

AIR CARGO IN AIRPORT REGIONS

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CONTENTS

WHAT IS AIR CARGO?

1. A definition of air cargo
2. The importance of air cargo in the world economy
3. The value chain of air cargo
4. Different models of air cargo operations
5. Different kinds of cargo airports

HOW IS AIR CARGO EVOLVING?

1. Our approach
2. A globalisation of trade which generate a growth of air cargo industry
3. A new geography of trade which implies a new hierarchy of actors
4. The dualisation of markets implies new kinds of services and organisation

TO HOW IS AIR CARGO IMPACTING LOCAL COMMUNITIES?

1. Air cargo, jobs and connectivity
2. Air cargo and the environment

WHAT CAN LOCAL COMMUNITIES DO TO SUPPORT AIR CARGO?

1. Location criteria for the air cargo industry
2. Some examples of new trends around airports and what can be done

ANNEXES



FROM THE PRESIDENT

ABOUT ARC

The Airport Regions Conference (ARC) is an association of regional and local authorities across Europe with an international airport situated within or near its territory. 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 against their environmental impact, notably the effect on the quality of life of local residents. The ARC serves as a network to exchange and gather expertise amongst the members and as a Voice of European Airport Regions to the European Institutions.

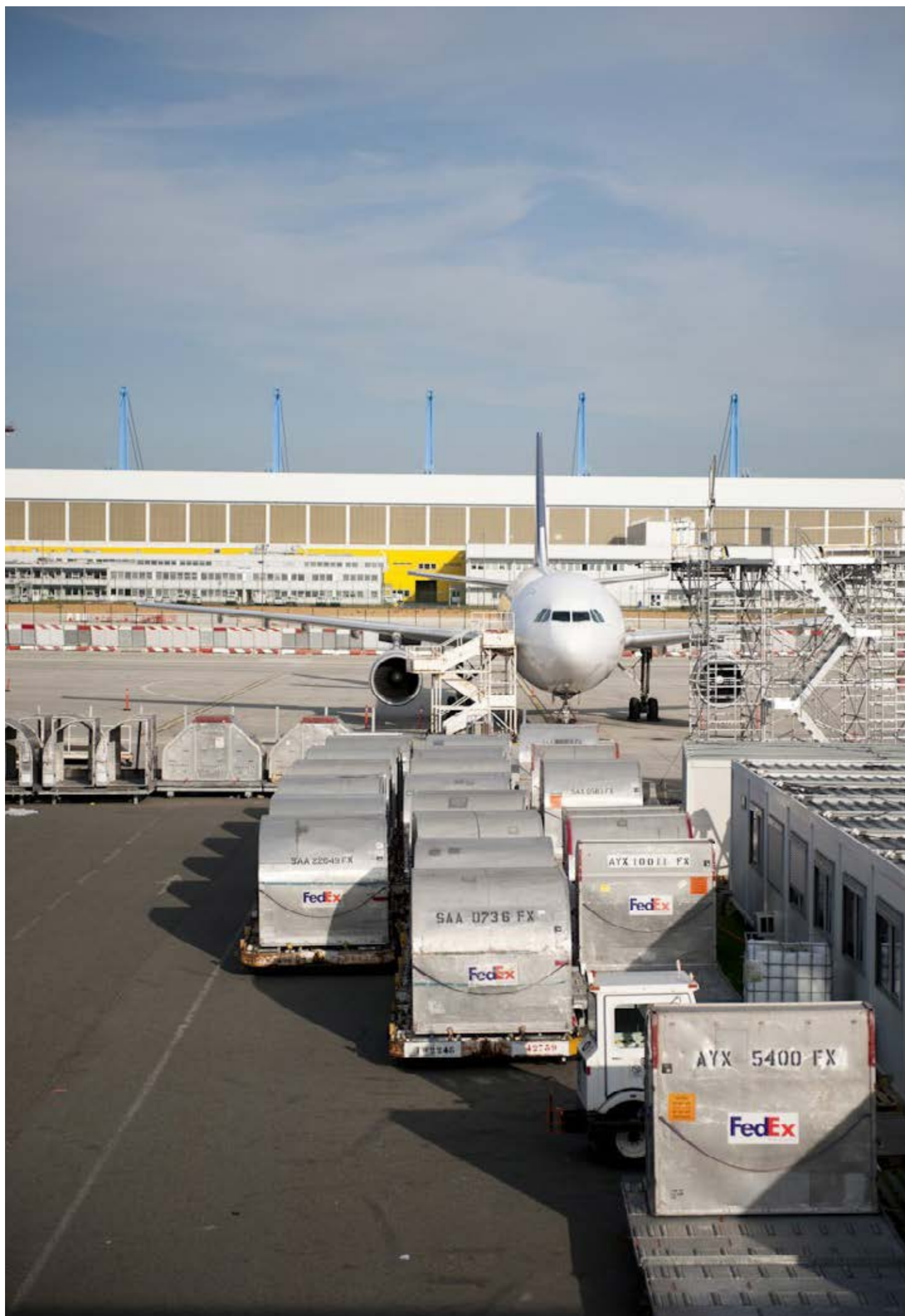
Many European airport regions have a cargo capacity or are willing to explore the potential for develop that capacity. By commissioning this study, ARC wants to be up to date on the evolution of the cargo industry and in Europe and in the world. They want to be informed in order to be pro-active in the management of this capacity, in order to anticipate the future needs of the economic sector, they want to identify the development possibilities and in order to remain attentive to the needs of the residents when it comes to employment and preservation of the environment.

We will note a few points of importance out of that study: firstly, the territorial impact of the cargo industry is not a concern to the cargo stakeholders. This was preeminently visible in the elaboration of the study itself. Nonetheless, and that would be a second lesson taken from the study, the geographical impact is extremely perceptible at European and local levels. We are seeing the emergence of "European clusters", entire areas that are sometimes transnational areas that do have a major airport cargo focus. Another element of importance to the ARC members is that the cargo industry is evolving faster than anyone imagined: it is less and less an industry of its own, and it evolves more and more in barrel with the passengers industry.

We hope you will find this study as valuable as we did and we wish you an excellent reading.

Sergi Alegre

FEBRUARY 2016



FOREWORD

Air cargo services have a special place in modern supply chains, carrying the most valuable, most perishable, and most urgent shipments across the world. From necessities such as pharmaceuticals to luxuries such as exotic flowers or diamonds, air cargo services shrink time and space to link customers to distant sources quickly.

At the local scale air cargo operations can be key to the economic development of local communities and an important part of airport activities. In recent years, air cargo faced new challenges and developed new activities. In that perspective the ARC (Airport Regions Conference), representing local authorities, wished to deepen their understanding of the cargo industry in order to clarify:

- How it works, who are the main players;
- The main issues and trends it has to face;
- The way it impacts territories and local communities.



WHAT IS AIR CARGO?

OVERVIEW AND KEY FIGURES



1. A definition of air cargo

Definitions of air cargo vary according to sources and actors: mail (postal services, operated by postal operators, as regulated by the Universal Postal Union) can be considered as a part of air cargo or not.

The rationale for this debate is related to liability rules and security procedures. According to Universal Postal Union, mail operators are not responsible for the content of mail. But when it comes to transport security standards, mail must follow the same requirements as other goods shipped by air.

As a consequence, the various statistics published about cargo do not systematically cover mail. In this report we will clarify when mail is included or not.

For example:

- ICAO's¹ definition of cargo excludes mail;

1 International Civil Aviation Organisation

- IATA² and the FAA³ consider all goods as part of cargo (including mail).

In this report we consider cargo as: any property carried or to be carried on an aircraft, other than accompanied or mishandled baggage, air carrier materials, in-flight supplies, for which an airwaybill, bill of lading or other receipt is issued by the carrier.

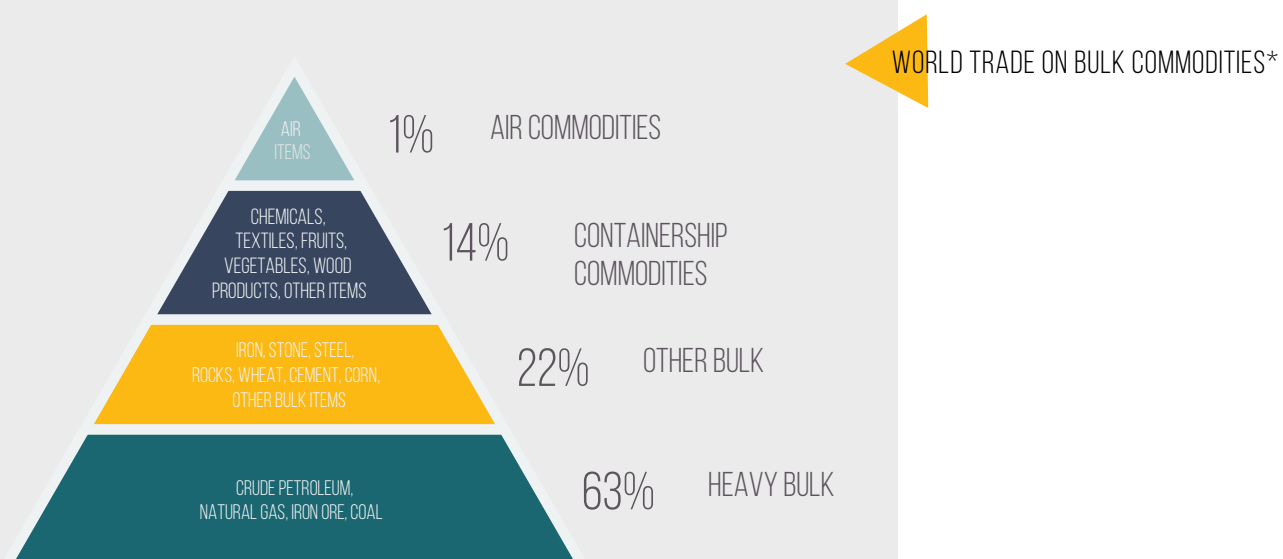
2. The importance of air cargo in the world economy

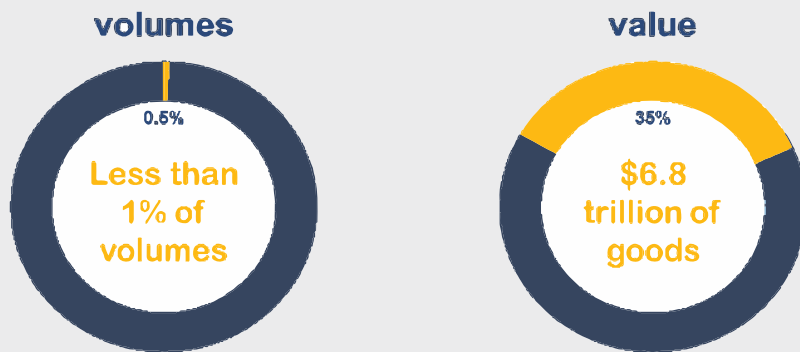
Today over 80% of world trade is in raw materials and other bulk items, such as oil, metal ores, and grains (as shown in the graph below). Most of these commodities are low value and are not time sensitive, hence are shipped mainly by sea in specialised tankers or bulk carriers.

