the GDP figures, Dublin Airport’s percentage contribution to GDP would have maintained.

**Testimonial**

DCU is a young, dynamic and ambitious university with a distinctive mission to transform lives and societies through education, research and innovation. DCU is Ireland's most innovative university and delivers programmes to thousands of students across its five faculties – Humanities and Social Sciences, Science and Health, Engineering and Computing, DCU Business School and the DCU Institute of Education. DCU's excellence is recognised internationally and it is regularly featured among the world's top young universities.

“

**The university welcomes thousands of international visitors to our three north Dublin campuses each year”**



*The proximity of Dublin Airport to Dublin City University offers significant benefits to our work in a number of ways. The university welcomes thousands of international visitors to our three north Dublin campuses each year, including visiting professors, students and researchers, attendees at global conferences and events, and students attending short-term English language courses.*

*The airport also offers important employment opportunities for our graduates and DCU offers degree programmes in Aviation at both undergraduate and postgraduate levels. We are pleased to cooperate with daa and Dublin Airport Central in areas of education, training and research. Ease of access to an international airport is critical to these activities. The airport's proximity is also beneficial to our staff, as DCU continues the development of its global reach, through partnerships with universities in the United States, Middle East and Southeast Asia, in particular.*







# 5.4

## Impacts by Region

The 2015 economic impact study of Dublin Airport analysed the location of the jobs and economic activity generated by the airport across Ireland (based on the location of businesses where the employment takes place). This research has been used to estimate the distribution of jobs and GVA in 2018, based on the estimated 2018 totals. The estimated impacts by regions are provided in **Figure 5–8**. With the airport based in Fingal, 89% of the direct impact (19,100 jobs out of 21,500) is generated in Fingal. A further 8% is generated in the rest

of Dublin and the remaining 3% in Leinster and the rest of Ireland. The multiplier and catalytic impacts are much more widely distributed, reflecting the airport's contribution to the entire Irish economy. Approximately 26% of total employment and 28% of total GVA is located in Fingal, a further 22% of employment and 25% of GVA is located in the rest of Dublin, 21% of employment and 19% of GVA is located in the Rest of Leinster, and 30% of employment and 27% of GVA are located in the Rest of Ireland.

**Figure 5–8:**  
**The Economic Impact of Dublin Airport by Region (2018)**

Region	Direct	Indirect	Induced	Catalytic	Total	% Share of Total
<b>Employment (Jobs)</b>						
						
Dublin Airport/ Fingal	19,100	4,000	3,000	7,500	33,600	26%
Rest of Dublin	1,700	4,800	4,800	17,900	29,200	23%
Rest of Leinster	100	2,100	3,300	22,300	27,800	21%
Rest of Ireland	600	1,600	3,900	33,000	39,100	30%
<b>Total</b>	<b>21,500</b>	<b>12,500</b>	<b>15,000</b>	<b>80,700</b>	<b>129,700</b>	<b>100%</b>
<b>GVA (€ Millions)</b>						
						
Dublin Airport/ Fingal	1,579	319	221	679	2,789	29%
Rest of Dublin	139	382	332	1,572	2,425	25%
Rest of Leinster	11	159	222	1,515	1,908	19%
Rest of Ireland	48	125	270	2,227	2,671	27%
<b>Total</b>	<b>1,777</b>	<b>985</b>	<b>1,045</b>	<b>5,994</b>	<b>9,801</b>	<b>100%</b>

Updated figures based on 2018 traffic level. All financial figures are in 2018 prices. Numbers may not add up due to rounding.



## Testimonial



**Fingal Dublin  
Chamber**  
Advancing business together

Fingal Dublin Chamber of Commerce is the accredited Chamber for the entire Fingal Region. The Chamber delivers value to members through a variety of opportunities to network, connect and engage.

As the region's largest business organisation, it provides advice, support, referrals and representation to help businesses to grow and develop.

