

# AIR CARGO EUROPE II

## Belly cargo capacity sticks out at European airports – an irreversible trend?

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Pinning down the cargo trend amongst  
Europe's mid-sized airports

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## Preface

We are pleased to send you our second analysis on developments of Air Cargo in Europe. Last year we started with our first research, which resulted in a few remarkable conclusions and expectations, based upon an experts' view. In this analysis we further investigate whether these expectations/conclusions have become more visible, with a focus on the cargo development on mid-sized<sup>1</sup> European Airports.

As consultants, we recently successfully executed several interesting projects in the field of Aviation and Air Cargo Logistics. For the Dutch Ministry of Transport we executed a second opinion on the business case of Lelystad Airport in the Netherlands, pre-destined to become the number two passenger airport. For Brussels Airport Company we executed the so-called "BRUcargo Secured Gateway" project and for Schiphol Area Development Company we conducted an in-depth market research on the potential of the development of a logistical business park nearby Amsterdam Airport Schiphol. Furthermore, we extended our product portfolio by establishing partnerships with senior experts in the field of Passenger & Cargo Airport Development, Master Planning and Commercial Airport Real Estate Development.

As Stratagem Consulting for all of our projects, we build on the following principles:

- Reliability: a relationship with our clients based on respect and integrity
- Fact based: we perform our analysis and draw our conclusions based on facts
- Independent: solutions presented as we see it
- Looking backward: trying to reveal the question behind the question
- Looking forward: seeking for perspectives
- Perspective for actions: translate perspectives into actions

We thank everyone who has participated in his study. We have indicated that we would handle the information provided to us anonymously, which we have. If you are interested in further information, please do not hesitate to contact us. In relation to our principle of mutual exchange of information and expertise, we are looking forward to your opinion of and remarks on our document and further ideas you might have on these subjects as well.

Yours Sincerely,

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<sup>1</sup> Airports with a yearly cargo volume up to 400.000 tonnes

# Belly cargo capacity sticks out at European Airports – An irreversible trend?

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## 1 Air cargo in Europe

### 1.1 Conclusions 2013 survey and origins of this briefing

In 2013 we held a survey amongst more than thirty players<sup>2</sup> in the air cargo chain, resulting in a report focussed upon the trends and expectations of the European air cargo industry towards the intermediate future<sup>3</sup>. The main conclusions of this research were the following:

1. Full freighter capacity (as operated by the traditional combination flag carriers) had come to an end and most - if not all - were shrinking their freighter assets. European full-freighter carriers continued to be loss-making and facing a grim future; as a smaller player, forced into partnerships or different (foreign) ownership or disappearing altogether.
2. Cargo managers of the main European cargo airports expected an average growth of about zero to three percent for the coming three to five years, which can be considered as a break in the trend.
3. Opinion differs about the impact of increasing belly capacity by for example Boeing 777 passenger operators at secondary airports. On the one hand there is a believe that those carriers will attract regional cargo which will affect the volumes of the main gateways, others think that particularly based on volume/yield ratio's and trucking systems the impact on the Europe's main airports will be limited.

Based on the experts' expectations our conclusions were: lower growth rates of the cargo *main ports*, flag carriers shrinking their (freighter) fleets and new players and aircraft types entering the European arena, especially at mid-sized European airports. Therefore, we were interested to see how fast this pattern of growing intercontinental belly capacity would spread out across Europe's mid-sized airports and what the impact of these trends would be on the European air cargo main ports.

### 1.2 Methodology of this briefing

While our 2013 report was based upon a large reference group and focussed on the main airports<sup>4</sup>, our current report pinpoints nine mid-sized European airports, which - geographically seen - stretches from Scandinavia, through to Central and Eastern Europe: representing the 'middle' of Europe. We started the background of this briefing through desk research. Subsequently, we contacted the targeted mid-sized nine airports, sent a short questionnaire and interviewed most airports by phone. Furthermore, we categorized all the information gathered and drew our conclusions. Finally, we come up with a few considerations. We have included the listing of both groups as an attachment and included the questionnaire as well.

