



» Air Freight and Airport Regions

short version



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*The complete report is available on the ARC website
www.airportregions.org.



The main objective of this report is to provide ARC member regions with information, and the best practice for promoting economic growth related to air cargo and logistics. Strategies, activities and cooperation between different stakeholders in airport regions to enhance a sustainable growth of the sector are important ingredients. Focus is primarily on air freight and related matters.





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Presentation

The Airport Regions Conference (ARC) is an association of regional and local authorities across Europe which have an international airport located within or near its territory, and is the only body of its kind.

The ARC brings together a wide range of expertise at the interface of air transport and local and regional policies. A common concern is to balance economic benefits generated by the airports with their environmental impact, notably the effect on quality of life for local residents.

The ARC was set up in 1994. There are currently more than two dozens of member regions, representing a population of over 75 million people. More than 30 major international airports in Europe are located in ARC regions, handling over 420 million passengers per year.

The main objective of this research is to provide member regions with a wider understanding of the air freight business future development. Different business models and approaches from airports and airlines are studied as well as its implication on regional development.

Air freight is a rapidly growing industry and is foreseen to continue to grow during the next ten years. Since air freight is a growing business and has an implication on regional economic development and planning, ARC Business and Employment Interest group agreed in the year 2000 to address this issue in a study. The interest group recognised the growing importance to enhance the common knowledge and awareness of the business in itself and its implications in economic terms as well as its impact on the environmental and infrastructural assessments. The study contains a European trend analysis

together with a benchmarking study of different kind of strategies and cooperation between stakeholders within each region, depending on type of airport, business models and market potential.

This short version focuses on the European trends. It only highlights differences in strategies around Europe.

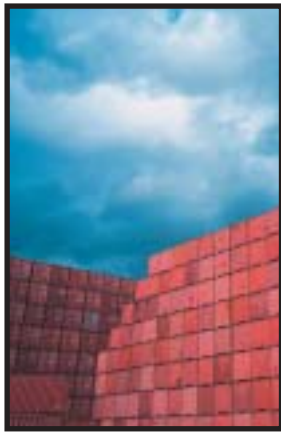
The complete report is available on the ARC website, www.airportregions.org.

This study has been carried out by the Advanced Logistic Group, ALG, in Barcelona under the direction of Mr Ramon Tarrech and Mr Gabriel Rabassa. It is based on their previous experience in air freight logistics and airport development. Advanced Logistic Group has also performed more than 20 in depth interviews with stakeholders all over Europe, in public authorities and the industry itself.

The ARC Business and Employment Interest Group commissioned and supervised the study.

This study and its benchmarking examples will hopefully contribute to a better understanding of the air freight industry and strengthen the dialogue between regional and local stakeholders as well as the aviation industry.

Summary



Four airports alone; Frankfurt, London Heathrow, Amsterdam and Paris CDG concentrate nearly 50 % of the air cargo traffic and 42 % of the long-haul frequencies.

The main objective of this report is to provide ARC member regions with information and the best practice for promoting economic growth related to air cargo and logistics. Strategies, activities and cooperation between different stakeholders in airport regions to enhance a sustainable growth of the sector are important ingredients. Focus is primarily on air freight and related matters.

The study provides an overview on the different ways regions and the industry deal with relevant aspects of the conditions for the industry to develop, and to deal with constraints for growth such as infrastructure, environment, skill training programmes, R&D etc. The study should mention the best practice found in different fields of interest. The study should also reveal key factors for the future growth of the industry.

Examples from the benchmarking study are only highlighted in this short version.

Introduction

Europe moves over 30 thousand air freight tons per day. 21 %, or more than 6 thousand freight tons per day, are moved within Europe. The remaining 79 %, or nearly 24 thousand freight tons per day, are intercontinentally based.

These figures contrast with those from Asia or North America. Asia moves more than 60 % within its borders while North America processes nearly 65 %.

These statistics are explained by two factors:

- Surface transportation is a viable alternative to air mode in Europe. Truck mode has access to major European consumption and manufacturing centers in 1-2 days. Trucks also provide door to door services at a competitive cost.
- Up to 9.7 % of the whole intra-European frequencies are made via regional and single aisle

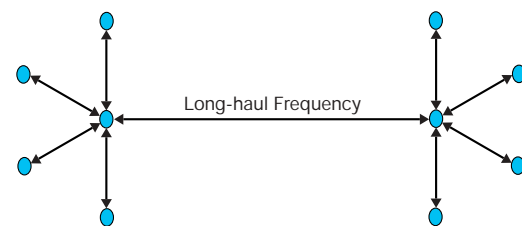
aircrafts which do not permit processing palletizable freight.

Therefore, European air freight business is long-haul based.

Air freight business depend on long-haul passenger frequencies since 55 % of the global air freight traffic is belly based. This permits the airlines to make their passenger network more profitable, and also causes high concentration within the European airport industry. On the other hand, airlines complement their belly based capacity on high density routes by means of dedicated freighters.

The need for concentration in long-haul frequencies makes it necessary to feed world-wide airports from other European airports.

Feeder and Hub Airports in a Long-haul Network



A hub business model permits the airlines to keep lower investment requirements as well as increase load factors and the gross margin per flight.

This phenomenon explains the high concentration ratio in the European airport industry. Four airports alone: Frankfurt, London Heathrow, Amsterdam and Paris CDG, concentrate nearly 50 % of the air cargo traffic and 42 % of long-haul frequencies.

However; competition, deregulation and industry growth are favoring the appearance of point-to-point frequencies. In the increasingly

competitive airline industry, new point-to-point frequencies increase airline value proposal. This trend will permit regional airports to capture market shares from the major European hubs.

In addition, other trends permit regional airports to increase their relevance within the European airport industry.

- The expected increase in dedicated freighters
- Increasing congestion and environmental problems in major European airports

Airbus and Boeing expect the world dedicated freighter fleet to double during the next 15 to 20 years due to a higher freight traffic growth rate than the passenger traffic growth rate.

Since world-wide airports experience congestion problems and environmental effects are becoming more important in major European hubs, the expected increase in dedicated freighter traffic will be diverted to regional airports.

