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AIRPORTS COUNCIL INTERNATIONAL

AIRPORT INDUSTRY CONNECTIVITY REPORT 2016

AIRPORTS COUNCIL INTERNATIONAL

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INTRODUCTION

For the third time ACI EUROPE is publishing an annual update on the state of European air connectivity.

Today, the issue of air connectivity is more important than ever for Europe. With a persistently sluggish economy and the global centre of economic gravity continuing to shift eastwards, it is essential that European businesses and citizens are readily able to connect with and tap into new sources of growth. In parallel, the deepening and streamlining of the EU internal market also offers more opportunities for growth, and the ability to accessibly travel within this single market remains crucial.

Indeed, the European Commission has specifically recognised the importance of air connectivity in its recent *Aviation Strategy*, pointing to aviation as being *'a strong driver of economic growth, jobs, trade and mobility for the European Union*[1]. The Aviation Strategy specifically refers to the findings of previous ACI EUROPE Airport Connectivity reports in its accompanying 'Staff Working Document'.

While the central importance of air connectivity is now widely understood, the actual concept of connectivity is inherently vague – and often meaning different things to different people. It is therefore essential that a clear definition is applied to quantify connectivity, and that this methodology is employed consistently to track changes in connectivity across time and space.

The *'ACI EUROPE Airport Industry Connectivity Report 2016'* does just that. Analysing connectivity data from the SEO Economic Research's 'Netscan' connectivity model, the report provides in-depth insights into how well Europe is connected by air, both internally and with other regions in the world. It distinguishes between direct and indirect connectivity, and also takes a special in-depth look at the dynamics at Europe's hubs – which act as engines of connectivity for wider outreach. The report also makes clear how Europe's air connectivity has evolved – not only since last year, but also since the financial and economic crisis of 2008.

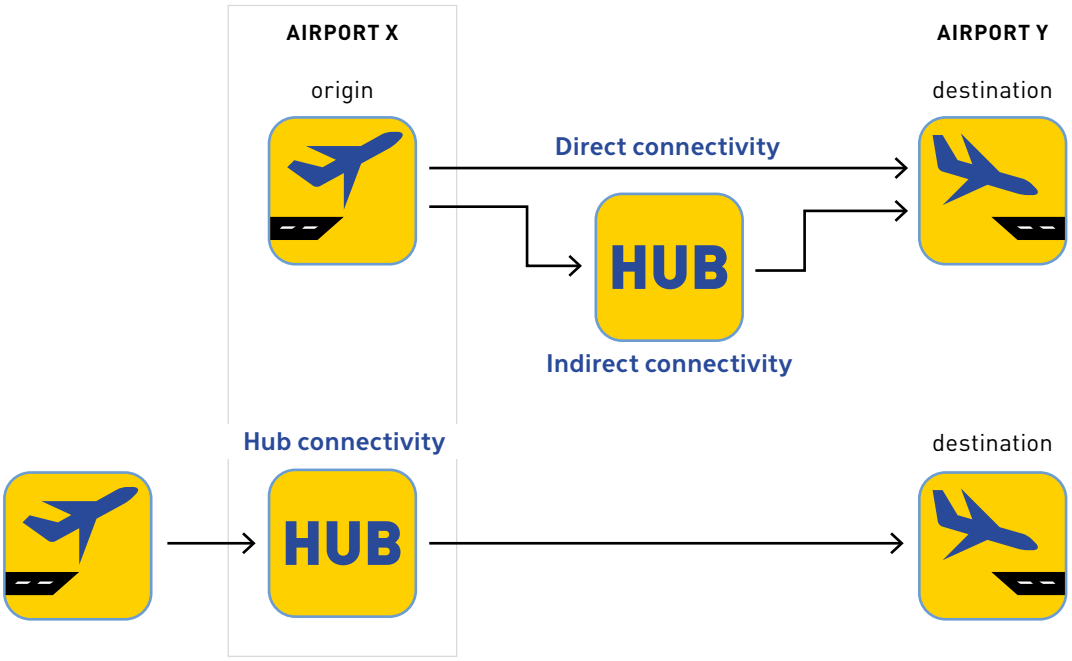
The 2016 report thus provides an overview of key air connectivity trends in the following fields:

- **'European Connectivity at a Glance'** – key developments in terms of Europe's direct and indirect connectivity, as well as its connectivity with world regions;
- **'EU & Non-EU Markets'** – a more detailed view of the connectivity trends and connections with world regions in the differing markets of the EU and non-EU bloc of countries;
- **'Airport Groups'** – how connectivity is developing in the different segments of the airport industry;
- **'Hub Connectivity'** – a focus on Europe's position as an enabler of wider airport connections, with a comparative analysis of other global hubs providing an insight into Europe's relative position in terms of global hub connectivity;
- **'A Focus on the Hubs'** – a special in-depth analysis of the relative strengths and recent developments of those individual large airports in Europe which act as engines of connectivity for the wider continent;
- **Country and airport-specific data** are available in Appendices F, G & H.