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<sup>2</sup> Airport Cargo Managers, Freight Forwarders, Cargo Handling Companies, Cargo Real Estate Developers, Cargo Airlines and Cargo Trucking Companies

<sup>3</sup> Market trends and observations on Air Cargo in Europe – A Stratagem Briefing (2013)

<sup>4</sup> Airports with a turnover of over 400.000 tonnes per year

## 2 Cargo Developments

### 2.1 Air cargo growth at European Airports

In 2013, of the Top 10 European cargo airports<sup>5</sup>, none had reached their 2007 or 2010 (the short-lived 'peak' before the Euro-crisis) record levels. In fact, the total for these airports in 2013 was a small negative number, with some performing well (Frankfurt and Amsterdam) while others had negative growth (Paris, Brussels). In total, five of the nine main cargo airports mentioned had a negative growth, including two Top 4 airports. The European mid-sized airports interviewed by us fared better, with seven out of nine with plusses. The combined growth in volume for these nine airports was +3%. This group of airports represents a total of almost 1,2 million tonnes of air cargo, versus the approximately 9,7 million tonnes of the Top 10.

**Top 10 European airports - 2013/12 (cargo in tonnes) \***

	Frankfurt FRA 1	Paris CDG 2	Amsterdam AMS 3	London LHR 4	Cologne CGN 6	Luxembourg LUX 7	Liege LGG 8	Brussels BRU 9	Milan MXP 10	TOTAL
2013	2.048.729	1.875.569	1.531.089	1.423.013	739.553	673.500	561.000	429.938	421.300	9.703.691
2012	2.020.367	1.949.660	1.483.448	1.464.550	751.183	614.905	576.664	459.265	405.877	9.725.919
in %	1,4%	-3,8%	3,2%	-2,8%	-1,5%	9,5%	-2,7%	-6,4%	3,8%	-0,2%
growth	28.362	(74.091)	47.641	(41.537)	(11.630)	58.595	(15.664)	(29.327)	15.423	(22.228)

\* Excluding Leipzig-Halle - air cargo exclusive of mail

**Mid-Sized European airports - 2013/12 (cargo in tonnes)**

	Copenhagen CPH	Munchen MUC	Vienna VIE	Stockholm ARN	Düsseldorf DUS	Prague PRG	Warsaw WAW	Lyon LYS	Hamburg HAM	TOTAL
2013	363.000	270.000	179.336	131.572	80.517	51.902	48.200	42.160	24.496	1.191.183
2012	354.269	272.000	176.593	128.363	71.112	52.978	45.400	33.460	23.906	1.158.081
in %	2,5%	-0,7%	1,6%	2,5%	13,2%	-2,0%	6,2%	26,0%	2,5%	2,9%
growth	8.731	(2.000)	2.743	3.209	9.405	(1.076)	2.800	8.700	590	33.102

### Conclusions based upon the figures:

#### A. Top 10 Airports:

1. The Top 10 Airports had an overall average negative growth of -0,2%.
2. A growth of 3-5% has been attained by 3 airports, whilst figures of 5 airports were negative.
3. Of the Top 4 airports, Paris and London Heathrow showed substantial negative growth.

#### B. Mid-sized Airports:

1. An overall average growth percentage of + 2,9%.
2. Of the nine airports, only two airports scored negative.
3. One airport even scored a plus 28%.
4. Mid-sized airports added more general cargo volume in 2013 than the Top 10 Airports

The mid-sized airports gave indications that they did particularly well in the second half of 2013 and expect this to continue into 2014. Of course, mathematically it is easier to grow from a low base figure, allowing the mid-sized airports to post growth figures ranging from 3-8%. However - as an example - an additional intercontinental daily passenger flight can easily push growth figures of such an airport into double digits, which was the case at Düsseldorf and Lyon Airport.