“

**The connectivity afforded to this region is of immense importance when our member companies wish to conduct business overseas”**



*The economic benefit of Dublin Airport to not only Fingal but also to the Greater Dublin Region and to Ireland as a whole cannot be stressed enough.*

*From discussions with our wider membership of almost 500 companies from major Multi Nationals to our indigenous SME's they will all bear testimony to Dublin Airports importance not only to them individually but to the Greater Fingal Region. The connectivity afforded to this region is of immense importance when our member companies wish to conduct business overseas and in Ireland.*

*Fingal is arguably the most industry diverse region in Ireland with large companies operating in the Pharmaceutical, Technology, Tourism (both incoming and outgoing) and Agri sectors and all will confirm the importance of Dublin Airport to its ongoing trading success.*



# Appendix A: Further Information on the Input-Output Tables and the Economic Multipliers

As described in **Chapter 3**, the economic impact multipliers (indirect and induced) impacts were based on an Input-Output (I-O) model of the economy of the Republic of Ireland maintained by the Central Statistics Office Ireland.

The I-O model output was used to estimate the direct, indirect and induced economic effects in this study. This approach has been

widely accepted as the most comprehensive approach for the study of economic impact.

### The Input-Output Model

The I-O model of an economy links the gross output of an industry to the final demand for that industry and to the intermediate demands made by other sectors for its output. **Figure A-1** illustrates the basic structure of the input-output model.

**Figure A-1:**  
**A Highly Simplified Input-Output Accounting Framework**

	Industries (Purchases)	Final Demand	Total Output
Industries (Sales)	Z	Y	X
Value-added (primary inputs)	V		
Total output	X		

Analytically, we have the following basic identity for sector *i*,

$$X_i = Z_{i1} + Z_{i2} + \dots + Z_{in} + Y_i, \quad i = 1, \dots, n. \quad (1)$$

#### In Figure A-1,

- > The first row characterizes the “purchasing sectors” (purchasers), while the first column captures the “selling sectors” (sellers);
- > Each data column under “Industries” represents the sales from other sectors to sector *i*; that is, sector *i*’s purchases of the products of various producing sectors in the economy. Hence the column represents the sources and magnitudes of sector *i*’s inputs.
- > On the other hand, in engaging in production, a sector also pays for other items – for example, labor and capital – and uses other inputs as well, such as inventoried items. All of these together are termed the value-added in sector *i*. In addition, imported goods may be purchased as inputs by sector *i*. All of these inputs (value added and imports) are lumped together as purchases from

what is called the payments sector (*V<sub>i</sub>* in **Figure A-1**).

**In the case of Ireland, the net final demand (Y) is the sum of the following items:**

- > Final consumption of households;
- > Government consumption expenditure;
- > Gross capital formation;
- > Change in inventory; and
- > Exports.

**For Ireland, the total value-added (V) is the sum of the following items:**

- > Imports of goods and services;
- > Operating surplus;
- > Compensation of employees;
- > Consumption of fixed capital;
- > Product and other indirect taxes less subsidies.

In other words, referring back to **Figure A-1**, each row for sector  $i=1$  to  $n$  records the sales of that sector's output to other industrial sectors in the economy plus sales to private consumers, government, capital formation, inventory and overseas purchasers. Each column for sector  $i=1$  to  $n$  records the purchases of production inputs for that sector in order to produce its total output. This includes purchases from other sectors of the economy, purchases of imports, payment for labour, payment of government taxes, and generation of profits.

### Input-Output Coefficients

Input-output table becomes an economic tool when Leontief introduced an assumption of fixed-coefficient linear production functions related to input used by a sector along each column to its output flow, i.e., for one unit of every industry's output, a fixed amount of input of each kind is required.<sup>26</sup> That is, we define the following coefficients:

$$a_{ij} = \frac{z_{ij}}{X_j}$$

This ratio is termed a technical coefficient, commonly known as input-output coefficient or direct input coefficient. With this specification of production technology, the model basically assumes that the industry shows constant returns to scale,

which is a reasonable approximation in short-run, but nevertheless is also a limitation of the model.

Once the notion of a set of fixed input-output coefficients is accepted, the system of equations (1) can be represented as follows:

$$X_i = a_{i1}X_1 + a_{i2}X_2 + \dots + a_{in}X_n + Y_i, \quad i = 1, \dots, n. \quad (2)$$

This leads to the matrix representation:

$$X = AX + Y$$

Hence, with the net final demand vector  $Y$ , we can solve for the output vector, via matrix inverse as follows:

$$X = (I - A)^{-1}Y$$

where  $I$  stands for the identity matrix. And the matrix  $(I - A)^{-1}$  is the Leontief inverse coefficients. These measure the total amount of output in each sector that is required to be produced in order to satisfy the direct and indirect demands produced by one unit increase in the final demand for a given sector (i.e., the direct + indirect multiplier). The economic interpretation of the Leontief inverse coefficients is consistent with the derivation of the Keynesian multipliers (e.g., expenditure multiplier) that are commonly used in