2 International Air Transport Association

3 Federal Aviation Administration

* Boeing, World Air Cargo Forecast, 2014-2015





VOLUMES AND VALUE OF WORLD AIR CARGO*

Air cargo is used for the most valuable and time-sensitive goods:

- 30% of shipped goods are perishables (by nature: food or flowers, or by destination: press);
- The 70 other % are manufactured goods (spare parts, chemicals, pharmacy, etc.)

Air cargo represents about 1% of world trade exchanged in volume of good shipped (but 35% of world trade in value).

3. The value chain of air cargo

OVERVIEW OF THE DIFFERENT STEPS OF THE AIR CARGO PROCESS

The following graph shows the different steps of the air cargo process, from the shipper (the client) to the consignee (the one who will receive the good).

Note that this process is different between “express cargo” and “general cargo”. In case of express cargo/integrators, the express company provides a “door-to-door” service whereas a general cargo airline only transports the good between its different premises (airports).

a. The shipper / seller / consignor / exporter / trader / sender

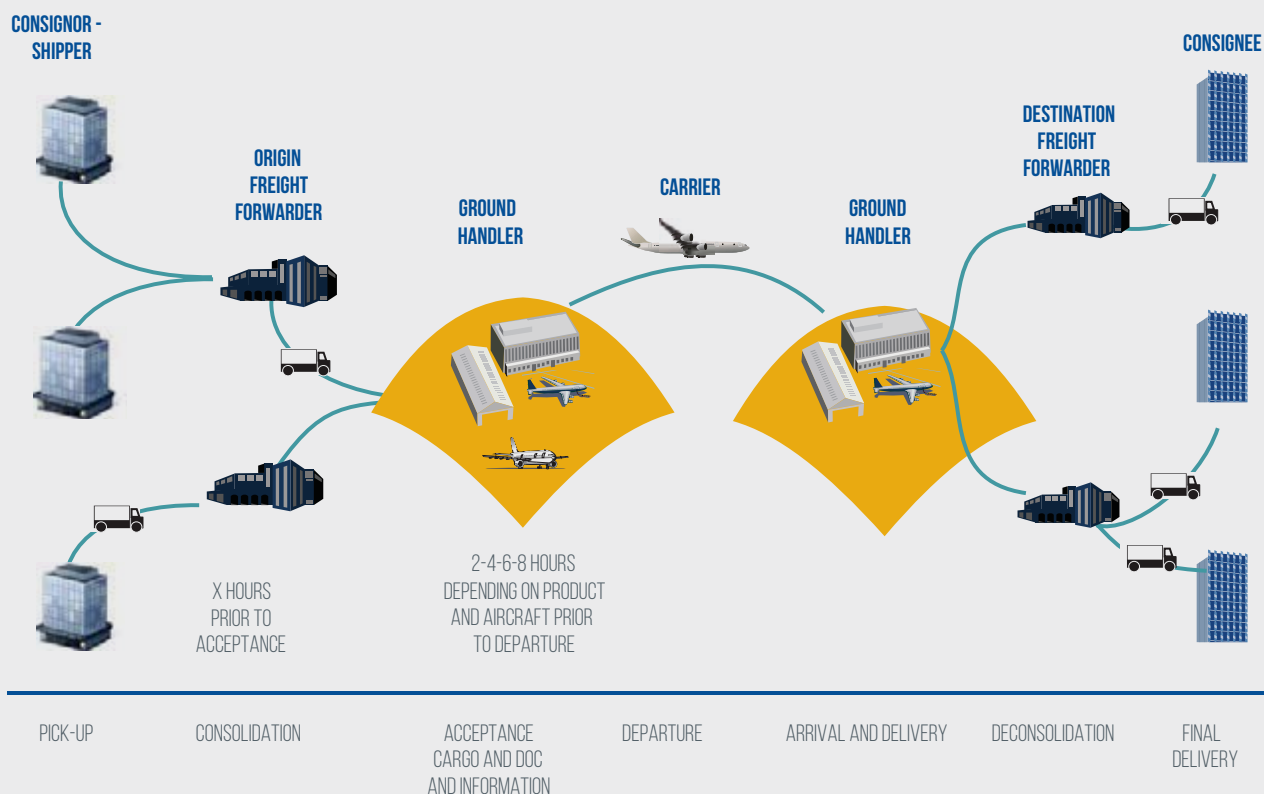
- The shipper is the entity responsible for manufacturing and/or selling goods. It may manufacture the goods or simply buy them for resale.
- In a commercial sense it deals at the other end of the supply chain with the buyer.
- The shipper will often engage the services of a broker or agent to manage the movement of the goods, including meeting the requirements of regulatory border agencies (e.g. Customs).

b. The broker / Agent / Freight Forwarder

- The broker is mandated by the shipper to manage the movement

* IATA, Cargo strategy, 08/2012

** ICAO/WCO, Moving Air Cargo Globally, First edition



AIR CARGO OVERVIEW**

GLOSSARY: WHO'S WHO?

Air cargo has its own jargon. In order to enlighten the way it works, and especially who are the different actors, we propose in the following a glossary.

Note that:

- Many of the following terms are used interchangeably in common usage. For example the term “consignor” is commonly used to describe the “shipper”;
- Some of these players can play various roles. In that perspective, the limits between the functions could be blurred (an airlines could also act as a handler for example);
- An extended glossary of the different of air cargo stakeholders is attached in annex.

of the goods, including meeting the requirements of regulatory border agencies (e.g. Customs).

- Negotiates large-volume transport rates with carriers and resells this capacity to shippers.
- In general, the broker will assume the legal liabilities of acting as a carrier.

c. The ground handler

- Receives goods and documents (air waybill).
- Arranges for air shipment to be managed in such a way that they are ready for transport by aircraft operators

- Inspects freight and verifies that it is ready for carriage
- Loads containers and builds pallets (consolidation)
- Can also provide other shipping services: packaging and temporary freight storage.

d. The aircraft operator/carrier

- Transports goods and is responsible for any possible loss of the goods during transport.
- Could transport goods by air or operate road feeder service (RFS) / Trucking.

	Integrators / Express carriers	General cargo	
		Air cargo only carriers	Combination carriers
Business model	Door to door solutions, Day + 1 solution.	Operating dedicated full freighters.	Passenger airlines selling belly capacities (or combi) on passenger aircraft. Can also operate full freighters.
Examples	DHL, TNT, UPS, FedEx, etc	Cargolux, Khalita, Air Cargo Global, etc.	Lufthansa, Air France, KLM, Emirates, etc.
Types of goods shipped	Highly time sensitive goods (the shipment usually lasts less than 24 hours) Examples of goods concerned: Envelopes & small parcels,	Time sensitive goods (the shipment usually lasts a couple of days) Examples of goods concerned: special goods (live animals, cars, etc.) or oversized goods	
	perishables, high tech items, healthcare and pharmaceuticals, etc.		
Nota Bene	Express operators can also act as general cargo operators for some goods and clients	General cargo operators can sell their capacities to express operators. Passenger airlines operate passenger aircrafts (belly cargo) and full freighters but they phase out their freighter fleet.	
Market share of the world air cargo traffic	25 to 30%	10 to 15%	55 to 65 %

e. The consignee

- The party shown on the air waybill to whom the shipment is consigned.
- It is not always the final buyer. In some countries it is the buyer's bank.

4. Different models of air cargo operations

As shown in the overview of the air cargo process, the industry is divided between “express cargo” and “general cargo”:

- Express cargo proposes express (generally door-to-door, day +1) delivery solutions (mainly parcels);
- General cargo handles less time sensitive goods that need tailor-made solutions (related to temperature control, live animals, etc.). Note that those carriers can be “cargo only airlines” (pure players) or “passenger airlines” combining passenger and cargo activities.

This distinction between “express” and “general” air cargo blurs. General cargo

providers are expanding their time-definite offerings, and express carriers, are also proposing “general cargo” services. Ultimately, the air cargo customer benefits from increased service options and lower prices as market pressure brings competing products into the market.

The prior table summarises the main theoretical characteristics of those two models.

5. Different kinds of cargo airports

Three main types of cargo airports can be identified, depending on their business models and the kind of air cargo that they accommodate.⁵

Note that these definitions are theoretical and that the limits between the different models could be blur in some cases.

⁵ Note that these definitions are theoretical and that the limits between the different models could be blur in some cases.

* Arcandia Consulting

	Mainly full cargo hubs	Passenger hub airports	Regional point to point airports
Examples	Liege, Leipzig, Paris-Vatry, St Nazaire, etc.	Frankfurt, Charles de Gaulle, London Heathrow, etc.	East Midlands, Bordeaux, etc.
Business model	Focusing on cargo activities (mainly continental hub for an integrator)	Focusing on PAX activities as a world hub and having a huge cargo activity.	Focusing on PAX activities on point-to-point routes and feeder flights to hubs.
Main types of cargo aircrafts operated	Full freighters.	Passenger aircrafts (belly).	Mainly trucks.
Main added value proposed to the cargo industry	H24 operations, no slots, no congestion, available green-fields. Proximity to a huge catchment area	Ability to connect full cargo flights to belly cargo (PAX) Proximity to a huge catchment area	Proximity to a huge catchment area
Main issues	Ability to preserve H24 operations	Possible conflicts of use between PAX and freight operations Capacity crunch	

TYPOLOGY OF CARGO AIRPORTS*

HOW IS AIR CARGO EVOLVING?