Indeed, congestion and environmental problems are nowadays causing changes within the European airport industry. In this sense, air freight operators are moving away from the usual gateways and use regional and specialized airports

Increasing point-to-point frequencies, congestion and environmental problems and the expected increase in dedicated freighters will make regional airports increase their market share in the near future.

Traditionally, the airport has been positioned as a service provider for both passenger and freight traffic. However, airports are increasingly widening their business scope, changing from traditional traffic service providers to higher value added airports.

In this sense, there are some airports such as

Barcelona airport that have a transportation center business model, permitting the by-road freight services easy access to the airport and the possibility to feed aircraft in a more efficient way.

Other airports such as Brussels or Lyon airport benefit from the consolidation processes of a transport center integrating operations via air mode with by-road destinations. This business model permits the airport to change to a logistics center business model.

Other airports focus on value added services including industrial parks near the airport. Industrial park land availability is an enabler for air freight business.

But there are also other enablers such as the availability of airport access infrastructures and wide infrastructure network operation issues such as 24 H opening, customs, special warehouses, lower pricing strategies, cargo infrastructures that smoothens cargo operations and others.

Those enablers would permit regional airports to offer a better value proposal which may permit capturing a higher market share from the major European hubs.

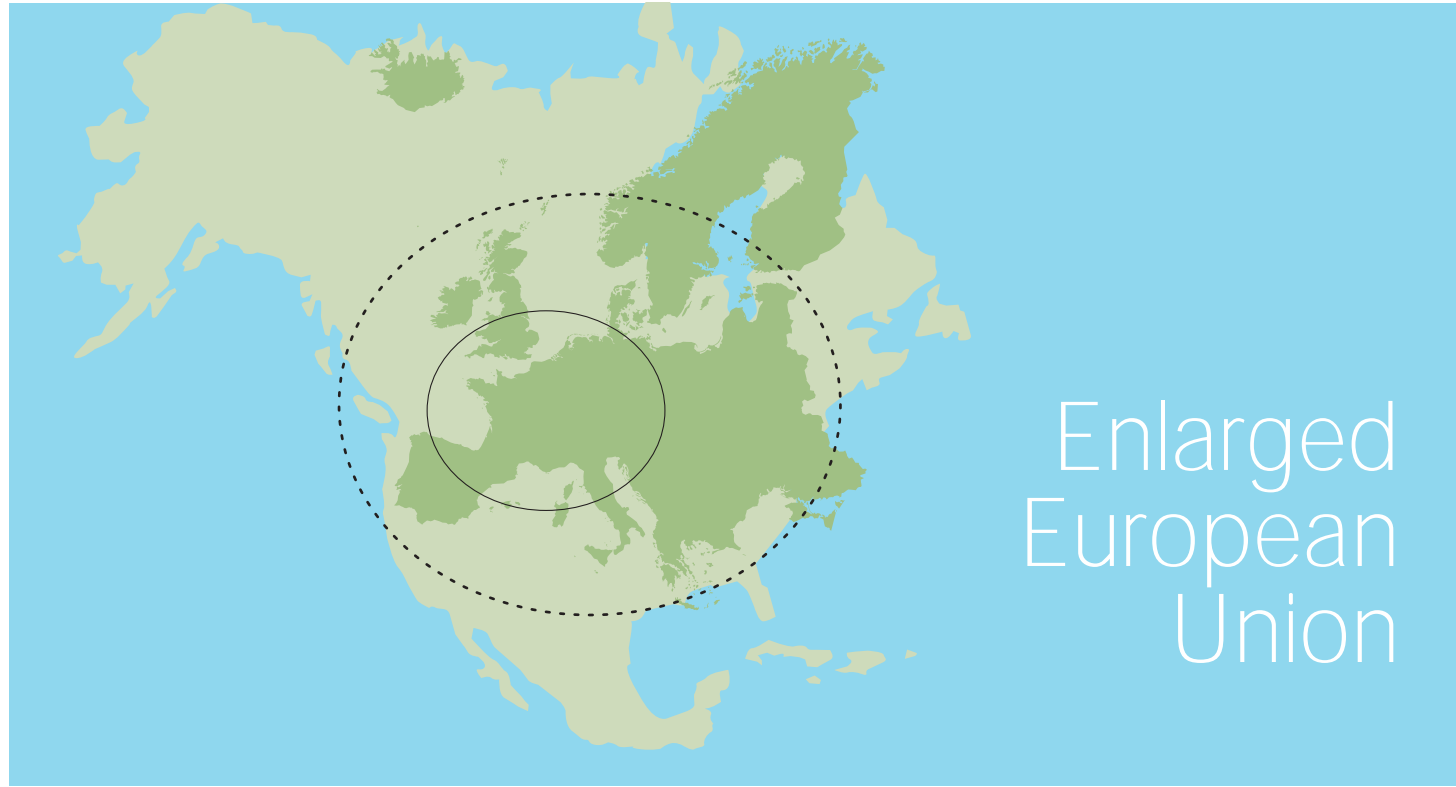
Both demand and supply factors on the air freight business will make the European airport industry change in the near future in favor of both major European hubs and regional airports.

Major European airports will benefit from better environmental and congestion factors due to air freight traffic being diverted from them to regional airports.

Regional airports may benefit from this diversion due to their interest in the economic consequences of gaining air freight traffic.

Therefore, both major European hubs and regional airports will gain in the near future due to their priorities.

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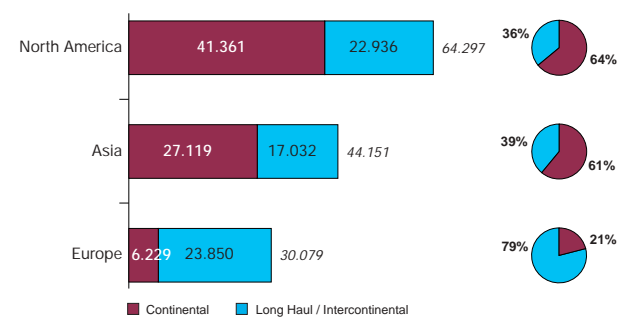


Expected Growth in Market and Industry

European Air Freight Market

Europe processes a total amount of 30,079 freight tons per day, of which 23,850 freight tons come from intercontinental operations. This figure indicates that the air freight business in Europe is a long-haul based business.