26. See Leontief, Wassily W. *Input-Output Economics*. 2nd ed., New York: Oxford University Press, 1986.



macroeconomics. In other words, it can be interpreted as a result of successive rounds of iterations. An important implication of this connection with the Keynesian multiplier is that the inverse coefficients capture both direct and indirect effects of the final demand from all sectors identified in the I-O table. In practice the multipliers from I-O tables are usually expressed in values so that coefficients measure the requirements in dollars on sector  $i$  when sector  $j$  increases its final demand by one dollar.

#### **Indirect and Induced Impacts – Open System and Closed System**

The economic impact multipliers are expressed as ratios that measure the impact on the total economy as a result of an initial autonomous change in any of the final demand components. The action of the multiplier can be illustrated by the sequence of events that follow after the initial autonomous change. Different kinds of multiplier can be generated depending on the purpose of analysis. The common multipliers used are output, valued-added, employment, and income multipliers. For comparative purposes, multipliers use usually expressed with respect to a unit of autonomous change in final demand.

#### **Open Model: Direct and Indirect Impacts**

Each of the multipliers listed above can be generated from two different models: open and closed. The intrinsic difference between them is the treatment of household income as personal consumption expenditure. In the open model, all final demand components are assumed to be exogenous. Hence the open model

captures the production-induced effects resulting from a change in final demand. The multipliers generated using the open model are also known as simple multipliers or Leontief multipliers. This kind of model is described as open because at each round of the multiplier process, there is leakage from the system. The leakage consists of payments for imports and primary inputs and the recipients are assumed to make no use of their receipts. Even if a small part of the receipts were spent on goods and services, there would be further multiplier repercussions. In our analysis, Leontief multipliers capture the direct and indirect effects of an autonomous change in final demand.

#### **Closed Model: Direct, Indirect and Induced Impacts**

Conversely, in the closed model, the household sector is treated as endogenous to the system. The household sector receiving income from the work done in the production process would spend some of this income on local products. This increase in consumption would in turn increase the level of output of the products. In other words, the closed model accounts for both the production-induced effects as well as the consumption-induced effects. The multipliers generated using the closed model are commonly known as the total multipliers or Leontief-Keynes multipliers. In our analysis, Leontief-Keynes multipliers will capture the direct, the indirect AND the induced effects. The total multiplier from the closed model is by definition larger than the simple multiplier from open model. The difference between the two multipliers is the induced impact.

## Appendix B: Overview of Catalytic Impacts

As discussed in **Chapter 2**, catalytic impacts capture the way in which aviation facilitates the business of other sectors of the economy. This comprises:

- > **Tourism** – air service facilitates the arrival of larger numbers of tourists to a country. This includes business as well as leisure tourists. The spending of these tourists can support a wide range of tourism-related businesses: hotels, restaurants, entertainment and recreation, car rentals, and others.
- > **Trade** – air transport provides connections to export markets for both goods and services.
- > **Investment** – a key factor many companies take into account when making decisions about the location of offices, manufacturing plants or warehouses is the proximity of an international airport.

- > **Productivity** – air transportation offers access to new markets which in turn enables businesses to achieve greater economies of scale. Air access also enables companies to attract and retain high quality employees.

A number of studies have demonstrated that air transportation plays an important role in trade, investment and business location decisions, while additional studies have uncovered empirical evidence demonstrating a strong linkage between air service and employment and economic growth. Provided below is a summary of this research examining the catalytic impact of aviation, taken from academic and industry research.

### Trade

**A number of research papers have produced evidence that aviation positively contributes to the trade of both goods and services**

Paper	Methodology	Key Findings
<b>Cech (2004)<sup>27</sup></b>	Used a cross-section statistical comparison method to investigate how air cargo services affect the economies of 125 U.S. countries.	Higher levels of air cargo services contribute to increased earnings and increased employment.
<b>EUROCONTROL (2005)<sup>28</sup></b>	The study estimated the net contribution of air transportation to trade (i.e., export minus imports).	Net contribution of air transportation to trade was €55.7 billion in 2003 across the 25 current EU members.