AIR CARGO AND THE EVOLUTION OF THE MARKET

1. Our approach

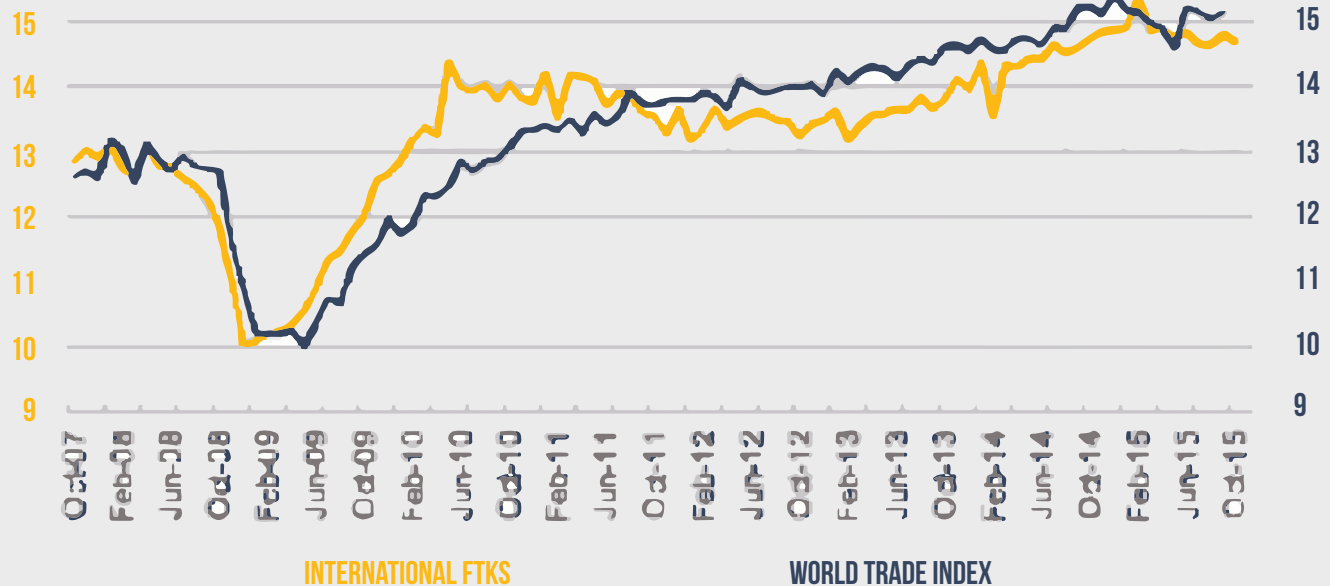
Our analysis of the various trends and issues air cargo industry is facing follows a “**market oriented approach**”, aiming at understanding the main trends of global economy, and the way it impacts air cargo, its strategy and organisation at local level.

The table below summarizes the main identified trends and their consequences for air cargo.



BILLION FTKS
(SEASONALLY ADJUSTED)

INDEX OF WORLD TRADE, 2005=100
(SEASONALLY ADJUSTED)



WORLD TRADE IN GOODS AND AIR FREIGHT/CARGO TONNE KILOMETRES**

2. A globalisation of trade which generate a growth of air cargo industry

Air cargo has always been a good reflector of world trade and follows its trends (As shown in the graph above).

In parallel, new industrial organisational concepts have made air cargo an important asset for world trade, supporting its dynamic:

- Just in time and E commerce
- Reduction of “time to market” (length of time taken in product development process from product idea to the finished product).

- Enlargement of markets (firms serve larger markets from fewer points), ability for SMEs to serve new markets with the reactivity of local firms.

As a consequence, on the long run (since the 2009 crisis) air cargo has been growing.

For the medium run, both the industry and IATA expect solid, but not spectacular, growth in air cargo volumes. IATA foresees an average growth rate of 4.1% per annum over the next five years.⁶

⁶ IATA Press release, Five-year Forecast Shows Improved Outlook for Air Cargo, Oct 2014

* Arcandia Consulting

** Netherlands CPB, IATA



WORLD FREIGHT TONNE KILOMETRES TRILLION*

3. A new geography of trade which implies a new hierarchy of actors

The hierarchy of freight actors reflects the global evolutions in world economy and the changing geography of world trade and of air transport in general.

In this rapidly changing global landscape, Europe and North America no longer dominate the market.

Even today the Asia/Pacific region is the world's largest airfreight market with a 40% share in terms of world FTKs, Europe and North America came in at 22% and 21%, respectively.

* IATA, Cargo Chart Book, Q3 2015

** Based on GEA members' data

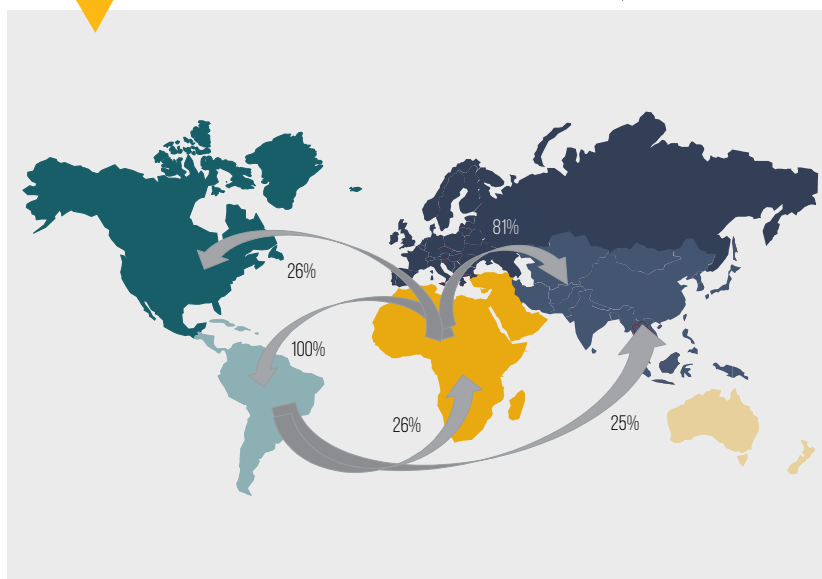
The growing economies of India, China and South America are expected to become the “new drivers of aviation” in the coming decades. Whereas world scheduled freight traffic, measured in freight tonne-kilometres (FTKs), grew strongly by 4.6% in 2014, Middle Eastern airlines recorded the fastest performance in freight traffic with a growth of 11.3%.

Tables in Annex 2 show those results at the airport level.

Long-term forecast tends to show that Asia will continue to lead the industry growth, through a dynamic market and exchanges with other world regions (especially North America).

A focus on express cargo, which remains marginal at world scale, shows that new trends come out. Statistics highlight a high growth of volume between Africa and the rest of the world (4 of the top 5 inter-regional fastest growing flows are linked to Africa and the Middle-East).

THE TOP 5 INTER-REGIONAL FLOWS WITH FASTEST GROWTH, 2011 - 2013**



As a consequence, the hierarchy of air cargo actors is changing, both for airlines and airports. It appears that the new leaders of the industry are now the ones located in the most dynamic regions (Asia) and the ones able to connect those regions to the other ones (like Gulf carriers and airports).

AIRLINES

The largest cargo airlines are still the express cargo ones. But now Asian and Middle-Eastern are among the leading operators. (Details in Annex 2)

AIRPORTS

AT WORLD SCALE

Asian airports are now among the largest, they have strengthened their position between 2004 and 2014 (As shown in the table below)

FOCUS ON EUROPE

At European scale the hierarchy remains stable. Express hub airports are among the largest.

Except for Paris, the largest cargo airports in Europe benefit from a growth in their traffic.

*** ACI World

Airport	Rank 2014	Rank 2004	Var rank	Volume 2014 (t)	Volume 2004 (t)	Var volume (%)
Hong Kong	1	2	1	4,4	3,1	41,9
Memphis	2	1	-1	4,3	3,5	22,9
Shanghai	3	14	11	3,2	1,6	100,0
Seoul	4	5	1	2,6	2,1	23,8
Anchorage	5	4	-1	2,5	2,2	13,6
Dubai	6	18	12	2,4	1,2	100,0
Louisville	7	11	4	2,3	1,7	35,3
Tokyo Narita	8	3	-5	2,1	2,4	-12,5
Frankfurt	9	8	-1	2,1	1,9	10,5
Taiwan	10	13	3	2,0	1,7	17,6
Miami	11	10	-1	2,0	1,8	11,1
Paris CdG	12	7	-5	1,9	1,9	0,0
Singapore	13	9	-4	1,9	1,8	5,6
Beijing	14	28	14	1,8	0,7	157,1
Los Angeles	15	6	-9	1,8	1,9	-5,3
Chicago	16	15	-1	1,6	1,5	6,7
Amsterdam	17	16	-1	1,6	1,5	6,7
London Heathrow	18	17	-1	1,6	1,4	14,3
Guangzhou	19	?	New entr.	1,5	?	?
New York City (JFK)	20	12	-8	1,3	1,7	-23,5

CARGO AIRPORT RANKINGS BETWEEN 2004 AND 2014***

The market is highly polarised: the top five airports handle almost 50% of the European cargo.

Apart from the top largest airports, which are both in the top hierarchy for cargo and passengers, it appears that large cargo airports are usually second category passenger airports (or even with very little passenger traffic like Leipzig, Luxembourg and Liège).

From a geographical point of view, it appears that the largest EU cargo airports are mainly located in the “blue banana”.⁹

Many regions and cities host different cargo airports (even among the top 25), constituting some kind of cargo cluster like around Frankfurt, London, Milan, etc.

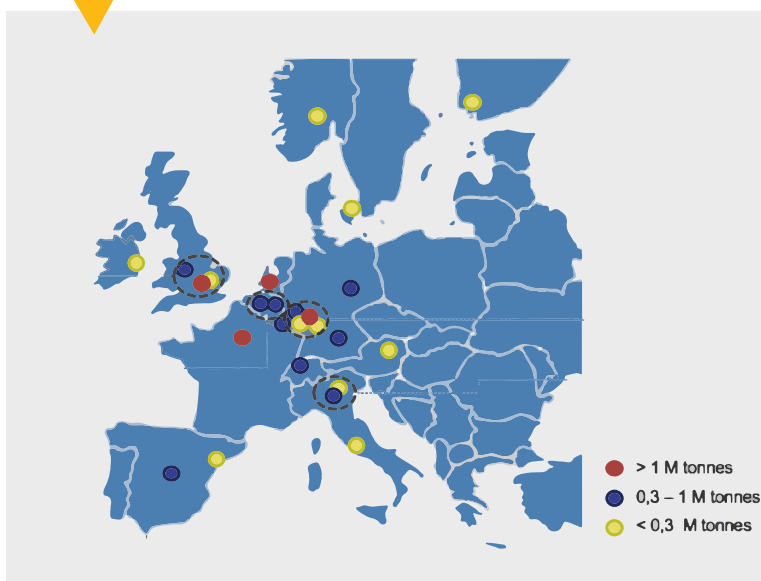
An analysis of the top 25 EU cargo airports shows that four of them have a

⁹ The Blue Banana (also known as the Hot Banana, Bluemerang, European Megalopolis, Manchester–Milan Axis or European Backbone) is a discontinuous corridor of urbanisation in Western Europe. It stretches approximately from North West England in the north to Northern Italy in the south.