Although we have not received figures for all of the mid-sized airports yet, the average growth realized in the first half of 2014 is over 5%. Growth for the bottom half of the Top 10 table has been around 6% for the same period. Growth figures for the Top 4 for the first half of 2014 show +4,5% , where a remarkable 8,8% at

<sup>5</sup> Excluding Leipzig-Halle an airport dedicated to one express operator, with a high percentage of intra-European cargo

Amsterdam pulls up the +3%-average of the other three. However, given the discussion about Air France KLM's cargo short-term strategy - as outlined below in paragraph 2.2.3 - the question for Amsterdam Airport Schiphol will be whether and how they will be able fulfil their growth ambitions.

Although from a statistical point of view it is too early to draw reliable conclusions, to our opinion the first signals of a growing cargo potential of the mid-sized European airports are showing.

## 2.2 Airline Market Trends: belly capacity up, freighter capacity down

### 2.2.1 General developments

Not too long ago, 15 to 18 year-old Boeing 747-400's and MD-11's were converted into freighters, but these machines are being made redundant because of the low yield of cargo and high fuel cost of these 'old' converted machines. The previous generation of wide-body conversions spent an additional 20 years as a freighter, whereas the current generation - especially Boeing 747-400's - will either not be converted or be scrapped after conversion even before turning thirty.

With aircraft like the Boeing 777 delivering increased cargo capacity from the nineties replacing older intercontinental types, we now are about to face another step-up with the introduction of Boeing 787, Boeing 777-8 and -9 and Airbus A350 aircraft. These are making their way into international point-to-point traffic, opening up new destinations alongside the classic gateways.

When looking at the Airbus and Boeing order books, one cannot fail to conclude that the expansion of the carriers from the Middle East and Asia Pacific will happen at a much faster pace than European fleets. An example being the A350, with the first of 750 ordered yet to be delivered. Airlines from the Middle East and Asia Pacific have ordered 400 units, whereas in Europe, ten airlines have ordered 140 A350s, half of these on order by Air France KLM, Lufthansa and British Airways. Meanwhile, in the Middle East, Etihad and Qatar Airways have together ordered 142. Changing to the US manufacturer, the biggest Boeing order of the year came from Emirates, who ordered an *additional* 150 Boeing 777s on top of an existing order book for 100+ wide bodies. 'Smaller' orders for 50 777's and 101 787's by Etihad Airways and Qatar Airways add up to a total of 450 wide bodies on order by the three largest Middle Eastern carriers.

### 2.2.2 Full Freighter development at the Main ports and Mid-Sized Airports

Our research shows that the number of full freighters at the main hubs is still at a lower level than five years ago and dedicated freighters to smaller airports, a trend amongst Asian carriers in the recent past, have been severely curtailed because of lesser demand, examples being Singapore Airlines and Korean Airlines. Japan Air Lines even left the freighter market in 2010. Bucking this trend, Emirates and Qatar also have introduced medium-sized freighters both to main hubs (Amsterdam and Frankfurt) as well as to mid-sized airports (e.g. Liege, Lyon, and Oslo). At one point the full freighter/pax share at for example Frankfurt and Amsterdam was almost 60/40, but has now reversed. At most smaller airports the belly-share is now in the upper eighties, with the remainder of the cargo 'pie' made up by intra-European express operations.

### 2.2.3 Flag Carrier full freighter developments

Lufthansa Cargo (LH), the largest cargo entity within a major European airline group, announced an order for 5 new Boeing 777F's in 2011. At the time it was presented as an expansion of the fleet. However with declining economies in 2012 and 2013 their 18-strong MD-11 fleet was operated as a 16-unit fleet and after the first two B-777Fs were delivered, two MD-11F's were retired. In 2014 another two B-777F's have been delivered and at least one more MD-11F has been retired. At this point it has become clear that LH is not expanding its fleet, but balancing capacity and demand at around 18 aircraft<sup>6</sup>, the projected number by the end of 2015.

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<sup>6</sup> Lufthansa Cargo also has a joint venture with DHL, called Aerologic, a German operator with 8 B-777F's on North-American-European-Asian routes.