27. See Leonti Cech P. (2004), "The Catalytic Effect of the Accessibility to Air Cargo Services", TIACA Graduate Research Paper Competition.

28. Cooper, A. and Smith, P. (2005), "The Economic Catalytic Effects of Air Transport in Europe," Commissioned by EUROCONTROL. EUROCONTROL is a civil and military organisation established in 1963 to facilitate a safe, seamless pan-European Air Traffic Management (ATM) system.

Paper	Methodology	Key Findings
<b>UK Institute of Directors (2008)<sup>29</sup></b>	Surveyed 500 UK businesses about their use and the importance of air transportation.	The use of air travel strongly linked to business trade and sales. Almost three quarters of businesses using passenger air services said that their business would be adversely affected if the amount of air travel they could undertake was significantly curtailed.
<b>Poole (2010)<sup>30</sup></b>	Econometric analysis of U.S. trade and travel data from 1993 to 2013.	A 10% increase in business travel to the U.S. by non-residents led to a 1.2% increase in the volume of exports from the U.S. and 0.3% increase in export margins. The effect was strongest for travel from non-English speaking countries, suggesting that business travel help overcome language barriers in trade relationships.
<b>PWC (2013)<sup>31</sup></b>	Examined the relationship between the UK's international air seat capacity and international trade, controlling for other factors affecting trade.	A 10% increase in seat capacity increased goods exports by 3.3% and goods imports by 1.7%.

### Investment and Business Location

The impact of aviation on investment and business location decisions has been the subject of a number of papers. These papers have found evidence of air connectivity contributing to increased investment and beneficial location decision for the surrounding regions or the country.

29. UK Institute of Directors (2008), "High Fliers: Business Leaders' View on Air Travel", [http://www.iod.com/MainWebSite/Resources/Document/policy\\_paper\\_high\\_fliers.pdf](http://www.iod.com/MainWebSite/Resources/Document/policy_paper_high_fliers.pdf)

30. Poole, J. (2010), "Business Travel as an Input to International Trade", <http://www.scu.edu/business/economics/upload/Poole.pdf>

31. PWC (2013), "Econometric Analysis to Develop Evidence on the Links Between Aviation and the Economy", Report for the UK Airports Commission, December 2013.

Paper	Methodology	Key Findings
<b>Hansen and Gerstein (1991)<sup>32</sup></b>	Used data from 1982 to 1987, the analysis related the amount of Japanese investment in each US state to measures of level of air service operated between Japan and that state (and other background factors).	The amount of Japanese investment in each US state was causally linked to the air service between Japan and that state.
<b>EUROCONTROL (2005)<sup>33</sup></b>	Analysed the relationship between air transportation and business investment in the EU.	A 10% increase in air transportation usage increases business investment by 1.6% in the long run (the impact takes approximately five years to fully manifest).
<b>IATA (2005)<sup>34</sup></b>	IATA surveyed 625 businesses in five countries (China, Chile, United States, Czech Republic and France).	25% of surveyed businesses in five countries indicated that 25% of their sales were dependent on good air transport links; 30% of Chinese firms reported that they had changed investment decisions because of constraints on air services.
<b>Bel and Fageda (2008)<sup>35</sup></b>	Statistically analysed the relationship between international air service and the location of large firm's headquarters across major European urban areas.	A 10% increase in supply of intercontinental air service was associated with a 4% increase in the number of large firm headquarters located in the corresponding urban area.

**32.** Hansen, M. and R. Gerstein "Capital in Flight: Japanese Investment and Japanese Air Service in the United States During the 1980s," *Logistics and Transportation Review*, 1991, Vol. 27, No. 3, pp. 257-276.

**33.** Cooper, A. and Smith, P. (2005), "The Economic Catalytic Effects of Air Transport in 34.Europe," Commissioned by EUROCONTROL. EUROCONTROL is a civil and military organisation established in 1963 to facilitate a safe, seamless pan-European Air Traffic Management (ATM) system.

**34.** *Airline Network Benefits*, IATA Economic Briefing No. 3, 2006.

**35.** Bel, G. and Fageda, X. (2008), "Getting There Fast: Globalization, Intercontinental Flights and Location of Headquarters", *Journal of Economic Geography*, Vol. 8, No. 4.