* Eurostat

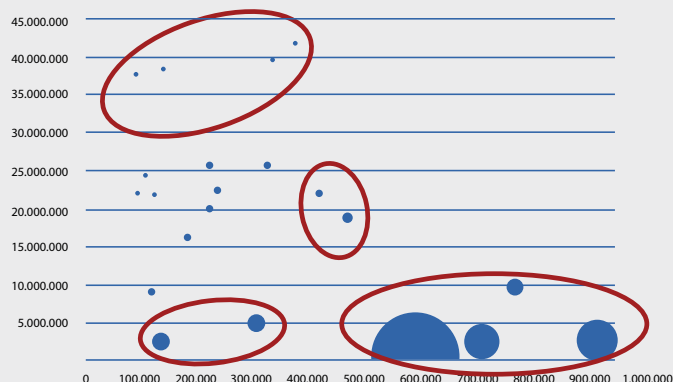
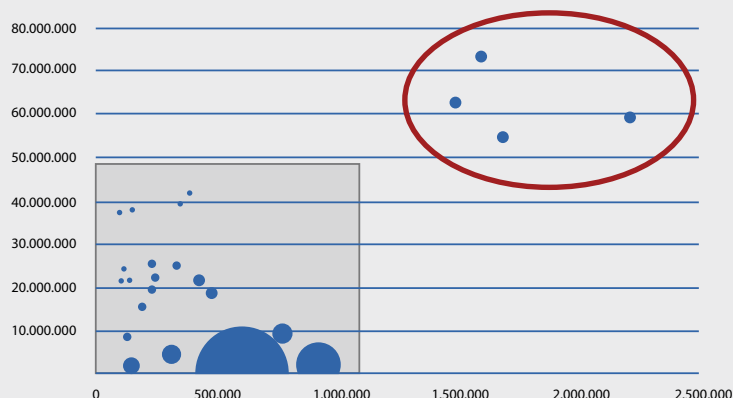
** Eurostat

TOP 25 EUROPEAN CARGO AIRPORTS*



totally different positioning, regarding the volumes of cargo and the number of passengers they handle and the ratio between passengers and cargo¹⁰: Frankfurt, Amsterdam, London Heathrow and Paris CDG are the leading EU hubs for cargo and passengers.

¹⁰ In order to assess the weight of cargo in the activities of airports, we calculated a ratio “number of cargo kgs handled per passenger”.



PASSENGERS/TONNES OF CARGO RATIO; NEW TYPOLOGY OF AIRPORTS**

A focus on the other airports shows different kinds of positioning:

- “Cargo oriented”: Cargo hub airports, mainly express (Leipzig, Cologne, Luxembourg and Liège), which handle high cargo volume and few passengers.
 - “Passenger first”: Large passengers hubs with few cargo activity (Madrid, Munich, Rome, Barcelona)
 - “Balanced airports”: which have a balanced activity between passengers and cargo.
- “Cargo believers”: Small airports for cargo and passengers but having orienting their activity on cargo (an average of 60 kgs of cargo per PAX).



4. The dualisation of markets implies new kinds of services and organisation

As in several industries, the air cargo market is more and more polarised, with a trend to a bigger growth for “premium offers” on the one hand and “good value for money” at the other hand.

Air cargo market is then more and more divided between those two trends:

- The look for “premium offers”, which could be “fast and reliable” deliveries or “tailor-made” ones for specific goods (oversized, dangerous, etc.)
- The look for “good value for money” solutions, which implies processes optimizations in order to shrink costs and propose more flexible services. It’s linked to competition with other modes of transport (especially a global shift from air to sea), and the development of belly and trucking capacities.

a. Development of Premium services

THE RISE OF EXPRESS CARGO

For some highly time-sensitive goods, shippers look for fast (usually day+1) and reliable deliveries.

In that perspective, according to GEA¹¹, express cargo operators support different types of activities that are the expression of the new trends of global trade.

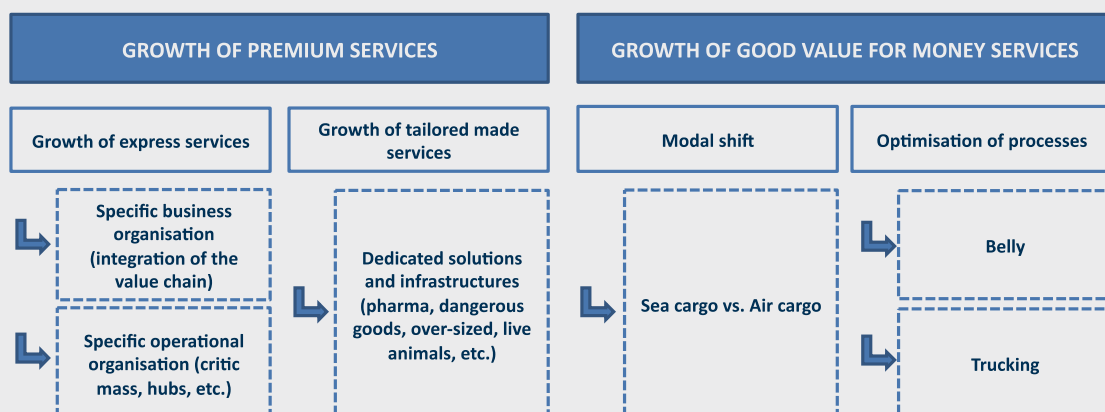
- Global companies: With globalisation, companies have been increasingly organising production of goods and services through global supply chains. Products are processed – and value is added – in many different countries. These companies have chosen to outsource their delivery and logistics to express delivery operators which ship their products between plants allowing

¹¹ Global Express Association, the association of the four major global express operators

* Arcandia Consulting

** Boeing, World Air Cargo Forecast, 2014-2015

SUMMARY OF TRENDS*



them to focus on their core domain of activity (economies of scale).

- Just-in-time manufacturers: These companies purchase from suppliers the necessary goods and material for their production to meet the demand (i.e. with no surplus production) and avoid excess inventory. Express deliveries support firms which adopt this production model.
- E-commerce firms: Many of the shipments generated by home shopping networks, catalogue shopping, and most recently, e-commerce, require specialized facilities for efficient processing and expedited delivery. Accordingly, these shipments have a greater tendency to move by air or expedited trucking. This has accelerated demand for air cargo operations in general and integrator operations in particular. Much of this market concentrates its operations on or near airports.

Hence, whereas express cargo share in the whole air cargo market is still limited, it has grown faster than the average world

air cargo, expanding 8.9% in 2012 and 5.8% in 2013.

In some mature markets, like in the US and in Europe, the share of express cargo has grown a lot since the 90's and represents today more than 50% of the market.

In order to reach their commitment for an express and reliable delivery, express operators need to align their industrial organisation by:

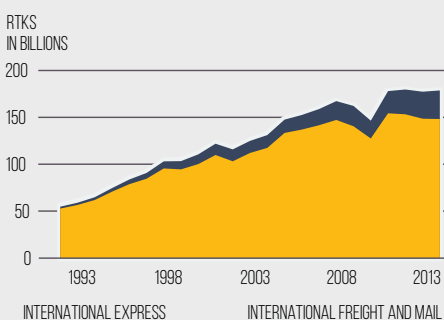
- Managing the whole value chain, on a door-to-door basis. That's why they are also called "integrators";
- Developing a large fleet and a large network of airport bases in order to be able to operate alternative routes in case of operational problems;
- Operating large shipping stations, so as to handle a large amount of parcels in little time, with direct access to runways in order to have the fastest operations as possible.

THE DEVELOPMENT OF DEDICATED SOLUTIONS

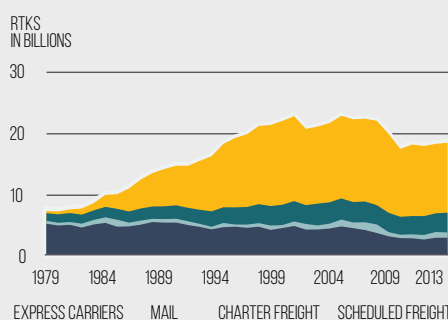
More and more cargo operators are developing dedicated methods in order

WORLD AIR CARGO FORECAST**

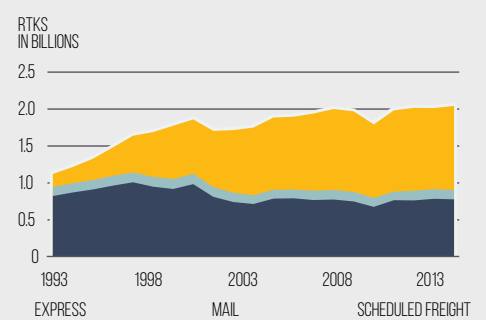
INTERNATIONAL EXPRESS MARKET SHARE REACHED 17% IN 2013



EXPRESS SERVICE DOMINATES THE US AIR CARGO MARKET



THE INTRA-EUROPE AIR CARGO MARKET RECOVERED FROM GLOBAL DOWNTURN AND THEN STAGNATED



AIR WEIGHT SHARE, 2000 - 2013, % OF AIR + OCEAN*



to propose tailored-made solutions and accommodate specific shipments, like dangerous goods, high value goods (some kinds of food, live animals, pharmacy goods, etc.) and over-sized goods (cars, big engines, pieces of assembly lines, etc.).

In that perspective, carriers are proposing special solutions and many airports are developing dedicated infrastructures (warehouses with controlled temperatures for pharmacy or food, stables and H24 vet service for race horses, etc.).

* IATA/Seabury, Mode shift: Impact and how to respond? March 2014

** IATA, Cargo strategy, 08/2015

b. Optimisation of processes in order to reach “good value for money”

AN ON-GOING “MODAL-SHIFT”

Recent years seem to show that sea is becoming a more and more important competitor to air and that some shippers decided to shift from air to sea.