The methodology underlying the SEO Netscan Model is outlined in Appendix I.

[1] *'An Aviation Strategy for Europe'*, European Commission, December 2015, page 2.

CONNECTIVITY DEFINITIONS



- **Direct Connectivity**: the total number of direct scheduled flights offered by airport X to all other airports.
- **Indirect Connectivity**: the total number of indirect connections offered by airport X to other destinations via an intermediate airport, with each indirect connection given a score of between 0 and 1 to reflect the quality of the connection. Quality is defined by how fast the connection is relative to an equivalent direct connection (which is a function of transfer time at airport, as well as the speed of the aircraft operated and any increase in the distance travelled).
- **Overall Airport Connectivity**: the sum of direct connectivity and indirect connectivity.
- **Hub connectivity**: the total number of connections offered through hub airport X, excluding self-connections. Connections can be purchased as 1 package by the passenger from airlines (i.e. connection is via same airline or airline alliance). As with indirect connectivity, each connection scores between 0 and 1 depending on its quality, with quality reflecting how fast the connection is relative to an equivalent direct connection (which is a function of transfer time at airport, as well as the speed of the aircraft operated and any increase in the distance travelled).

KEY FINDINGS

- While 2016 was a **good year for direct connectivity** in Europe (**+4.5%**), changing aviation market dynamics (in particular the continued rise of LCCs and relative retrenchment of legacy carriers) resulted in **indirect connectivity remaining flat** (**+0.4%**). This is unprecedented as direct connectivity growth usually yields even larger indirect connectivity gains – and could have implications for Europe's longer-term air connectivity. Due to weaker indirect connectivity, **overall airport connectivity increased by only +1.7%**.

- Similarly to last year, **EU countries outperformed the non-EU bloc** in 2016 in terms overall airport connectivity (+2.6% versus -1.4%). Quite significantly, the **EU finally fully recovered its pre-crisis level of direct connectivity**, which now stands at +1.3% compared to 2008 – on the back of +5.1% growth in 2016. Indirect connectivity sharply decreased in the non-EU block (-3.8%) and grew by only +1.4% in the EU.

- The **Middle East** continued to register the strongest growth in direct connectivity out of **Europe** (+8.8%), followed by **Latin America** (+5.9%) and the core intra-European market (+4.9%) and **North America** (+4.2%). Direct connectivity also grew to **Asia Pacific** (+3.8%) but decreased sharply to **Africa** (-11.8%).

- The picture is slightly different out of the EU, with the intra-European market and Latin America experiencing the largest growth (+5.7% and +5.5% respectively), followed by the Middle East (+4.6%) and North America (+2.9%). Direct connectivity to Asia Pacific was almost flat (+0.6%) while Africa also decreased sharply out of the EU (-12.6%).

- **Large airports & hubs** (above 25 million passengers per annum) did not see their overall connectivity growing in 2016 (**-0.2%**) while **smaller ones** grew their overall connectivity between **+2.8%** and **+3.2%**. This is also a reversal compared to previous years – again reflecting changed aviation market dynamics.

- Reflecting the weak performance of indirect connectivity, **Europe's hub connectivity grew by just +1%** in 2016 – well below recent and historical trends. Hub connectivity at the largest airports declined slightly (-0.3%) – these airports account for more than 80% of Europe's overall hub connectivity.

- Europe's largest hubs remain global leaders in terms of hub connectivity. While developments in the Middle East mean that Gulf hubs now have the strongest global levels of intercontinental connectivity (between markets other than their home market), **Europe's largest hubs have the highest levels of overall hub connectivity** compared to their international peers. When comparing the top 3 hubs in Europe, North America, Asia Pacific and the Middle East, it is the European ones which have both the best and most diversified hub connectivity of the world. **Frankfurt airport** has the best hub connectivity not just in Europe but worldwide.

- **European hubs** have had varying fortunes in recent years as a result of local circumstances and increasing competition. While it used to be essentially about primary and secondary hubs, the 'hub market' has now become **more fragmented** and **competitive** – leading to the emergence of 'sub-groups' of hubs. Airports within each sub-group are reacting in different ways to the ongoing transition in the airline industry, and each sub-group has its own distinct connectivity challenges and opportunities.