Paper	Methodology	Key Findings
<b>Arndt et al. (2009)<sup>36</sup></b>	Survey of 100 foreign-owned businesses in Germany.	Air connectivity was one of the four most important factors affecting location decisions, and that 57% of businesses would have chosen another location had connectivity been less good.
<b>PWC (2013)<sup>37</sup></b>	Econometric analysis of the UK's air connectivity, air seat capacity and Foreign Direct Investment (FDI).	A 1% increase in international seat capacity was associated with a 0.47% increase in FDI inflows and a 0.19% increase in FDI outflows.

**Impact on Employment, Economic Growth and Productivity**

The increased trade, investment, business activity and tourism facilitated by aviation ultimately results in increases in economic productivity (e.g., GDP per worker), in GDP and in employment (e.g., increased trade facilitated by air services

results in increased employment in the businesses producing the traded goods and services). A number of research papers have examined the overall impact on the economy and employment as a result of the catalytic effects of aviation.

Paper	Methodology	Key Findings
<b>Button, Lall, Stough and Trice (1999)<sup>38</sup></b>	Used data from 321 US metropolitan areas in 1994 to regress high-tech employment against a number of controlling factors including a dummy indicating that the region was served by a hub airport.	The analysis found that the presence of a hub airport increased high-tech employment by an average of 12,000 jobs in a region.

36. Arndt, A., et al. "Economic catalytic impacts of air transport in Germany–The influence of connectivity by air on regional economic development." ATRS Conference. 2009.

37. PWC (2013), "Econometric Analysis to Develop Evidence on the Links Between Aviation and the Economy", Report for the UK Airports Commission, December 2013.

38. Button, K., Lall, S., Stough, R. and Trice, M. (1999), "High-technology employment and hub airports," Journal of Air Transport Management, Vol. 5, Issue 1, January 1999.

Paper	Methodology	Key Findings
<b>Button and Taylor (2000)</b> <sup>39</sup>	Used data for 41 metropolitan areas in the US to regress “new economy” employment against a number of control factors including the number of direct routes to Europe offered by airports in the region.	Increasing the number of routes between the US and Europe from 3 to 4 at an airport generated approximately 2,900 “new economy” jobs in the surrounding region.
<b>Brueckner (2002)</b> <sup>40</sup>	Regressed employment in 94 metropolitan areas in the US against a number of factors including measures of air service.	A 10 percent increase in passenger enplanements in a metropolitan area leads to an approximately 1 percent increase in employment in service-related industries.
<b>Ishutkina and Hansman (2009)</b> <sup>41</sup>	Aggregate and individual country-level data were analysed in terms of the relationship between air transportation passengers and GDP. A data analysis of 139 countries over a time period of 30 years (1975 to 2005).	Found statistical evidence of a (two-way) feedback relationship between air transport and economic activity.
<b>PWC (2013)</b> <sup>42</sup>	Estimated an Error Correction Model of UK GDP and air seat capacity between 1991 and 2010.	A 10% change in the growth rate of seat capacity leads to approximately a 1% change in the growth rate of GDP. The analysis also found evidence of a two-way relationship between the variables – GDP growth causes seat capacity and seat growth causes GDP growth.
<b>ACI Europe/ InterVISTAS (2015)</b>	Analysed the relationship between national air connectivity and GDP per capita using data for 40 European countries between 2000 and 2012.	This recently completed analysis found that a 10% increase in connectivity was associated with an increase in GDP per capita of 0.6%. Additional analysis found evidence that this relationship was two-way.

39. Button, K. and Taylor, S. (2000), “International air transportation and economic development”, *Journal of Air Transport Management*, Vol. 6, Issue 4, October 2000.

40. Brueckner, J. (2002), “Airline Traffic and Urban Economic Development”.

41. Ishutkina M.A. and Hasnman R.J. (2009), “Analysis of the interaction between air transportation and economic activity: a worldwide perspective”, PhD thesis, Department of Aeronautics and Astronautics, Massachusetts Institute of Technology.

42. PWC (2013), “Econometric Analysis to Develop Evidence on the Links Between Aviation and the Economy”, Report for the UK Airports Commission, December 2013.

Paper	Methodology	Key Findings
		That is, as an economy grows, it supports a larger air transport sector, but it appears to also be the case that growth in air transport supports economic growth.
<b>Baker, Merkert and Kamruzzaman (2015)<sup>43</sup></b>	Analysed 88 regional airports in Australia over a period of 1985–86 to 2010–11 to determine the catalytic impacts of regional air transport on regional economic growth.	A significant bi-directional relationship was established: airports have an impact on regional economic growth and the economy directly impacts regional air transport.