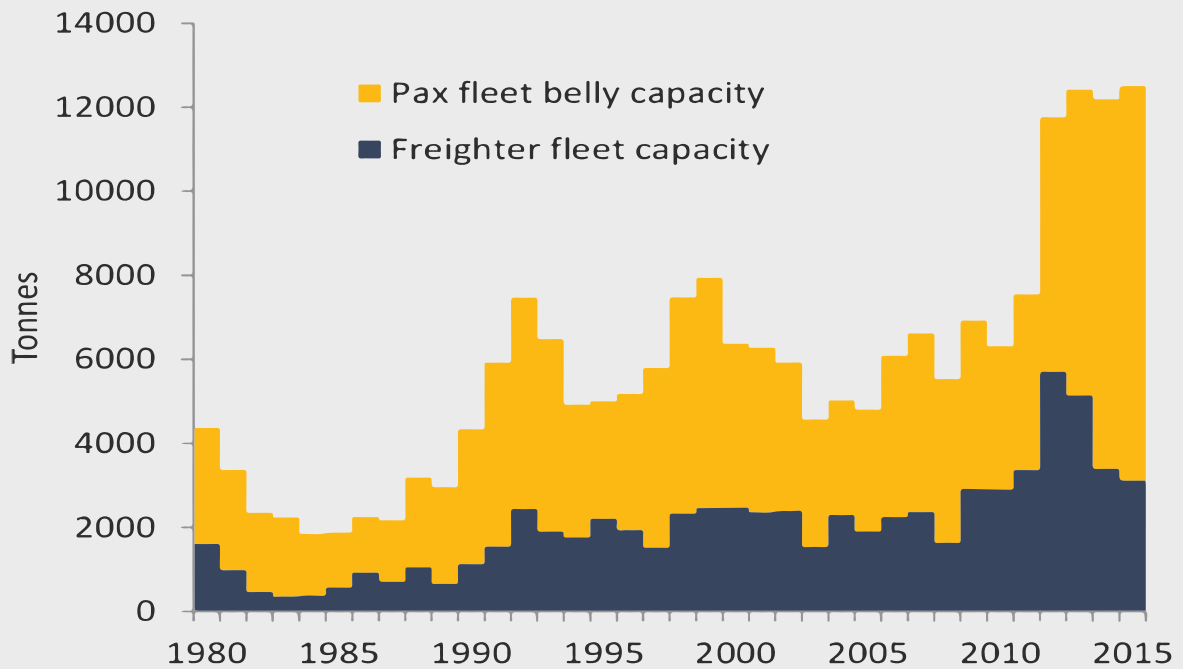
Between 2000 and 2013 growth in maritime cargo exceeded the one in air cargo by far (+7,4% million tones vs. +2,6%). As a result, the market share of air cargo is shrinking, as shown in the graph below (from 3,1% in 2000 to 1,7% in 2013).

As IATA / Seabury demonstrated in their March 2014 report, this trend is mainly due to a natural growth in demand for products that have a higher propensity to be shipped by maritime freight. This is explained by a double effect:

- A “commodity mix effect”: higher growth of “raw materials” commodities than “high tech” has caused average air share to decrease
- A “value effect”: higher demand for the “low-end t-shirts” (shipped by ocean) has caused average air share of “t-shirts” to decrease. Some High tech goods (like hard disk drives), which were usually air shipped, are today more sea shipped because they have lost value.

Other factors should also been taken into account, like the progress made by maritime

ADDITIONAL CARGO CAPACITY FROM AIRCRAFT**



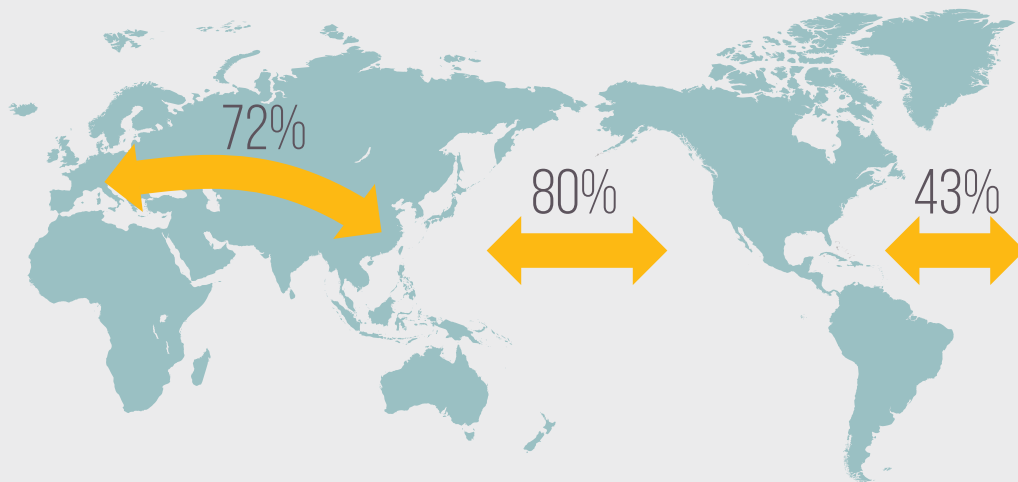
FOCUS ON EUROCAREX

The project aims to create a future European high-speed rail freight service connected to airport areas. The project is in its preparation phase and still has to be implemented. The project aims to connect Amsterdam-Schiphol, Liège, Paris-Roissy-CDG, Lyon-Saint Exupéry airports, as well as the London basin as part of the first phase. It will spread to Germany, Spain and Italy in the second phase.

Once launched, the project should allow a modal shift of the air cargo transported by trucks and short and medium-haul planes to high-speed trains. Euro Carex project should allow a reduction of the carbon footprint around the airport therefore having a positive impact on regions as a whole. However, as charges for high-speed infrastructure are high, this option risks being used only by express carriers.

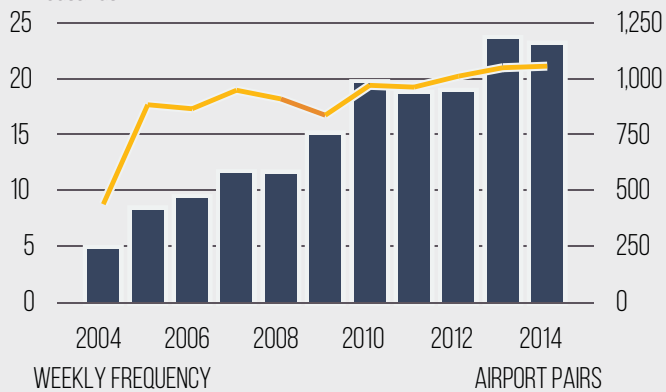
FREIGHTERS PLAY A KEY ROLE IN MAJOR EAST-WEST MARKETS*

Total air cargo traffic carried by freighters
by percentage

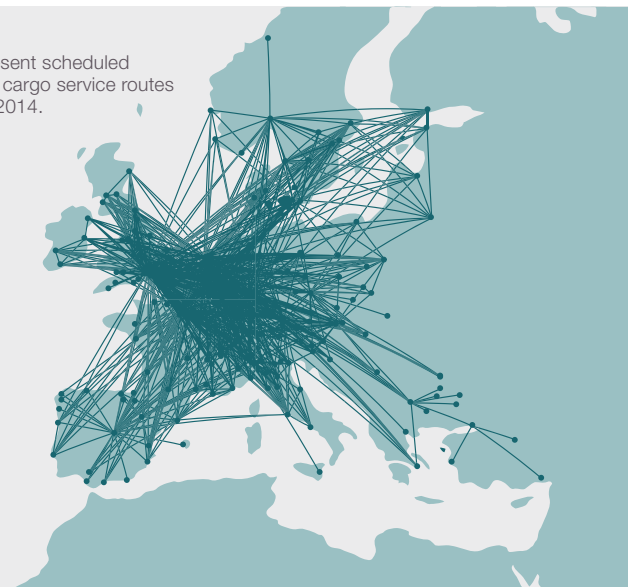


Weekly frequency
of truck flights
in thousands

Airport pairs
of truck flights



Lines represent scheduled
truck-flight cargo service routes
as of May 2014.



TRUCK-FLIGHT AIRPORT PAIRS HAVE INCREASED 2.4 TIMES*

FREQUENCY 4.9 TIMES, TRUCK FLIGHTS AUGMENT SCHEDULED AIRLINE CAPACITY*

cargo in terms of reliability, whereas airfreight security measures are considered as complex.

THE DEVELOPMENT OF BELLY SERVICES USAGE

Major passenger airlines withdraw from the full freight aircraft business (such as 747-400F for Air France and KLM). This is mainly explained by the lack of flexibility of full freighters:

- Cargo routes could be unbalanced (some flows are more important in one way than the other);
- Load factors could be difficult to maximize.

Airlines prefer to operate passenger aircraft, using their belly capacity. This trend is also favoured by new wide-body aircraft, such as the 777-300ER and 787 that have large lower-hold cargo capacities, even with a full load of passenger luggage.

As a consequence, over the last years, the additional cargo capacity from new aircraft relates more to passenger aircraft than to freighters.

At world scale about 45% of air cargo is still shipped by belly. (Details in Annex 2)

Nevertheless, full freight aircraft still play a major role. They still have a dominant position on routes between Asia and North-America and Europe.

Dedicated freighter services offer significant advantages to cargo operators. It offers:

- Predictable and reliable volumes;
- Greater control over timing;

- Ability to accommodate outsize cargo, hazardous materials, and other types of cargo that cannot be shipped with passenger airplanes;

In addition, range restrictions on fully loaded passenger flights and the limited number of frequencies serving high-demand cargo markets make freighters essential where both long-range and frequent service are required. As a consequence, freighters are still dominated the market on some routes. (Details in Annex 2)

THE DEVELOPMENT OF TRUCKING FOR MEDIUM HAUL SERVICES

Cargo operators use truck flights (trucking services registered with their own flight number) to extend their networks and add scheduling flexibility. In that perspective trucking offers door-to-door and factory-to-distribution centre service, which air transport alone cannot provide. (Details in Annex 2)

That is an important trend. In Europe, since 2004 the number of airport pairs has increased (more than doubled). And so as the weekly frequencies (nearly fivefold).

It is especially the case for:

- Final leg of an intercontinental flight. Once arrived in Europe the good is then shipped by road to its final destination
- Medium haul “flights” which are mainly operated with narrow body aircraft (A320 or B737 for example) with limited belly capacities.
- Routes where demand is too low or infrequent to make a dedicated full freight aircraft service sustainable.

* Boeing, World Air Cargo Forecast, 2014-2015

HOW IS AIR CARGO IMPACTING LOCAL COMMUNITIES?

1. *Air cargo, jobs and connectivity*

In order to understand the economic impacts of air cargo on local communities the industry usually distinguishes between:

DIRECT, INDIRECT, INDUCED (AND SOMETIMES CATALYTIC) IMPACTS

- Activities that take place at the airport (loading and unloading of cargo, work related to leasing and security, and cargo handling in the warehouse)
- Off-airport activities (can include a wide range of functions including the work of freight forwarders and customs brokers, trucking, etc)
- Expenditures by the recipients of direct and indirect wages and salaries (these spend a portion of their income on goods and services, thereby creating employment for additional persons).

IMPACTS RELATED TO THE INCREASE IN CONNECTIVITY AND NEW BUSINESS OPPORTUNITIES DUE TO AIR CARGO SERVICES

- Some firms seek for locations close to cargo airports, for example assembly lines (computers) or treatment centres (surgical instruments sterilization).
- Easy and fast deliveries solutions also help firms to access new and far away markets.