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1 EUROPEAN AIRPORT CONNECTIVITY AT A GLANCE

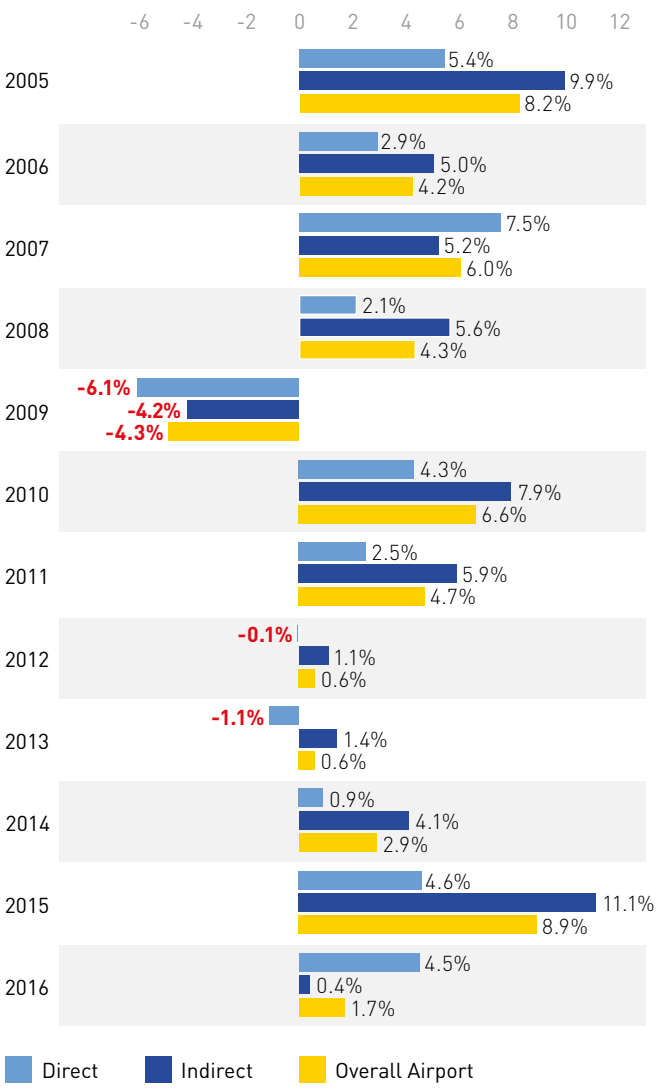
- 2016 has been a year of strong growth for direct connectivity. However, for the first time such growth has not translated into indirect connectivity growth – thus limiting overall airport connectivity gains. This largely reflects a changing market – in particular the continued rise of LCCs and relative retrenchment of the legacy carriers, significant connectivity gains at secondary airports rather than at larger & hub airports, and specific cases of de-hubbing.

In 2016 overall **airport connectivity** in Europe (direct + indirect connectivity) increased by **+1.7%**. This is a moderate increase, following the +8.9% improvement in 2015. Last year's strong growth reflected a 'catch-up effect' in airport connectivity, as airlines put significantly more capacity onto the market for the first time since the 2008/2009 global financial crisis – thus catering for an underlying demand for air transport which had been steadily growing in the previous years. Unlike this year, 2015 also saw this additional capacity translate into more indirect connection possibilities.

However, despite slower growth in overall airport connectivity, Europe's **direct connectivity** continued to improve at the same pace as last year, growing by **+4.5%**. These two years of consecutive strong growth came after a sustained period of stagnation from 2011 onwards, when direct connectivity failed to fully recover its 2008 levels. Indeed, Europe's post-crisis recovery in direct connectivity has only been delivered in the last 2 years.

The weak performance of overall airport connectivity compared to 2015 was thus a consequence of practically non-existent growth in **indirect connectivity**, which only increased by **+0.4%**. These diverging results suggest that the historical relationship between direct and indirect connectivity growth may be weakening – with ongoing changes in the airline industry the most likely driver of this change.

1 % Changes in European direct, indirect & overall airport connectivity (2005-2016)



Healthy growth in direct connectivity

Direct connectivity improvements came with airlines adding more capacity in the market on the back of generally improving trading conditions – including sustained demand levels and lower oil prices. However, airline capacity growth generally remains cautious. It also tends to focus on growing existing markets rather than creating new ones, which results in a trend of traffic concentration.

This means that **direct connectivity tends to grow more in depth than in breadth**. Passenger numbers are growing faster than the number of aircraft movements – a clear indicator that new routes and frequencies are being added very carefully. This disciplined approach delivers higher passenger loads, and is more profitable for the airline industry. It therefore represents more financially sustainable growth. But as a consequence direct connectivity does not increase as fast as it should.