In September 2014, Air France KLM reported a drastic cut in their remaining fleet of 10 all-cargo aircraft in order to stem the losses of the Cargo division. It was said that € 100 m. of the € 200 m. loss (2013) of the cargo division could be attributed to the freighter operation. All of Martinair's MD-11 freighters are to be decommissioned, while three B-747-400ERFs are to remain operational at Schiphol and two B-777F's to be operated from Paris CDG. A very much slimmed-down operation will therefore remain, most likely to be implemented within one year. It remains to be seen what the market position of Air France KLM Cargo will become after this (penultimate?) withdrawal and how Amsterdam Airport Schiphol will cope with loss of markets served and capacity.

At IAG Cargo, British Airways ended its subcontracted full freighter operation in April 2014, citing the general outlook for airfreight demand and ample (new) belly capacity available within their own fleet.

All in all, home-carriers at the 4 main ports have cut (BA), decimated (AF/KL/MP) or stabilized (LH) their freighter fleets in recent years. It appears that especially the three largest continental cargo hubs see their freighter numbers go down and find themselves at the grace of (new) foreign operators.

However, in the same timeframe when European carriers were facing stagnation, fleet reduction - as mentioned above - and suffered operational losses, three major players from the Middle-East: Emirates, Etihad and Qatar – Middle-East Big 3, or MEB3 – were introducing new intercontinental passenger flights to mid-sized European airports, not necessarily being the countries' capital. Examples of these being Emirates to Hamburg or Etihad to Munich.

Finally, we have seen that many legacy European airlines have not survived as independent units and some are still fighting for survival. Many have been taken over by or merged with another European airline (Austrian and Swiss by Lufthansa, KLM – Air France, Iberia – British Airways), or by a non-European carrier in the case of Czech Airlines (Korean Air) and Alitalia and JAT by Etihad. The pressure is still on with SAS to slim down and restructure, whereas others like LOT and TAP are up for sale. These legacy airlines are being 'eaten up' from two ends, with low cost carriers biting into their European traffic and Asian and Middle-East carriers providing intercontinental competition. It seems that setting up low-cost daughters and joining international alliances has not provided all the answers needed for European flag carriers.

#### **2.2.4 Intercontinental low-cost cargo: a new belly-carrying segment?**

Traditionally, intra-European orientated Low Cost Carriers do not take cargo or provide long-range intercontinental flights. However, Low Cost Carrier Norwegian Air System has ordered 17 Boeing 787's, started intercontinental flights to the U.S. in 2013 and expanded flights to other continents in 2014. They will also take on belly cargo which could have a positive impact on mid-sized airports like Oslo, Stockholm and Copenhagen (but will interfere with SAS Cargo market share).

Internationally, there is also an interest to enter the long-haul low-cost market. With a large order of 50 Airbus A330neo's during Farnborough 2014, AirAsia X will be one of the new players opening up new low-cost long-haul routes into Europe in the near future, and not surprisingly they also take on cargo as a product. Given the airline profile and aircraft size, we think AirAsia X will also operate from mid-sized European airports.

### **3 Origins of growth**

#### **3.1 Mid-sized airports' new entrants and their equipment**

With lower economic growth - up till 2011 - new routes or larger equipment were out of the question. With airlines fiercely trying to offload their competitors of passengers, some have tried to carve a niche by going to smaller airports, evading competition at the larger airports or increasing feed into their hub. This enables them to profit from support from that airport, region or country. Initially trying to figure out the market with three to

four weekly frequencies operated by e.g. an A330, most of these routes have been extended into daily flights, now mostly served by B-777s. For cargo there is a related opportunity, where the catchment area of regional and mid-sized airports is extended further out as a consequence of direct flights to and from these airports.