For air transport in general, the impacts on the economy can be of three types:

- Direct impacts represent the initial change in final demand for the industry sector(s) in question.
- Indirect impacts represent the response as supplying industries increase output to accommodate the initial change in final demand. These indirect beneficiaries spend money for supplies and services, which results in another round of indirect spending, and so on. Indirect impacts are often referred to as “supply-chain” impacts.



AIR CARGO IN AIRPORT REGIONS

 ECONOMIC IMPACT OF EXPRESS DELIVERY INDUSTRY*

	GLOBAL EMPLOYMENT	GLOBAL GDP IMPACT (%)
DIRECT IMPACT	585,000	0.04%
INDIRECT IMPACT	1,815,000	0.11%
INDUCED IMPACT	571,000	0.04%
TOTAL	2,971,000	0.19%

- Induced impacts are generated by the spending of households who benefit from the additional wages and income they earn through direct and indirect economic activity. The increase in income, in effect, increases the purchasing power of households. Induced impacts are also described as “consumption-driven” effects.

We can also identify some catalytic impacts (wider economic benefits), as ACI-Europe does.¹⁴ As such, air transportation facilitates employment and economic development in the national economy through a number of mechanisms like trade and investment facilitation, and productivity enhancement.

¹⁴ ACI-Europe, Intervistas, Economic Impact of European Airports, January 2015.

* Frontier Economics estimates based on data from GEA members and publicly available sources

GEA (Global Express Association, gathering the four main express cargo operators) has published an estimation of the economic impact of its activities.¹⁵

The study concludes that the express delivery industry facilitated around three million jobs worldwide in 2013. This represented 0.19% of global GDP or over \$140 billion. More in details, the express delivery industry provides almost 600,000 direct jobs and supports over 1,800,000 indirect jobs and over 570,000 induced jobs.

¹⁵ Global Express Association, Frontier Economics, *Express delivery and trade facilitation: Impacts on the global economy*, March 2015

2. Air cargo and the environment

The air cargo industry has mainly the same environmental impact as air transport in general (mainly because the majority of cargo activity uses passenger aircrafts through belly hold).

But some specificity can be outlined:

- Noise:
 - Due to hours of operations: air cargo, especially express cargo, operates during late evening and early morning hours, which creates nuisances for people living in the surroundings of the airports
 - Due to operated aircraft: cargo aircraft (full freighters) are heavy and then produce more noise than passenger ones. In some cases, cargo operators use converted aircraft (former passenger aircraft transformed into freighters). Those aircrafts could be old and then generate more noise.
 - Road congestion and road emissions: because it uses a lot trucking, air cargo activities generate pollution on the ground.

In that perspective air cargo industry is committed in a process of environmental improvement, like the rest of the air transport industry, aiming at:

- Optimising available capacity,
- Minimising adverse impacts and resource usage by creating and operating more efficient ATM systems, equipment and technology allowing to reduce CO2 emissions and noise:
 - Reduce the weight and noise of aircrafts,
 - Improvement of descent and approach to the airport (delayed flap/gear approach procedure),
 - Use alternative fuels,
 - Engine internal washing,
 - Use of GPU (Ground Power Unit) during parking.
 - Etc.

WHAT CAN LOCAL COMMUNITIES DO TO SUPPORT AIR CARGO?

At the top of the various factors influencing location decision for cargo actors, customs efficiency is usually considered among the most important as it eases trade and cargo activities.



1. Location criteria for the air cargo industry

At the top of the various factors influencing location decision for cargo actors, customs efficiency is usually considered among the most important as it eases trade and cargo activities.

In that perspective, GEA (Global Express Association) edited a Customs Capability Index (CCI) that gathers ten measures of customs capability in 139 countries.¹⁶

At the local level, three main kinds of location criteria can be outlined.

CRITERIA RELATED TO AIRPORT ENVIRONMENT

a. Catchment area

- Usually, the clients of the cargo service (the shipper and the consignee) are not set-up close to airports facilities. From their point of view, the airport is just

¹⁶ The database is accessible at <http://www.global-express.org/>

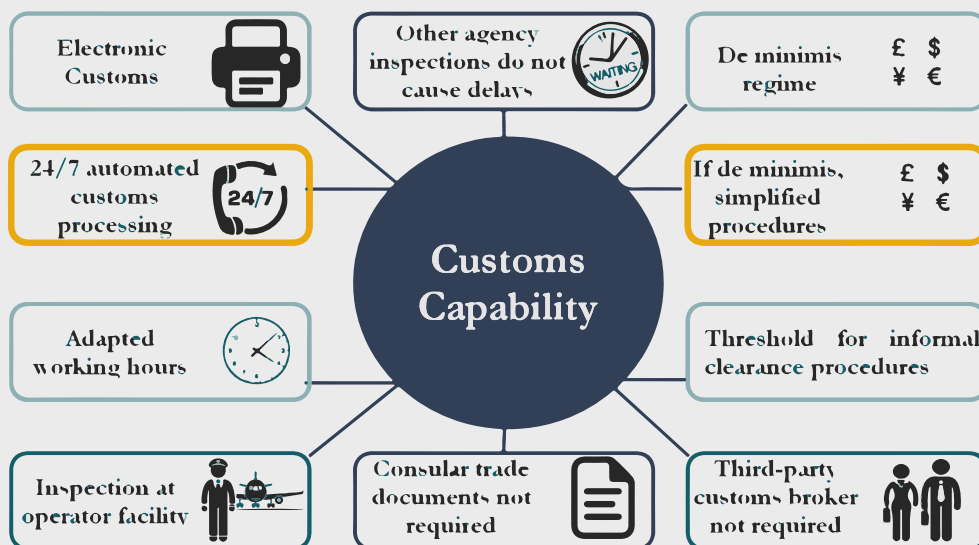
* Global Express Association

an element on the supply-chain system. So it does not really matter to them which airport is used. Their only concern is about the relationship they have with the integrator or the freight forwarder.

- For the air cargo operator, the catchment area is the “service market” (defined by a same-day transit radius, for express cargo or more for general cargo services, especially those coming with long haul flights).
- In the case of intercontinental hubs, mainly in the case of express operators, due to the share of goods transiting from an airport to another, the size of the catchment area is not a determining criterion

b. Surface access

- Like for all airport operations, surface access is important. It is especially the case for cargo, because of trucking.



- In case of express cargo, for which shortest time is the target, fluidity and reliability of the road access to airports is key.
- Rail access for goods is not developed at the moment, and cargo intermodality between air and rail is pretty rare in airports. EuroCarex project not launched yet, aims at connecting large EU cargo airports (such as Liège and CDG in a first stage) so as to ease rail shipping on medium haul continental routes.

CRITERIA RELATED TO AIRPORT INFRASTRUCTURE

a. Direct access to runways

- It's critical, especially to express operators to have direct access to runways and the ability to load aircrafts quickly. The criterion is also important for carriers using belly capacities, because the loading of cargo has to be quick and reliable in order not to delay passenger aircraft.
- In that perspective, airports must develop specific warehouses (or cargo stations) close to runways with double access, one landside (for feeding trucks) and one airside, with direct access to aprons.

b. Room for development

- Cargo operations need large facilities for consolidation

and deconsolidation of goods, especially for express operators that handle of large amount of small parcels.

- For specific goods, operators build dedicated premises (for live animals, pharmaceuticals, hazardous goods, valuables, ...) that need a lot of green field with access to the runways.

c. Security

- Security is a main concern for all actors, especially for valuable and dangerous goods. Insurance companies require high level security standards. In that perspective airports develop security system and limit the number of road and pedestrians access to cargo area, creating real "cargo cities".

CRITERIA RELATED TO AIRPORT OPERATIONS

d. H24 operations

- H24 operations are important, especially for express cargo operators which operate flights in late evening and early morning (in order to pick up the good at the client's premises at the end of the working day and deliver it at the consignee by the end of next day).
- H24 operations are less important for passenger airlines with

passenger flights that are usually operated during the day.

e. No slots

- Flexibility is key for air cargo. The constraint imposed by a slot could be a problem for operations.
- In that perspective capacity issues at airports (and delays) could put a brake to cargo operations. Thus, cargo airlines and forwarders are looking for alternative airports to serve their market demands, especially on specific markets (such as live animals shipment, luxury cars, etc.).

f. Connections with belly capacities

- A large share of air cargo is shipped by belly (even for express operators which buy capacity to passenger airlines). This is especially important to maximise the number of flight options (and when there is no scheduled cargo service).
- In that perspective, large passenger hubs do have an asset.
- Those criteria are summarized in the following table

(+: Important factor) (+: Critical factor)	Main drivers	Specific operational criteria							
		Airport environment		Airport infrastructure			Airport operations		
		Catchment area	Surface access	Direct access to runways	Room for development	Security	H24 operations	No slots	Connections with belly capacities
Shippers	Shippers (or their customers) rarely set up on-airport facilities. Therefore, shippers do not need to use airports closest to their product retail destination. So they are typically able to select among a number of airports based on service schedules and total costs.	+	+	N/A	N/A	+	+	+	+
General cargo operators									
Freight forwarders	Large freight forwarders build on hub systems at international gateways and major metropolitan markets. The need to feed a large hub consolidation center perpetuates a hub and spoke system and makes it more difficult for a new regional airport to emerge as a competitor.	++	+	+	++	++	+	+	++
Passenger airlines (mainly belly cargo)	Airport selection is heavily influenced by the expected yields on passenger traffic and cargo (but at a second level because cargo usually represent less than 15% of their total revenue).	++	+	++	+	++	+	+	++
Full cargo airlines	They usually operate on long haul high demand routes or routes with low belly cargo capacities. Their service is mainly dedicated to oversized or specific goods.	+	+	+	+	++	+	+	+
Express cargo airlines									
For premium hubs	They select airport on the volume of packages in the service area and on minimizing round-trip ground costs between the hub and their service market. Service markets are defined by a same-day transit radius, which is established by their commitment to meet the highest level of service offered—normally the next-day express option with a guaranteed delivery time.	+	+	++	++	++	++	++	+
For other airports		++	++	++	+	++	+	+	++

2. Some examples of new trends around airports and what can be done

MANUFACTURING CREEP

Manufacturing facilities, particularly those focused on time-sensitive products, in response to demand for faster delivery, are moving and/or locating key warehouse facilities closer to airports, or onto airports. This trend is also known as the “Aerotropolis” or “Airport city” concept. This reduces inventory, trucking costs, and staffing requirements, while increasing levels of customer service.

This significant and growing business segment is a major element of the concept, but is difficult to introduce to a mature airport environment, particularly when property around the airport is developed. Nevertheless, there may be opportunities to create a functioning variation of the concept on or around a number of airports.