Breakdown of Freight Tons per Region



Source: MergeGlobal and ALG's processing

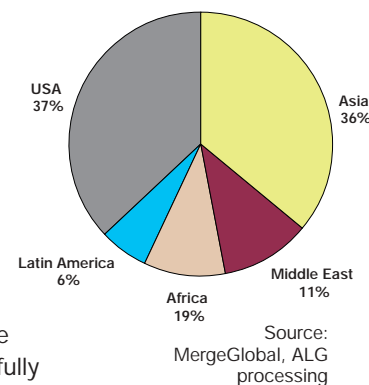
The fact that air freight demand within Europe is just 21 % of the overall European air freight demand is sensitive, while this figure exceeds 60 % in regions such as Asia and North America. The reason for this difference is that Intra-Europe air freight mode has viable substitutes in surface transport both in time-definite trucking and train, while North America and Asia are vast enough regions to ease air freight demand over other alternatives.

However, this situation may vary with the enlargement of the European Union. As is shown in the figure on the next page, the enlarged European Union would provide a larger trade area, favoring trade volumes that are high enough to make the air freight mode a viable alternative to surface transport.

The main areas trading with Europe are USA and Asia, amounting to 73 % of European intercontinental flow.

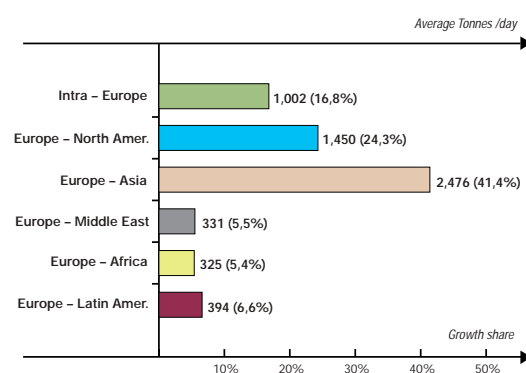
The largest and fastest growing air freight markets are, and will remain, those linking Europe with North America and the Asia-Pacific region. This growth can largely be attributed to Asia's export drive as it has successfully transformed itself into the world's manufacturing center.

Intercontinental Flow in Europe



Source: MergeGlobal, ALG processing

Growth Forecast for Market



Source: Merge Global, Air Cargo World

Expected Growth in Air Freight Industry

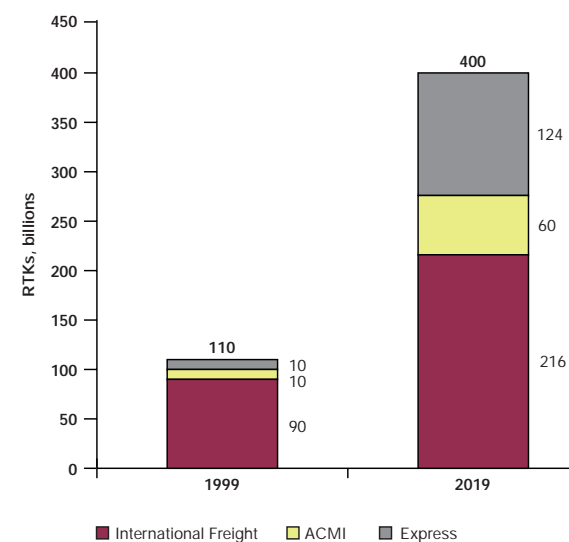
Air freight industry has grown at an average rate of 7.6 % during the last 20 years and is expected to maintain this trend. However, expectations vary from one to another.

Overall, Airbus predicts that air freight will triple over the next twenty years, growing at an average rate of 5.7 %. However, Boeing predicts an average growth rate of 6.4 % for cargo traffic.

Merge Global expects that air freight will grow at an average rate of 3.7 % over the next 15 years.

When considering growth by factors, the Boeing's average growth rate of 6 % for the next 20 years, is basically explained by the explosion of express services.

Evolution of World RTKs by Freighter Service



Source: Boeing and ALG processing

The international express industry is expected to grow at an average annual rate of 13 % until 2019, with the overall share of international traffic expanding from 9.2 % in 1999 to 31 % in 2019.

The traffic carried by ACMI wide-body freighter services has grown 21 % per year since 1990. In 1999, these carriers transported approximately 9 % of the world air cargo traffic. As air cargo traffic growth continues to outpace capacity in many markets, ACMI carriers will continue to assist traditional carriers in meeting overall air cargo demand.

Dedicated freighters provide 15-20 % of European cargo capacity. However this mix will vary in the next 20 years since freighter traffic will grow at an average annual rate of 5.7 %, compared to 4.9 % for passenger traffic.

The difference between the two growth rates has to be assumed to be due to an increase in capacity from dedicated freighters. The world freighter fleet is expected to double during the following 20 years.

European airfreight has viable substitutes while North America is vast enough to ease freight over other alternatives.



» Trends in the European Airport Industry

Airport Positioning

Airport positioning varies from one airport to another, depending on the importance of the air freight business.

Airport positioning may depend on two different variables:

- Scope of the airport, differentiating between world-wide, continental, international, regional and local airports.
- Airport's activity focus differentiating between mixed airports, freighter airports, courier airports and industrial airports.

Sample of Airport Segmentation

Freight to UTA ratio	Passenger < 10 %	Mixed 10 – 50 %	Freight > 50 %	Courier	Industrial
Worldwide Airports > 40000 T		Frankfurt Heathrow Paris CDG Amsterdam		Paris CDG	
Continental Airports < 40000 T > 25000 T	Rome FCO	Madrid London Gatwick			
International Airports < 25000 T > 4000 T	Hamburg Marseille Düsseldorf Barcelona Lyon	Vienna Manchester Lisbon Oslo Stockholm	Brussels Copenhagen Zürich Gothenburg Toulouse Liverpool Milan MXP	Cologne	Toulouse
Regional Airports < 4000 T > 1000 T	Cardiff Rotterdam Bordeaux	Venice Porto Bilbao	Basel Belfast Prestwick Shannon	Ostende	East Midlands
Local Airport > 1000 T	South Hampton Clermont Brno Valladolid	Lille	Milan BGY Hahn Maastricht	Liege Vitoria	

Scope Based on Pax

Source: Activity Focus

A **worldwide airport** is an airport with a world-wide network for both passenger and freight traffic. This makes it necessary to have a dense network connecting the airport to the rest of Europe.