All nine interviewed mid-sized European airports have seen new or extra passenger flights of the MEB3 at their airports in the past years, some have even reached the point of double daily flights within only a few years' time. This summer, the MEB3 fly to eight capitals in continental Europe and to six mid-sized European airports. Five of these fourteen airports also have MEB3 freighters operating, three of these remarkably being mid-sized airports, confirming the trend of a higher interest in these airports. Another six mid-sized airports have attracted only freighter operations by the MEB3. As a seemingly continuing trend, in September 2014 Oslo, Brussels and Budapest welcomed new passenger flights by Emirates, while Brussels added a Qatar Airways full freighter (airport change from Liege). Most of the passenger routes are being flown by Boeing 777 and Airbus A330/340. Some are even being upgraded to Airbus A380, whereas the Airbus A350 and Boeing 787 will make their appearance from next year on. All of these aircraft have a sizeable belly cargo carrying capacity, giving airports an accelerated cargo growth opportunity with each daily frequency added.

During the European monetary crisis - following the worldwide crisis of 2007/8 - most Asian economies and (intra) Asia air traffic kept on growing. Especially the Chinese economy held on to high growth figures for a considerable time. The ever larger group of middle-class Chinese with a propensity to travel is reflected by new and increased intercontinental flights in recent years by Air China towards three airports of our mid-sized target group, together with other Asian carriers like Thai Airways, ANA and Korean Airlines. Also several US carriers have started new European services, although some operate only during the summer season.

### **3.2 Reflections on freight forwarders and trucking companies**

Freight forwarders have more and more started collecting cargo at designated gateways or hubs. Especially in Germany large forwarders are still concentrating their businesses on the main hubs based on their Gateway concept, whereas forwarders in for example Scandinavia are supporting the build-up of new intercontinental belly capacity by routing cargo to their base airports, thereby supporting local flights. While we have seen a very active connection between airport owner/developer and forwarder community at airports like Brussels, Munich and Amsterdam, the majority of mid-sized airports has no direct insight into the movements or requirements of their logistics service suppliers, usually located in business parks surrounding the airport. Two of our interviewed airports (Hamburg and Vienna) have reported new forwarder facilities at their airport. Several other mid-sized European airports report a stronger interest in office space demand by international forwarders. This could be seen as a first step of increased interest for the mid-sized airports and its region.

Although the recent economic crisis has been especially tough on general cargo road transport companies, the air cargo trucking community by and large has survived. Especially the large, diversified companies (e.g. Essers, Wallenborn, Jan de Rijk Logistics) have been instructed by their principals to maintain at least the core (daily) network, albeit with lower frequencies and capacity. A relatively new customer group for these companies are the global logistics companies, who have outsourced some of their trunk air cargo routes to them. Any airport's catchment area could shrink if there is a (new) intercontinental connection at a competing airport. This seems to be true both for the larger European airports as well as for regional competitors. This trend could also pave the way to a more sustainable cargo distribution throughout Europe. Building up capacity and capability locally will mean more airports will be able to compete for (their own regions) air cargo in the future, possibly resulting in a reduction of trucking stage lengths.

Most of our targeted mid-sized airports confirm a growth of 5-7% annually for their trucking operation. Existing trucking networks are usually aimed at collecting cargo for the main hubs, but some routes are now used also to deliver cargo at the other end of the pipeline. Our target group reports more incoming trucked air cargo, but also increased local delivery feeding into (new) intercontinental connections the airport. For most airports, large and small, tracing trucking movements and volumes remains almost impossible.

## 4 Conclusions and Considerations

### Conclusions

A few trends and expectations out of our 2013 research became or seem to become visible:

- The strong position of European flag carriers in the full freighter market definitely has come towards an end. The latest news of Air France KLM's cargo strategy, the reduction or abandoning of full freighter fleets by other flag carriers is confirming this trend;
- Intercontinental cargo belly connections via mid-sized European airports have increased and in general resulted in an accelerated growth of cargo uplift via these airports;
- So far we could not verify (statistically) whether this uplift is being taken out of the European main airports' cargo pie. On the other hand, one could ask the question, if there was no increase of cargo uplift cargo capacity via mid-sized airports, was uplift via one of the main ports not the only option?;
- Freight Forwarders in general still focus on the main ports. However, a few mid-sized airports mentioned a growing demand for office space and also warehousing space by forwarders. This could be a first signal of increasing commercial interest to support the existing and future belly capacity at mid-sized airports by forwarders;
- All in all there is an increased interest in cargo at medium-sized European airports both by airlines (e.g. MEB freighters to medium- and smaller European airports) and forwarders alike.