BUILDING TECHNOLOGY

As a result of the escalating cost of storing goods, and the shortage of on-airport property, modern cargo facilities are being designed to emphasize speed of transition rather than warehousing. The result is taller buildings to handle highly mechanised equipment with sufficient depth and adequate airside and landside doors. It should be noted, however, that not every air cargo operation requires sophisticated equipment.

* Arcandia Consulting

New security requirements have required facility modifications that in some instances reduce existing floor capacity and require more internal storage.

THE CARGO VILLAGE

Perhaps the most visible recent phenomenon in the air cargo industry is the emergence of “Cargo Villages.” Despite its increasing popularity, this is simply a new name for an on-airport logistics campus. It usually includes carriers, forwarders, customs brokers, and other directly supporting services as opposed to manufacturing and assembly. These facilities may or may not attract cargo. They are usually most successful if there is an existing or strong potential market. While they have a limited marketing appeal, their value, if properly constructed is to create functional proximities that will enable tenants and users to realize cost benefits and time savings.

CENTRALIZED SCREENING FACILITIES

Because of the costs associated with screening belly cargo, independent contractors have begun developing certified screening facilities that are designed to service multiple small users including shippers, forwarders, and carriers. Using economies of scale, these facilities (best located on-airport) enable users to reduce the cost of screening, or the issues associated with retrofitting their own facilities to accommodate the screening process.



1. AIRFREIGHT TERMINOLOGY

Air Waybill (or AWB)

An AWB is a bill of lading which covers both domestic and international flights transporting goods to a specified destination. Technically, it is a non-negotiable instrument of air transport which serves as a receipt for the shipper, indicating that the carrier has accepted the goods listed therein and obligates itself to carry the consignment to the airport of destination according to specified conditions. Normally AWB refers to the Air Waybill issued by carrying airlines and also called Master Air Waybill (MAWB) which comes with three digits of numeric airline identification codes issued by IATA to non-U.S. based airlines and Air Transport Association of America to U.S. based airlines. However, air freight forwarders also issue HAWB (House Air Waybill) to their customers for each of the shipments.

Aircraft Container

A unit load device (ULD) which links directly with the airplane cargo handling and restraint system.

Allotment

A term used to describe blocked space by airlines on behalf of forwarders/shippers.

ATA

Actual Time of Arrival, or Airport-To-Airport, or Air Transport Association of America.

ATD

Actual Time of Departure.

Bonded Warehouse

The Customs Service authorizes bonded warehouses for storage or manufacture of goods on which payment of duties is deferred until the goods enter the Customs Territory. The goods are not subject to duties if re-shipped to foreign points.

Carnet

A customs document permitting the holder to carry or send merchandise temporarily into certain foreign countries for display, demonstration or other purposes without paying import duties or posting bonds.

Combi Aircraft

An aircraft configured to carry both passengers and cargo on the Main Deck.

Consignment

Delivery of merchandise from an exporter (the consignor) to an agent (the consignee) under agreement that the agent sell the

merchandise for the account of the exporter. The consignor retains title to the goods until sold. The consignee sells the goods for commission and remits the net proceeds to the consignor.

Consolidation

In order to handle small lot of consignment efficiently and competitively, freight forwarder usually put many consignments into one lot then tender to carrier for forwarding. In this case, each consignment will be shipped with one HAWB respectively and all of them will be under one master AWB.

Customs

The government authorities designated to collect duties levied by a country on imports and exports.

Customs Broker

An individual or company licensed by the government to enter and clear goods through Customs. The U.S. Customs Service defines a Customs Broker, as any person who is licensed in accordance with Part III of Title 19 of the Code of Federal Regulations (Customs regulations) to transact Customs business on behalf of others. Customs business is limited to those activities involving transactions with Customs concerning the entry and admissibility of merchandise; its classification and valuation; the payment of duties, taxes,

or other charges assessed or collected by Customs upon merchandise by reason of its importation, or the refund, rebate, or drawback thereof.

Customs Clearance

The procedures involved in getting cargo released by Customs through designated formalities such as presenting import license/ permit, payment of import duties and other required documentations by the nature of the cargo such as FCC or FDA approval.

Customs Invoice

A document, required by some foreign countries' customs officials to verify the value, quantity, and nature of the shipment, describing the shipment of goods and showing information such as the consignor, consignee, and value of the shipment.

Dangerous Goods

Commodities classified by IATA according to its nature and characteristic in terms of the effect of its danger to carrier's flying safety.

Dimensional Weight

Carrier charge for freight based on the dimensional weight or actual gross weight whichever is higher.

Drawback

Drawback is a rebate by a government, in whole or in part, of customs duties assessed on imported merchandise that is subsequently exported. Drawback regulations and procedures vary among countries.

EDI

EDI, Electronic Data Interchange for Administration, Commerce, and Transportation, is an international syntax used in the interchange of electronic data. Customs uses EDI to interchange data with the importing trade community.

ETA

Estimated Time of Arrival. Then, It normally takes 3 hours for carriers to Break Bulk then ready to be picked up by forwarders along with customs release notification.

ETD

Estimated Time of Departure. The cut-off time for carriers' cargo ramp handling is normally two hours ahead of ETD. However, the freight forwarders' consolidation cut-off time may vary depending on each forwarder's operations respectively.

Freight Carriage ... paid to

"Freight/Carriage paid to ..." means that the seller pays the freight for the carriage of the goods to the named destination. However, the

risk of loss of or damage to the goods, as well as of any cost increases, is transferred from the seller to the buyer when the goods have been delivered into the custody of the first carrier and not at the ship's rail. The term can be used for all modes of transport including multi-modal operations and container or "roll on-roll off" traffic by trailer and ferries. When the seller has to furnish a bill of lading, waybill or carrier's receipt, he duly fulfills this obligation by presenting such a document issued by the person with whom he has contracted for carriage to the named destination. (Also see incoterms)

Freight Carriage ... and Insurance paid to

This term is the same as "Freight/Carriage Paid to ..." but with the addition that the seller has to procure transport insurance against the risk of loss of damage to the goods during the carriage. The seller contracts with the insurer and pays the insurance premium.

Gateway

In the context of travel activities, gateway refers to a major airport or seaport. Internationally, gateway can also mean the port where customs clearance takes place.

Harmonized System

The Harmonized Commodity Description and Coding System (or Harmonized System, HS) is a system for classifying goods in international

trade, developed under the auspices of the Customs Cooperation Council. Beginning on January 1, 1989, the new HS numbers replaced previously adhered-to schedules in over 50 countries, including the United States.

HAWB

House Air waybill issued by carrying airlines' agent, normally freight forwarder.

IATA

International Air Transport Association (IATA), established in 1945, is a trade association serving airlines, passengers, shippers, travel agents, and governments. The association promotes safety, standardization in forms (baggage checks, tickets, weigh bills), and aids in establishing international airfares. IATA headquarter is in Geneva, Switzerland.

IATA Designator

Two-character Airline identification assigned by IATA in accordance with provisions of Resolution 762. It is for use in reservations, timetables, tickets, tariffs as well as air waybill.

Import Certificate

The import certificate is a means by which the government of the country of ultimate destination exercises legal control over the internal channeling of the commodities covered by the import certificate.

Import License

A document required and issued by some national governments authorizing the importation of goods. Also referred as import permit. With such documentation, customs clearance can be conducted.

Import Restrictions

Import restriction, applied by a country with an adverse trade balance (or for other reasons), reflect a desire to control the volume of goods coming into the country from other countries may include the imposition of tariffs or import quotas, restrictions on the amount of foreign currency available to cover imports, a requirement for import deposits, the imposition of import surcharges, or the prohibition of various categories of imports.

Incoterms

Maintained by the International Chamber of Commerce (ICC), this codification of terms is used in foreign trade contracts to define which parties incur the costs and at what specific point the costs are incurred. (also see incoterm section).

Insurance Certificate

This certificate is used to assure the consignee that insurance is provided to cover loss of or damage to the cargo while in transit.

Intermediate Consignee

An intermediate consignee is the bank, forwarding agent, or other intermediary (if any) that acts in a foreign country as an agent for the exporter, the purchaser, or the ultimate consignee, for the purpose of effecting delivery of the export to the ultimate consignee.

Intermodal

Movement of goods by more than one mode of transport, i.e. airplane, truck, railroad and ship.

LD3

Lower deck type 3 container. This is the most commonly used container in passenger aircraft.

Lower Deck

The compartment below the Main Deck (also synonymous with lower hold and lower lobe).

Main Deck

The deck on which the major portion of payload is carried, normally known as Upper Deck of an airplane. The full cargo freighter aircraft has its entire upper deck equipped for main deck type of containers/pallets while Combi aircraft uses its rear part of the upper deck for cargo loading. There is no upper deck or main deck type of container/pallet at passenger aircraft.

NVD

No Value Declared.

Packing List

A shipping document issued by shipper to carrier, Customs and consignee serving the purposes of identifying detail information of package count, products count, measurement of each package, weight of each package, etc.

POD

Proof Of Delivery, or a cargo/package receipt with the signature of recipient. This term has been widely used in courier and express industry and also gaining more attention and implementation at air cargo industry..

Pro Forma Invoice

An invoice provided by a supplier prior to the shipment of merchandise, informing the buyer of the kinds and quantities of goods to be sent, their value, and important specifications (weight, size, and similar characteristics). When an importer applies for Letter of Credit as the means of payment, a Pro Forma Invoice from the beneficiary of such Letter of Credit, usually the exporter, is required by the L/C issuing bank.

Shipping Mark

The letters, numbers or other symbols placed on the outside of cargo to facilitate identification.

Shipping Weight

Shipping weight represents the gross weight in kilograms of shipments, including the weight of moisture content, wrappings, crates, boxes, and containers (other than cargo vans and similar substantial outer containers).

TACT

TACT stands for The Air Cargo Tariff. It is published by IAP – International Airlines Publications, an IATA company.

Tare Weight

The weight of a ULD and tie down materials without the weight of the goods it contains.

Temporary Importation under Bond

When an importer makes entry of articles and claimed to be exempt from duty under Chapter 98, Subchapter XIII, Harmonized Tariff Schedule of the United States, a bond is posted with Customs which guarantees that these items will be exported within a specified time frame (usually within one year from the date of importation). Failure to export these items makes the importer liable for the payment of liquidated damages for breach of the bond conditions.

Transshipment

Transshipment refers to the act of sending an exported product through an intermediate country before routing it to the country intended to be its final destination.

ULD

Unit Load Device, Any type of container, container with integral pallet, aircraft container or aircraft pallet.

Ultimate Consignee

The ultimate consignee is the person located abroad who is the true party in interest, receiving the export for the designated end-use.