Major European world-wide airports are Frankfurt, Paris CDG, London Heathrow and Amsterdam Schiphol Airport. These airports hub the operations of airlines such as Lufthansa at Frankfurt, Air France at Paris CDG, British Airways at London Heathrow and KLM Royal Dutch Airlines at Amsterdam Schiphol Airport. The fact that it hubs operations of such important airlines makes the airport keep an important long-haul belly hold capacity, permitting an important development in the air freight business.

An **international airport** is an airport with few long-haul passenger and freight traffic frequencies, without all the continents being connected. On a regional level, these airports just cover parts of Europe. These airports do not necessarily hub airline operations, depending on the importance of the airport on a national level. Examples of international airports are Barcelona, Gothenburg, Lyon, Munich, Vienna and Manchester among others.

Continental airports lie somewhere between world-wide and international airports. Continental airports have a denser long-haul network permitting them to process higher cargo volumes. Examples of continental airports are Madrid, London Gatwick and Rome FCO.

Regional airports have a certain medium-haul network, basically at a European level, and do not have a long-haul passenger network. Examples of regional airports are Cardiff, Rotterdam, Bordeaux, Porto and Bilbao.

Local airports have neither medium-haul nor long-haul networks. Their network is essentially nationally based, feeding regional and international airports. Examples of local airports are Southampton, Brno and Valladolid among others.

Each category may be classified by its activity focus. In this sense, differentiating categories are:

Passenger airports are passenger orientated, with very low freight over UTA ratios. Barcelona performs freight over UTA ratio amounting to 3.8 %, whilst the ratio for Lyon amounts to 6 %. However, their current strategy on developing niche markets such as road feeder services permits the airports to widen their business scope to mixed airports.

Mixed airports are those transporting both passengers and freight. This is the case of world-wide and continental airports.

Freight airports are those basically transporting freight with dedicated freighters. This is the case of airports such as Hahn or Ostende.

Courier airports are those transporting courier freight traffic. The main courier companies at European level are UPS in Cologne, DHL in Brussels, TNT in Liege and FedEx in Paris. These operations are based and hubbed in airports with large enough infrastructures to smooth the implied cargo flows.

Industrial and logistics airports are those whose activity, whether it is passenger traffic or freight traffic, is complemented with industrial activities. Airports such as Vitoria and Zaragoza are working on developing industrial and logistics activities near the airport.

Business Models

Air freight business depends on the availability of both demand and capacity.

Capacity is provided either by bellies of long-haul passenger networks or by dedicated freighter frequencies.

Three business models provide capacity to an airport:

- One based on the intercontinental and long-haul network of continental airports such as Frankfurt, Amsterdam, Paris CDG or London Heathrow.
- A second based on cargo airlines hubbing their operations at the airport. This is the case at airports such as Liege with TNT, Cologne with UPS, Luxemburg with CargoLux or Brussels with DHL.
- A third based on capturing cargo frequencies. This is the case at airports such as Gothenburg, Basel, Glasgow Prestwick, East Midlands or Milan BGY.

Airports with a business model based on hubbing cargo airlines or capturing dedicated freighter frequencies perform higher than the average cargo volumes per frequency.

With a lack of long-haul belly capacity the second and third model have to compete with a different strategy approach. They offer instead a better value proposal with a clear focus on the air freight business:

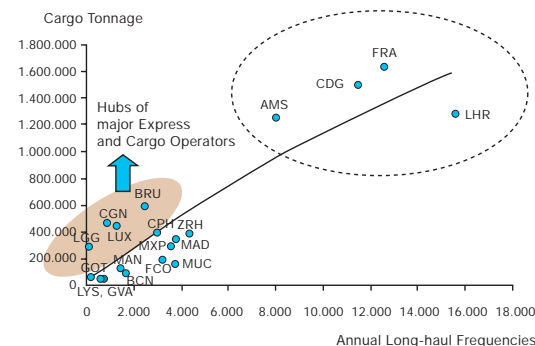
- No slot constraints. Runway capacity at European world-wide airports such as Frankfurt and London Heathrow, is almost fully occupied. However, runway capacity at regional airports is freely available.
- No curfews and opening hours 24 hours per day, 7 days per week.
- Long, wide runways and lower pricing. In such airports, cargo is treated as "the king".

The largest, fastest growing air freight markets are, and will remain, those linking Europe with North America and the Asia-Pacific region.



Airports with a business model based on hubbing cargo airlines or capturing dedicated freighter frequencies perform higher than the average cargo volumes per frequency.

Main Specialized Airports



Source: ACI Traffic Data, OAG July 2002 and ALG processing

When considering the air freight volume and the number of long-haul frequencies at a sample of European airports, it is stated that the total amount of air freight is proportional to the number of long-haul frequencies. The higher the number of long haul frequencies, the larger the air freight business. One of the consequences is the high concentration of the European Air Freight Industry.

The high concentration in the European airport industry is explained by demand and supply factors:

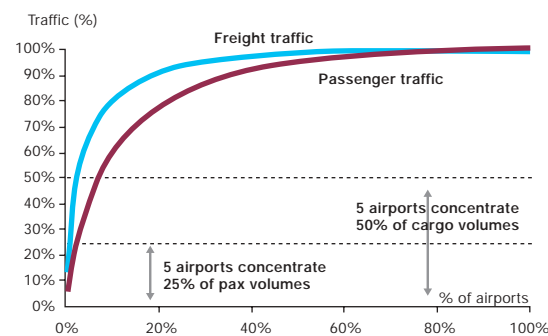
From the viewpoint of demand, there is a high concentration of economic activity in Europe. 75 % of the European economic activity is concentrated between London, Paris, Frankfurt and Amsterdam.

Four airports alone: Frankfurt, London Heathrow, Paris CDG and Amsterdam concentrate almost 50 % of the European air freight industry. However, it is necessary to add 10 more airports to reach 75 % of the overall market. The rest is achieved by adding 155 additional airports.