### Considerations

- For larger airports, existing full freighter services require peak-capacity in handling and trucking facilities. With scheduled ('B-747') full freighter services declining, the requirement to vacuum-up cargo in the region to fill 100+-ton departures might disappear, resulting in a shrinking catchment area;
- If this trend will not be compensated by an increased use of belly capacity at the mainports, development of cargo warehouses might hamper or even will lead towards an overcapacity. As a consequence, expected future revenues for mainports out of cargo related real estate development could stagnate;
- At the other hand, if mid-sized airports will continue to grow, for them revenues out of cargo real estate development could increase, as will employment in its region resulting in economic growth and a growing catchment area;
- Prerequisite for successful cargo growth will be timely availability of up to standard handling quality, increased cargo security and modern warehouse facilities;
- With the outrageous and on-going fleet expansion of the MEB3 carriers, to our opinion, there are ample opportunities for cargo at the mid-sized European airports.



## Top 10 European airports and our reference group

Top 10 European airports (cargo)	
1	Frankfurt
2	Paris
3	Amsterdam
4	London
5	<i>Leipzig-Halle</i>
6	Cologne
7	Luxembourg
8	Liege
9	Brussels
10	Milan

Mid-sized European Airports	
1	Copenhagen
2	München
3	Vienna
4	Stockholm
5	Düsseldorf
6	Prague
7	Warsaw
8	Lyon
9	Hamburg

## Questionnaire

1. Has your intercontinental passenger network shown an increase in belly cargo capacity during the period 2011-2013?
2. Can you indicate which (new) carriers increased their belly capacity at your airport (f.i. through use of Boeing 777/787 or Airbus A- 330/340 aircraft), on which routes and using which equipment? Please include confirmed new routes for 2014.
3. Did you record an increase of international cargo volumes via/at your airport? Which part of this growth can be attributed to belly freight versus all cargo freight?
4. If growth did occur, can you elaborate as to (e.g. in your opinion, shown in your figures, local information) indicate whether this has effected volumes of other – competing – European airports?
5. Has your airport seen an increase of international freight forwarder activities such as an increase (in the use of) of office/warehouse space, new entrants or other signs?
6. In your opinion, have any of above signals or trends lead to an decrease/increase of air cargo trucking to and from the competing European air cargo airports or do you expect a change in volumes or frequency of such trucking operations?
7. Did you record an increase in local delivered air cargo or has the increased international (passenger) network lead to an increased awareness/appreciation by the local shippers/forwarders?

# Stratagem Consulting Product portfolio

At Stratagem Consulting - besides our core competences of Aviation and Air Cargo Logistics - we have established strategic partnerships with senior experts in the fields of airport development, master planning, airport engineering and commercial airport real estate development. Together we present ourselves as Stratagem Airport Development Group, which gives us a wide-ranging portfolio to serve airports, airlines, logistic service suppliers, governments and (regional) real estate development agencies. Below you can find an overview of our four areas of expertise:

<p><i>Airport Strategy, Marketing and Business Development</i></p> <p><i>Market Research</i></p> <p><i>Program Management</i></p> <p><i>Management, Organization &amp; Implementation</i></p>
<p><i>Airport Master Planning &amp; Studies (including Design &amp; Engineering)</i></p> <p><i>Facility Sizing of Airport Operational Buildings</i></p> <p><i>Terminal Area Development Planning</i></p>
<p><i>Urban Planning &amp; Landscape Design</i></p> <p><i>LCC Terminal &amp; Operational Buildings (including Design &amp; Engineering)</i></p>
<p><i>Airport Real Estate Development</i></p> <p><i>Airport City Concepts</i></p> <p><i>Real Estate Finance</i></p>

Through these partnerships we have the ability to expand or reduce our team to make an exact fit to meet the customers' specific requirements and at competitive costs.