This dynamic is reflected in the **continued disconnect between direct connectivity and passenger numbers** in the post global financial crisis environment – since 2011 passenger volumes have increased at a significantly higher pace of growth than direct connectivity growth, which stagnated until 2015 and then increased only moderately.

The ongoing recovery in direct connectivity over the last two years was not equally spread across all airports, again pointing to a certain degree of **concentration**. In 2016 direct connectivity increased at 60% of European airports. In 2016 more than a third of airports (39%) still had lower direct connectivity levels comparison with 2008 (when connectivity was highest before the crisis). In terms of overall airport connectivity, one airport in four (26%) was still below 2008 levels (See Appendix C).

Market dynamics mean that greater direct connectivity no longer automatically leads to greater indirect connectivity

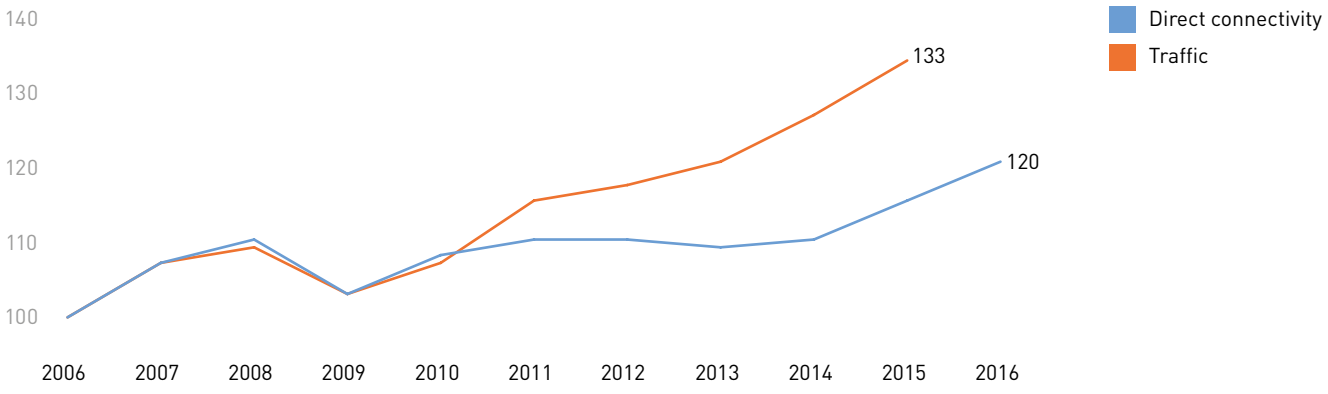
In previous years, direct connectivity growth was strongly and positively associated with indirect connectivity growth. More direct connections between airports generally meant more opportunities for transfers between these flights and so indirect connectivity typically grew faster than direct connectivity.

It is remarkable that in 2016 the opposite was the case. In spite of the fact that there were +4.5% more direct connections from European airports, indirect connectivity barely increased at all, with only a +0.4% improvements on 2015 levels. Amongst those airports that did manage to increase direct connectivity, over 40% saw their indirect connectivity actually decrease at the same time.

There were several reasons for this divergence between direct and indirect connectivity:

➔ **The continued rise of the Low Cost Carriers (LCCs).** While the distinction between LCCs and legacy carriers continues to blur, to date the vast majority of LCC traffic still remains point-to-point. This means that it is not possible to transfer from or to a point-to-point flight[2]. As a result, while additional LCC flights increase direct connectivity, they have no or only

2 Direct connectivity and passenger traffic (2006-2016, 100 = 2006)



[2] 'Self-connections' are possible, whereby passengers buy 2 separate flights via 2 separate transactions. In some cases a 3rd party such as the airport facilitates this process (providing 2 flights via 1 transaction, protecting against risk of missing connecting flight, etc.). Data on self-connecting passengers is difficult to source, and is not within the scope of this Report. However indications are that to date these make up a very small proportion of the market.

marginal impacts upon indirect connectivity. With the sector continuing to evolve, and at least one prominent LCC seeking to provide transfers to other airlines, this situation may change in the future.

➔ **Legacy carriers & alliance retrenchment.**
Most of Europe's indirect connectivity is delivered by the hub & spoke models of the legacy carriers – with large hub airports delivering significant indirect connectivity for a much wider range of smaller airports. This means that indirect connectivity across Europe is hit disproportionately when the legacy carriers retrench at their hubs. Removing one connection at a given hub leads to a loss of several connection possibilities for onward travel via that hub. In 2016 Star Alliance and Sky Team both reduced significantly their number of connections delivered at Frankfurt & Munich and Paris Charles de Gaulle airports respectively.