From the viewpoint of supply, three issues explain the high concentration rate:

- There is a high concentration of long-haul frequencies on very few airports. The long-haul passenger network is established by airlines which benefit from network effects. These benefits come from two sources: an increase in the number of connections due to an additional route and an increase in the load factor due to concentration effects.
- Long-haul belly hold capacity is complemented with dedicated freighters by major airlines in major European airports.
- Major airlines prefer to concentrate cargo operations at few airports in order to get economies of scale and avoiding duplicities in investments.

Concentration in the European Airport Industry



Source: ACI Traffic Data and ALG processing

Very few airports concentrate a very large part of the air freight industry. This concentration benefit airlines and airports due to the above mentioned network effects. While airlines benefit from lower investment needs, increasing load factors and increasing gross margins per flight, they benefit from vaster networks.

However, some trends provide some "light" to second-tier and regional airports.

They are expected an increasing share of the long-haul point-to-point routes.

The continuous deregulating process is favoring the appearance of new operators and therefore an increase in the level of competition within the industry.

In this context, established airlines have chosen to add more frequencies to existing destinations and new nonstop flights to new destinations in order to improve customer service rather than increasing airplane size.

Furthermore, as the market grows, new point-to-point routes will become economically viable.

Over time passenger top routes have been losing market shares due to the progress of new direct point-to-point routes from secondary airports.

The increase of the world-wide freighter fleet will produce a higher number of aircraft movements.

Congestion problems may provoke problems of slot availability at major European airports. Under capacity constraints those airports may facilitate passenger operations over freight operations due to passenger business being much more profitable than freight business. That may deviate dedicated freighter operations to other second-tier and regional airports.

Environmental Restrictions

The environmental lobby is becoming increasingly important in campaigning against airport expansion and in constraining night-time operations.

Runway capacity at Frankfurt, Amsterdam, Paris CDG and London LHR is close to fully utilized. Frankfurt and Amsterdam are planning new runways. However, operation concessions may have to be made to alleviate environmental concerns, and so limiting additional capacity that new runways can deliver.

Therefore, from the viewpoint of regional authorities, concentration effects may have both positive and negative consequences.

The positive consequences come from the economic implications that cargo business has for the region involved. The greater the volume of cargo business, the greater the economic development.

However, there is a level of activity that, when reached, means that marginal increases in cargo business may be undesirable due to their environmental consequences. These are the pervasive consequences of the concentration effects. This is the case at major European airports such as Heathrow, Amsterdam, Brussels, Frankfurt and Charles de Gaulle.

Trading off positive and negative consequences makes airports define their position, resulting in major European airports diverting part of their cargo traffic to regional airports, thus losing market shares in air freight business to regional airports.

The increase of the world-wide freighter fleet will produce a higher number of aircraft movements.

» Air Freight Drivers



Many regional or local airports are trying to position themselves as specialized cargo airports.

Air freight business depends on both demand and supply oriented drivers.

Cargo demand at any airport is driven by its catchment area and the industrial policy employed by public authorities.

The catchment area is the area obtained by using a one day by truck radius from the airport. In this sense, the location plays an important role in air freight demand, as it establishes the industrial activity.

The economic activity within the airports catchment area has a very important impact on the air freight business. The higher the economic activity, the higher the propensity for air freight demand. The type of industry also drives air freight demand.

Since air cargo is at the luxury end of the shipping market, it limits its market target to the high value added industries such as high-tech, biotechnology, capital equipment or intermediate products, and to perishable products such as food products, beverages and tobacco.

Therefore, whether the region is an industrial center or a consumer center for those industries, economic activity may develop air freight demand.

However it is not sufficient to be located in heavy industrial areas, since it depends on other issues such as proximity to major world-wide or continental airports with very competitive by-road services.

Of equal importance is the industrial policy employed by public authorities at a national, regional and local level. The dynamism in developing effective policies for attracting new companies has an important impact on developing the industrial base of the area. A very pro-business policy favors foreign investment in the region resulting in higher levels of eco-

nomical activity. This is the case of most Asian governments.

On the supply side capacity is driven by long-haul passenger frequencies which provide long-haul belly hold capacity and dedicated freighter frequencies.

Apart from these drivers, there are enablers that facilitate the process of capturing new dedicated freighter frequencies.

The main freight infrastructure is the availability of a long runway for dedicated freighters and wide body aircrafts. Apart from the runways, the business model adopted by the airport in the air freight business provides the capacity to smooth cargo flows and permits providing high value added services to logistics and handling operators.

Development Models

The business model adopted by the airport depends on the importance of freight for the airport in the long term. The greater the importance, the greater the airport's business scope is. The possibilities range from a freight terminal to an industrial and logistics park.

The greater the scope of the air freight business in the airport, the greater the infrastructures and the investments required.

On the first level, in a **transportation terminal model**, the infrastructures required are those related to the freight terminal. This is the business model that may arise in local airports due to low levels of air freight demand, but it may also be the positioning for huge airports such as Heathrow which have no interest in logistics activities due to no land availability.

Other airports such as Barcelona have integrated a consolidation operation within the airport, changing it into a **transportation center**; the

second level. This permits the airport to offer logistics and offering operators the possibility to operate in a more efficient way. Operators have warehouses and easy access to them by truck, permitting an efficient consolidation process.

The third level airports benefit from the consolidation operation of a transport center to integrate not only operations with destinations via air mode but also with by-road destinations. This **logistics center** permits achieving an economy of scale when including freight that does not interface with any air mode and profiting from those cargo infrastructures.

The business model permits the airport to convert to a logistics center business model. This is the case at Brussels and Lyon. Furthermore, other indirect activities such as those relating to the truck center i.e parking services for trucks, maintenance center and gas station among others, may be handled. At this level, the business volume permits handling other indirect activities such as ticketing, refrigerators and others. Other non-logistics based activities such as offices, hotels and other general services to employees (banks, restaurants, etc) may be handled.

The fourth level airports are focusing on business models which integrate **industrial and logistics parks** at and near the airport. This is the case at Vitoria, Zaragoza and Amsterdam Schiphol Airport, which are planning to change to this business model.

At this level, manufacturing companies establish distribution platforms within or near the airport freight area due to its ease of access and the availability of logistic infrastructures.