## Stratagem Consulting Project References

Over the years we have built up a list of international customers answering to a variety of requirements in the field of aviation related projects. Please find below a selection of the airports and aviation projects to which we have contributed our services:

<p><b>EUROPE:</b></p> <ul style="list-style-type: none"> <li>▪ Düsseldorf International Airport (Germany)</li> <li>▪ Frankfurt Hahn Airport (Germany)</li> <li>▪ Brussels International Airport (Belgium)</li> <li>▪ Liege Airport (Belgium)</li> <li>▪ Amsterdam Airport Schiphol (The Netherlands)</li> <li>▪ Twente Airport (The Netherlands)</li> <li>▪ Lelystad Airport (The Netherlands)</li> <li>▪ Maastricht Aachen Airport (The Netherlands)</li> <li>▪ Milan Malpensa (Italy)</li> <li>▪ Paris-Vatry Airport (France)</li> <li>▪ Zagreb International Airport (Croatia)</li> <li>▪ Sofia International Airport (Bulgaria)</li> <li>▪ Sarajevo International Airport (Bosnia &amp; Herzegovina)</li> <li>▪ Chisinau International Airport (Moldova)</li> <li>▪ St. Petersburg Pulkovo Airport (Russia)</li> </ul>	<p><b>INTERCONTINENTAL:</b></p> <ul style="list-style-type: none"> <li>▪ Kuala Lumpur International Airport (Malaysia)</li> <li>▪ Cairo International Airport (Egypt)</li> <li>▪ Seoul Incheon Airport (South Korea)</li> <li>▪ Teheran International Airport (Iran)</li> <li>▪ Jeddah International Airport (Saudi Arabia)</li> <li>▪ Seeb International Airport (Oman)</li> <li>▪ Amman International Airport (Jordan)</li> <li>▪ Taipei International Airport (Taiwan)</li> <li>▪ Cartagena International Airport (Colombia)</li> <li>▪ St-Maarten International Airport (Dutch Antilles)</li> <li>▪ Campinas International Airport (Brazil)</li> <li>▪ Cape Town International Airport (South Africa)</li> <li>▪ New Delhi International Airport (India)</li> <li>▪ Hyderabad International Airport (India)</li> <li>▪ Mumbai International Airport (India)</li> <li>▪ Yerevan Airport (Armenia)</li> </ul>
<p><b>OTHER ASSIGNMENTS:</b></p> <ul style="list-style-type: none"> <li>▪ Dutch Ministry of Transport (European Air Cargo Benchmark, multiple aviation studies) Dutch Ministry of Transport (criteria for air route development of Amsterdam Airport Schiphol)</li> <li>▪ Dutch Ministry of Economic Affairs (evaluation of the Dutch Aerospace Industry)</li> <li>▪ Schiphol Group (design and implementation SRA-CP Cargo Area)</li> <li>▪ Schiphol Area Development Company (Business Case HST Cargo, Market Research HST Cargo, Market Research and functional design Trucking Park facilities, Market Research Logistic Area A4 Zone West)</li> <li>▪ Port of Amsterdam (Secured Port)</li> <li>▪ ACSA, South Africa (air cargo master plan for all ACSA airports - related to privatisation)</li> <li>▪ Hong Kong Tradeport, China (cargo marketing plan)</li> <li>▪ Brisbane Airport Corporation, Australia (cargo development and marketing plan)</li> <li>▪ State of Sonora, Mexico (study on possibilities of air cargo development at Obregon Airport)</li> <li>▪ Stewart Airport Development Co, New York (study on air cargo development possibilities)</li> <li>▪ Aviapartner (optimization air cargo processes at BRUCargo)</li> <li>▪ WFS (optimization of air cargo processes at Amsterdam Airport Schiphol)</li> </ul>	