Value for Customs Purposes Only

The U.S. Customs Service defines “value for Customs purposes only” as the value submitted on the entry documentation by the importer which may or may not reflect information from the manufacturer but in no way reflects Customs appraisal of the merchandise.

Without Reserve

A term indicating that a shipper’s agent or representative is empowered to make definitive decisions and adjustments abroad without approval of the group or individual represented.

2014 TOP 10 FREIGHT AIRLINES WORLDWIDE*

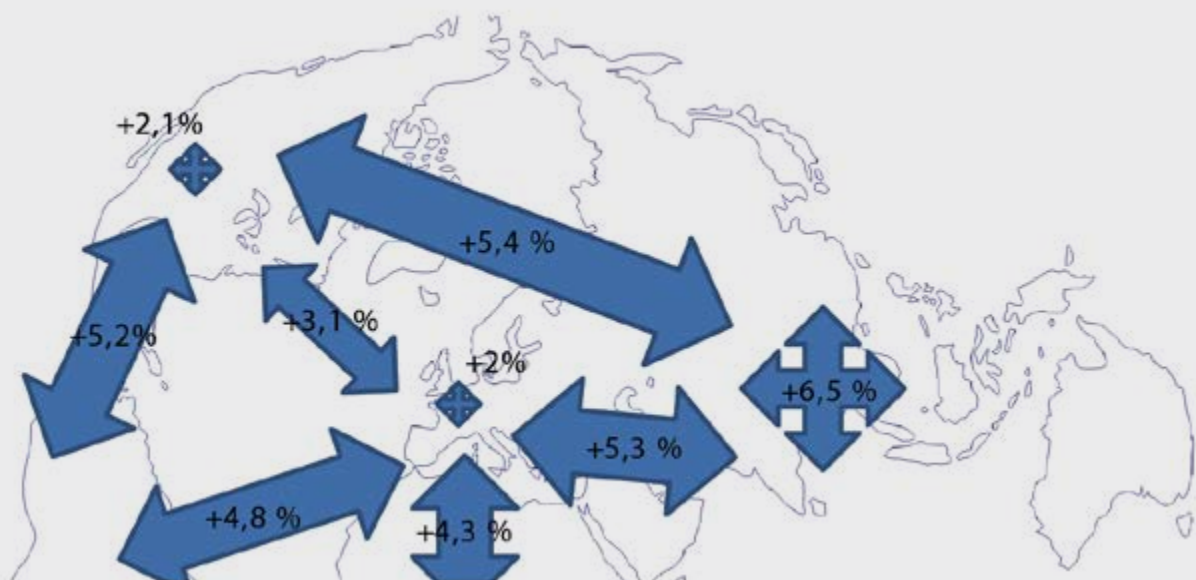
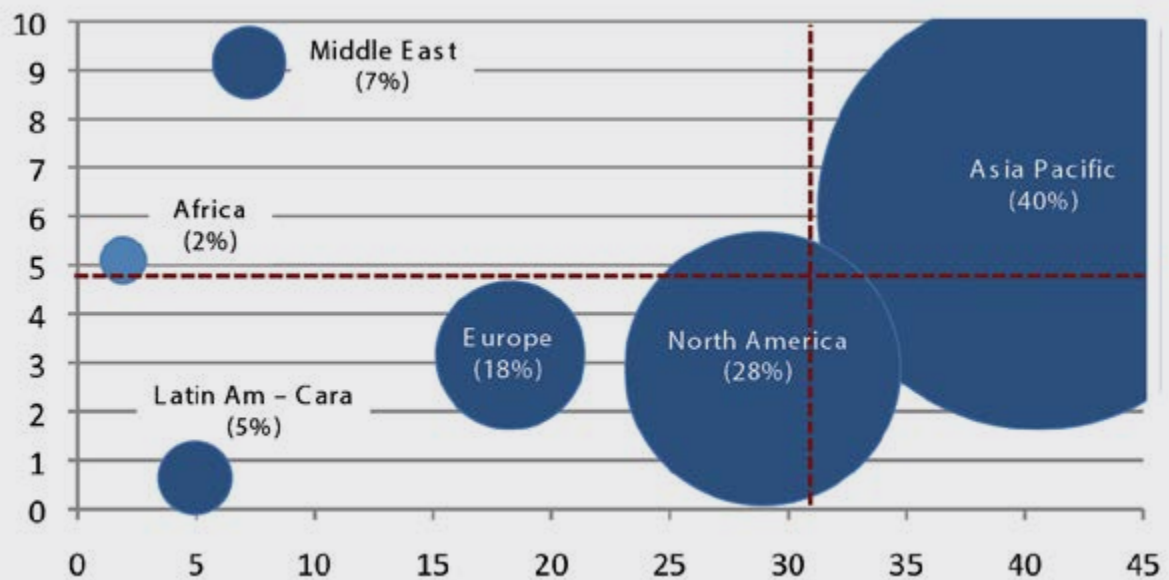


	UPS	FEDEX	DHL	TNT	Emirates
					
HQ	Atlanta	Memphis	Bonn	North Holland	Dubai
Main hub in Europe	Cologne	Paris	Leipzig	Liège	NA
Fleet	237 (+ 302 chartered aircraft)	652	250	54	15 freighters (+ 240 widebodied aircraft)
Revenus	58,2 MM (\$)	27,2 MM (\$)	12,49 MM (€)	6,6 MM (€)	-
Employees	435,000	165,000	325,000	53,300	-
Network	12 hubs 346 airports (intl)	10 hubs 375 airports (intl)	3 hubs 500 airports	6 hubs	1 hub 149 destinations (including 15 dedicated freighters)

Source: Copernic webistes
Adaptation: Arcandis Consulting

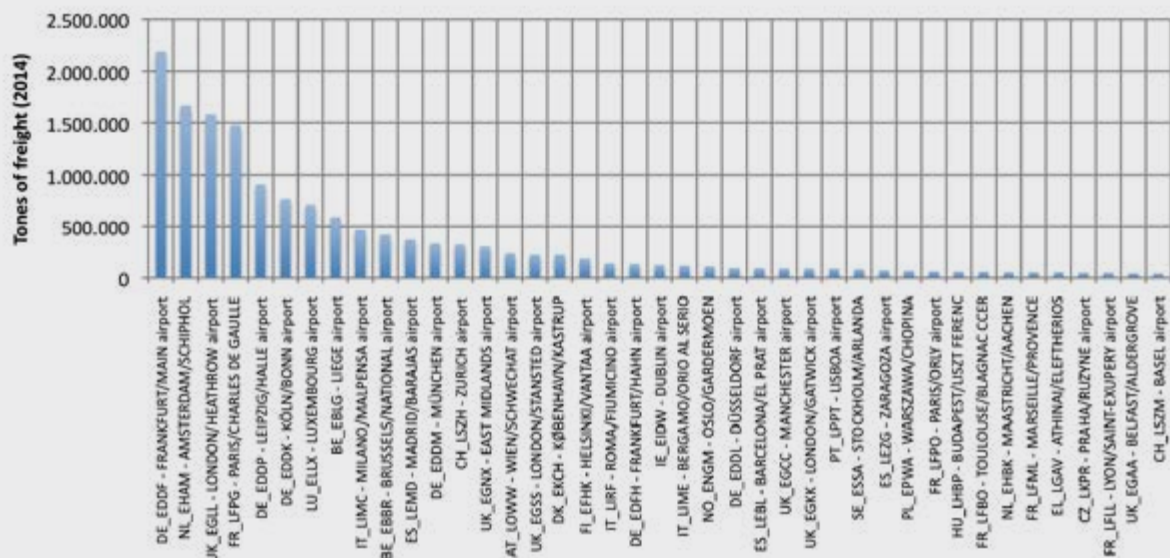
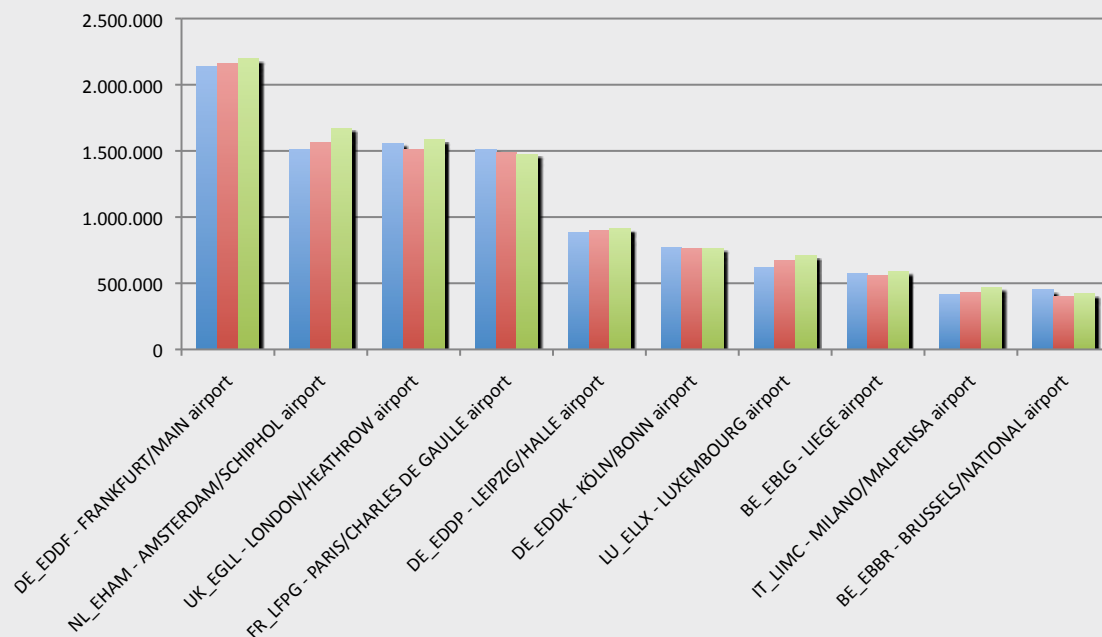
SOME OF THE MAIN CARGO AND FREIGHT OPERATORS**

GROWTH OF CARGO PER GEOGRAPHICAL AREA***



ANNUAL AIR CARGO GROWTH (2014-2033, IN REVENUE TON KILOMETERS)****

EVOLUTION OF VOLUMES AT THE MAIN EUROPEAN CARGO AIRPORTS (2012, 2013, 2014)*****



A VERY POLARISED EUROPEAN CARGO MARKET*****

Graph data sources:

- * WATS 59
- ** Eurostat
- *** Arcandia Consulting
- **** Boeing
- ***** Eurostat
- ***** Eurostat



AIR CARGO