Thus, there are different models which can be pursued by airports depending on their positioning within the freight business. The state, regional or local authorities, depending on the decentralization level, have to consider the role and business opportunities in air freight and necessary conditions to ensure adequate transportation infrastructures by including airport necessities within the whole Urban Plan of the region.

Land availability for industrial location is necessary for major airport expansion. In particular migration to an industrial park requires land to construct logistics and industrial parks.

When considering operations, issues such as opening hours, throughput time, pricing and organization are taken into account. The airport must be able to guarantee adequate security levels, custom services, good throughput times and enough capacity to smooth all cargo operations.

The access infrastructures, intermodal services and intermodal transportation system is a network that interconnects all modes of transportation. Since air freight services provide airport to airport transport solutions, there is a need

to facilitate intermodality between both truck and airplanes. This intermodality makes it necessary to maintain good access infrastructures due to the fact that air freight is a traffic generator of heavy-weight transport vehicles.

When the airport does not transport high volumes of air cargo, more operations are always desired due to its consequences for economic development. However, when higher volumes are reached, marginal increases in air freight operations may be undesirable, as it has a negative effect on the environment.

If that occurs, night-time traffic restrictions may appear thus limiting air freight traffic. Therefore, environmental restrictions drive air freight demand in a negative manner.

Noise restrictions come from two different sides:

- Restrictions in nighttime operations

The nature of the courier and freighter operations and capacity constraints in daytime operation, makes it necessary to operate at night. In this sense nighttime restrictions may cause migration from world-wide and continental airports to smaller airports.

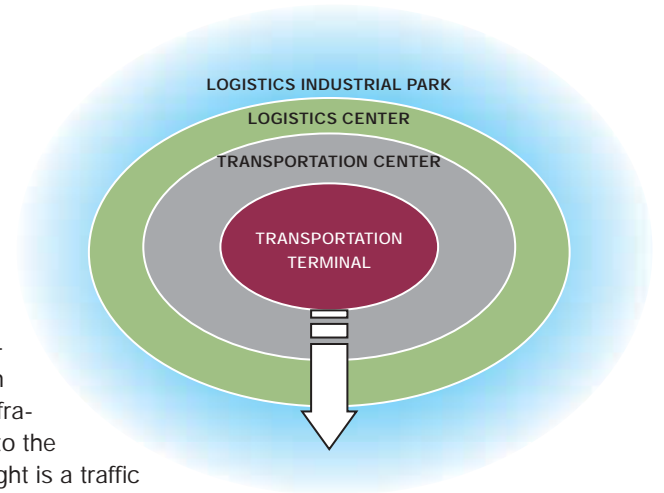
- Restrictions in expanding runway capacity

Expansion capacity is finite at all European airports. Nonetheless, passenger growth should continue by increasing aircraft size, better use of existing runways, and from improved air traffic control.

The tradeoff of expansion for noise reduction appears to be turning into a model for many European airports. In this sense, cargo volume growth at Amsterdam has slowed from double digits to almost zero since the ban was introduced.

In this context, the solution for this problem lies with the carriers:

- Air freight operators may change their aircraft
 - Air freight operators may move away from the usual gateways and use specialized airports, such as Hahn or Liege, that are sprouting up in Europe.
- In this sense, many regional or local airports are trying to position themselves as specialized cargo airports.



Cargo Center Development Models

- Freight Terminal
- General services
 - Freight consolidation
- Truck center
 - Cross docking
 - Warehousing
 - Ticketing
 - Refrigeration
- Industrial Park
 - Trade Port
 - Hotel & offices

Source: ALG

Air Cargo Operations in Europe



Both industrial and logistics initiatives for locating activities at and near the airport contribute to an increase in prosperity.

As already stated air freight business depends on both demand and supply oriented drivers. From the viewpoint of demand, both location and the industrial policy played by public authorities is important.

Location and Catchment Area

Location determines not only the prosperity and the size of the catchment area but also the density of airports within its area of influence.

The greater the prosperity and the size of the catchment area is, the greater the airfreight business.

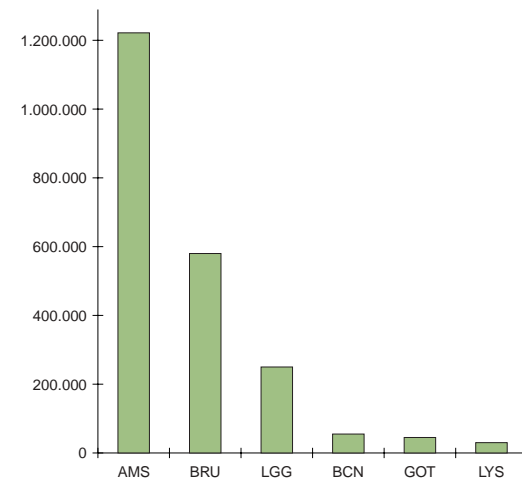
In this sense, the size of the catchment area arises as a key asset for air freight business, due to the fact that air freight demand comes not only from the immediate or local hinterland but also from the macro-region formed by a 500–600 kilometer radius from the airport, the scope covered by a one day by truck.

Airports such as the studied; Amsterdam, Brussels or Liege airports are located within this economically relevant area with a clear impact on their volume of cargo tonnage. Airports such as Barcelona or Lyon are located to the south of this area with less important air freight business. Gothenburg airport, located to the north, also has a less important air freight business.

Other regional airports, based on the availability of intermodal infrastructures, are positioning themselves as a macro-regional hub with a larger scope of influence. This is the case at Barcelona, Lyon or Gothenburg.

While Barcelona and Lyon are positioning themselves as the Euro-Mediterranean hub, Gothenburg is positioning itself as the Scandinavian gateway due to its central location between Stockholm, Copenhagen and Oslo.