**Conclusions**

A body of research has developed over the last 30 years which has examined and quantified the contribution of air transport to trade, investment and economic growth. Through the use of different empirical methods and data sets, this research has consistently found a significant and positive

relationship between aviation and economic growth. Furthermore, much of the research has established that air transport growth has been the cause of economic growth, rather than simply economic growth leading to increased air transport levels.

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43. Baker, D., Merkett, R. and Kamruzzaman, M. (2015), "Regional aviation and economic growth: cointegration and causality analysis in Australia", *Journal of Transport Geography*, Vol. 43, February 2015, pp. 140-150.

## Glossary

**Catalytic Impacts** – Catalytic Impacts, also known as Wider Economic Benefits, captures the way in which specific economic activities facilitates further economic or business impacts in other sectors of the economy.

Air transport creates catalytic impacts primarily through increased connectivity and improves national economic performance through the following mechanisms: tourism, trade in goods and services, investment, and increased productivity.

**CSO** – Central Statistics Office, Ireland.

**daa** – State owned commercial corporation responsible for the operation and management of Dublin and Cork airports.

**Direct impacts** – Direct Impacts arise immediately from the conduct of those entities performing the activity in question. For an airport, the “direct impacts” would include the activities of airlines, the airport itself, forwarders, ground handling agents, and other firms whose principal business involves commercial aviation.

**E/D Passengers** – Enplaned/deplaned passengers. A measure of passenger volume that counts each passenger who enplanes or deplanes an aircraft.

**Economic Impact** – Economic impact is a measure of the employment, spending and economic activity associated with a business, a sector of the economy, a specific project (such as the construction of a new facility), or a change in government policy or regulation.

**FDI** – Foreign Direct Investment. Investment from one country into another (normally by companies rather than governments) that involves establishing operations or acquiring tangible assets, including stakes in other businesses.

## Terms and Abbreviations

**Wider Economic Benefits** – See Catalytic Impacts.

**FTE** – A full-time equivalent (FTE) year of employment is equivalent to the number of hours that an individual would work on a full-time basis for one year (also known as a person year). FTEs are useful because part-time and seasonal workers do not account for one full-time job.

**GDP** – Gross Domestic Product, a measure of the total output of an economy.

**GVA** – Gross Value Added (GVA) – the value of the operating surpluses of business linked to Dublin Airport, plus the income/wages of employees and consumption of fixed capital. GVA is broadly equivalent to Gross Domestic Product (GDP), whereby the value-added of each industry sums to the total GDP of an economy.

**I-O Model** – Input-Output (I-O) model. A representation of the flows of economic activity within a region or country. An I-O model captures what each business or sector must purchase from every other sector in order to produce a dollar’s worth of goods or services.

**Indirect impacts** – Indirect Impacts involve the supply chain of the businesses or entities conducting the primary activity (i.e. those included in the direct impact). For example: the airlines at an airport purchase fuel which has been refined at a plant and transported to the airport by pipe or truck; catering companies at the airport buy food from wholesalers. The items purchased can be used for many purposes besides commercial aviation and would usually occur off site. The materials support the primary aviation activity, although they could be used for many purposes.

**Multiplier Impacts** – Economic multipliers are used to infer indirect and induced effects from a particular sector of the economy. These are typically derived from an Input-Output model.

**Induced impacts** – Induced impacts capture the economic activity generated by the employees of firms directly or indirectly connected to the airport spending their income in the national economy. For example, an airline employee might spend his/her income on groceries, restaurants, child care, dental services, home renovations and other items which, in turn, generate employment in a wide range of sectors of the general economy.

**Low Cost Carrier (LCC)** – Also known as low fares, no-frills or budget carriers. These are airlines that generally have lower fares and fewer amenities than network or legacy carriers. Although there is considerable variation in the business models, low cost carriers typically operate a single aircraft type (to reduce training and maintenance costs), do not offer first or business class travel, do not provide in-flight services such as meals and entertainment (or offer them at additional charge), and focus on point-to-point travel offering limited connecting options. Examples in Europe include EasyJet, Ryanair, Wizz Air, Norwegian Air Shuttle and Vueling.

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