Air Cargo Tonnage per Airport



Source: ACI Traffic Data

Competition

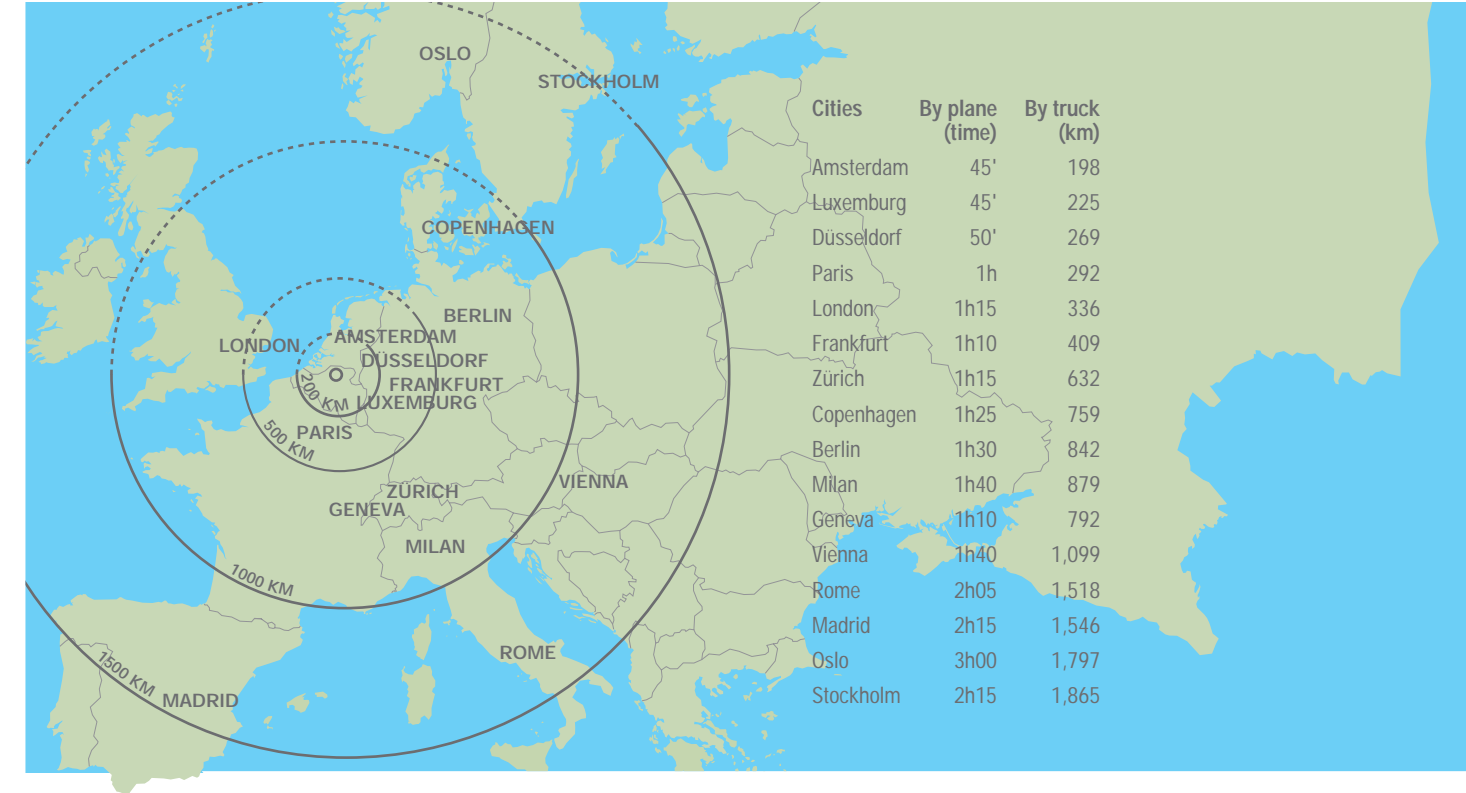
On the other hand, location determines the distance to other European airports. The greater the density of airports within a certain area, the greater the competition among the airports involved, and therefore the greater the difficulty in attracting dedicated freighter operations.

The area covered between Amsterdam, Frankfurt, Paris CDG and London LHR concentrate not only a high density of cargo operations but also a high density of airports. These airports suffer from high competition from major European hubs, and thus, great difficulty in attracting dedicated freighters.

Thus, location plays a particular role in determining air freight business.

Industrial Policy

The industrial activity located in the airport's area of influence, particularly those industries requiring



air freight capacity for long-haul transportation, definitely contributes to cargo tonnage volumes in the airport.

In this sense, regional promotion for industry investment, whether it is foreign or locally based, is particularly important since it contributes to increasing local and regional industry and therefore increasing the prosperity of the catchment area.

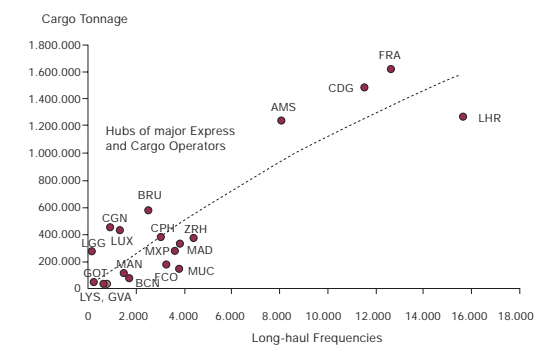
An airport is always an asset for industry location or distribution center location, and of particular interest for those industries or logistics centers requiring air freight services.

An airport may play a particular role in location related decisions as it may contribute to locate logistics companies, industrial activities and distribution centers at and near the airport. Furthermore, as is the case at Amsterdam Schiphol Airport, the airport itself may play a particular role in the process of attracting and locating new companies by becoming a land developer for business and logistics park development. However, this is a role usually played by municipal authorities.

Amsterdam handles higher cargo volumes than the European average when taking into consideration long-haul frequencies. Amsterdam processes more than 1.2 million cargo tons when it should be nearly 1.0 for its long-haul capacity. This may be explained by its policy of attracting logistics operators to logistics parks at and nearby the airport.

On the other hand, London LHR handles the same volume of cargo tons, but with double the Amsterdam's long-haul network. This is explained by congestion problems around London which benefit other airports surrounding London.

Correlation Long-haul Frequencies vs Cargo Tonnage



Source: ACI Traffic Data, OAG and ALG processing

Location is a key asset for airfreight business

Other airports such as Brussels or Lyon develop cargo ports for locating logistics activities at and near the airport. These cargo ports permit locating distribution centers for both logistics operators and industrial companies at or near the airport, thus reducing time-to-market processes and contributing to an increase in airport cargo tonnage.

Both industrial and logistics initiatives for locating activities at and near the airport contribute to an increase in the prosperity of the airport's catchment area, and in this process public authorities, whether they are regional or municipal, usually play a particular role by being land developers.

Therefore, the location of the airport arises as a key factor in determining air freight demand, but also the initiatives played by public authorities in attracting new companies and investments play an important role in invigorating both industrial and logistics activities.





Good interconnectivity among the different transportation modes permits improved allocation of cargo flows, higher efficiency and lower time-to market processes.

Supply Oriented Drivers

Other factors contribute to air freight development. Basically those factors come from the supply side: availability of long-haul frequencies and availability of dedicated freighters.

The availability of capacity to long-haul destinations comes with two factors:

- Long-haul frequencies via belly based aircraft
- Dedicated freighter frequencies

In Europe 79 %, or nearly 24 thousand freight tons per day, are intercontinentally based and the remaining 21 %, or 6 thousand freight tons per day, are intra-European based. Therefore, air freight business is long-haul based in Europe.

This phenomenon explains the high concentration rate in the European air freight market. Only four airports: Frankfurt, London Heathrow, Paris CDG and Amsterdam Airport Schiphol concentrate nearly 50 % of the European cargo tonnage.

However, lower yields and higher competition has caused the appearance of new point-to-point frequencies offered by new airlines. This strategy would permit secondary airports to capture market shares from the main European hubs.

Since major European hubs have congestion problems and environmental effects are becoming more important, the expected increase in dedicated freighter traffic may be diverted to regional airports.

That trend is possibly due to the fact that while belly-based capacity is limited to those European airports with long-haul destinations, dedicated freighter frequencies may be established at any airport.

Enablers

In addition to demand and supply oriented drivers, the existence of enablers may permit smoothing cargo flows and thus reducing time-to-market processes.

The availability of intermodal infrastructures and a high interconnectivity among the different transportation modes permit improved allocation of cargo flows between the different modes: air, road, rail and sea.

This will increase the value-proposal of the region in terms of competitiveness against other regions. In this sense, cities such as Amsterdam, Gothenburg or Barcelona for example, have a road and rail network, a seaport and an airport within a short radius.

Good interconnectivity among the different transportation modes permits improved allocation of cargo flows, higher efficiency and lower time-to market processes.

The level of freight infrastructures depends on the airport's business model. While Amsterdam Schiphol Airport is an industrial and logistics center, Gothenburg airport is a freight terminal.

The airport's business model may vary from an air freight terminal to an industrial and logistics center, depending on the level of added value services such as truck center, cross-docking services, warehouses, logistics and industrial parks at and near the airport.

These freight infrastructures permit logistics operators, handling companies and airlines to gain access to higher added value services such as dedicated perishable and high-tech centers, in addition to achieving greater efficiency and quicker time-to-market processes.

Operations are also an enabler for dedicated freighters. All operations should be focused on

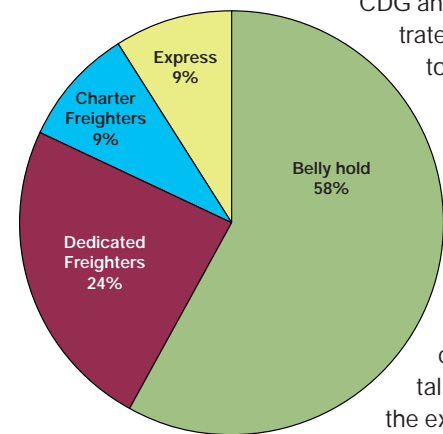
achieving high efficiency ratios and quick time-to-market processes. In this sense, the airport's positioning may vary from one airport to another. Gothenburg airport does not offer the last generation information systems for delivering airfreight services but however, it is performing quick time-to-market processes which has permitted it to attract nine weekly departures to long-haul destinations.

In this sense, a very important variable when considering operations are congestion levels in airports. Gothenburg is completely free from congestion, while other airports such as Amsterdam, Brussels and other European hubs may have major congestion problems.

Environmental restrictions are a limitation. Night bans limit the capacity of an airport to daytime operations and restrict airline flexibility. All of these issues are enablers which may attract operations, whether all or part of them, to the airport.

A high interconnectivity among the different transportation modes permit improved allocation of cargo flows between the different modes: air, road, rail and sea.

Breakdown of Cargo Tonnage by type of Operation



Source: Boeing, GMC Airbus and ALG processing

» Conclusions



This study of Air freight and Airport Regions, shows clearly that the development of air freight is of great importance all over Europe.

It is also of high importance for the European competitiveness in international affairs. It might even be an important tool for the development of the intra European market in a new enlarged EU.

At the same time this study shows us the complexity of the Air freight Industry and the grand implications on both local, regional and national levels. Not only in terms of economic development but also for long term investments in infrastructure and environmental side effects for residents in airport regions.

The study also gives us an insight into an industry in rapid growth and structural changes. In times of change the need for a dialogue between all stakeholders within the aviation industry and public authorities are of vital importance. Long term policymaking and planning strategies are needed to ensure the right requirements for this important industry and to set the right conditions for economic activities and investments as well as environmental concern.

The ARC Business and Employment Interest Group hope this study will contribute to a better understanding of the air freight industry, business strategies applied by airline companies and airports, as well as local and regional policies in Europe.

We also hope the best practise examples from Airport regions will inspire local and regional authorities to consider air freight as an important part of their economic development initiatives, to enhance prosperity both for the region as well for Europe.

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The Airport Regions Conference (ARC) is an association for regional and local authorities across Europe which have an international airport located within or near their territory, and it is currently the only body of its kind.

The ARC brings together a wide range of expertise at the interface of air transport and local and regional policies. A common concern is to balance the economic benefits generated by the airports with their environmental impact, notably the effect on the quality of life for local residents. ARC works with the European Commissioner for Transport and her Cabinet and the EC Directorates General for Transport, for the Environment, and for the Regions.

The ARC was set up in 1994. It currently has more than two dozen member regions, representing a population of over 75 million people. More than 30 major international airports in Europe are located in ARC regions, handling more than 420 million passengers.



The complete report is available on the ARC website www.airportregions.org.