➔ **Direct connectivity growth at secondary airports.**
Much of the growth in direct connectivity is occurring at Group 2 & Group 3 airports (see Section 3). An increase in the number of flights at these airports has only limited impact on indirect connectivity at other airports, as there are less transfer possibilities compared to larger (Group 1) airports.

➔ **Specific cases of de-hubbing.**
The de-hubbing at Palma de Mallorca by Air Berlin and the collapse of Transaero Airlines at Moscow-Vnukovo Airport hit Europe's air connectivity not only at these airports, but also at typically-smaller airports that relied upon these hubs to facilitate indirect connections.

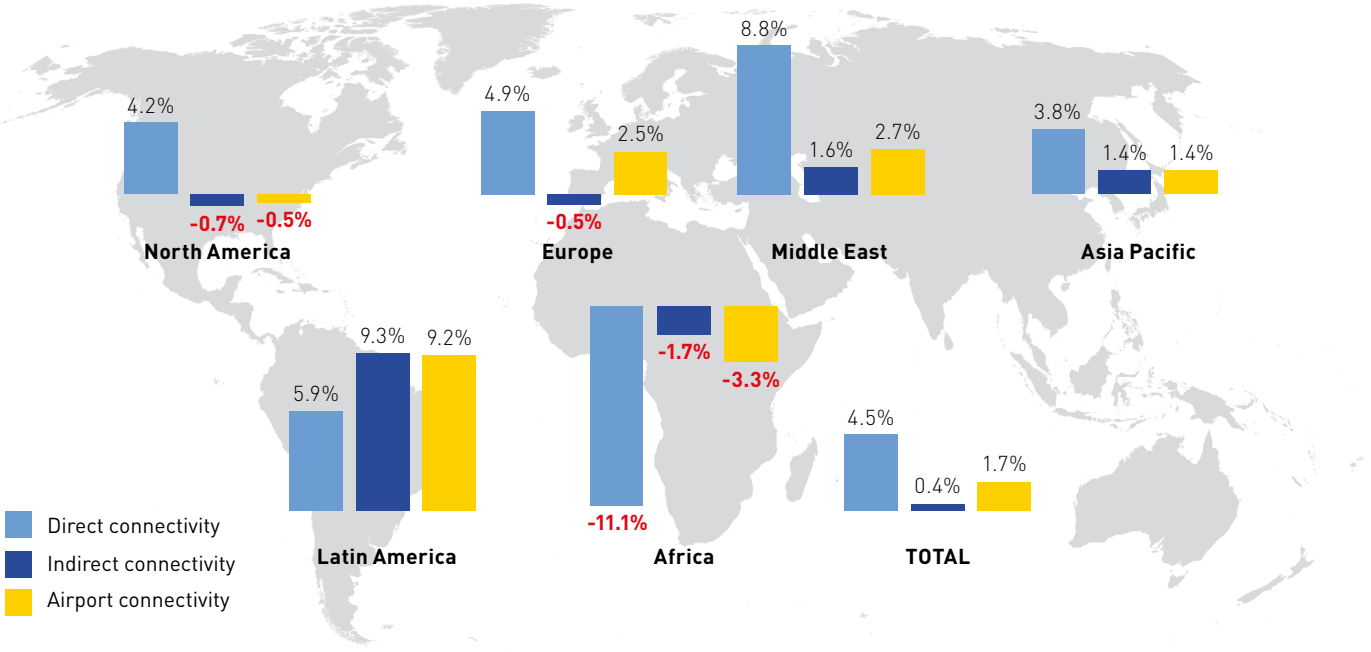
➔ **Developments outside of Europe.**
By its very nature European connectivity can be hit by industry changes in the wider world. For example, the large scale reorganisation of Malaysian Airlines at Kuala Lumpur Airport and the subsequent ending of the Lufthansa code-sharing arrangement both undermined Europe's indirect connectivity to Asia Pacific. Similarly, developments at New York-Newark and Atlanta airports hit Europe's indirect connectivity to North America.

➔ **Decline in the quality of indirect connectivity.**
Indirect connectivity scores are a consequence not only of the range of transfer possibilities, but also of their quality (waiting time at the connecting airport,

Table 1 Direct, indirect & airport connectivity (2016 vs. 2015, 2008 & 2006)

	2016 vs. 2015	2016 vs. 2008	2016 vs. 2006
Direct connectivity	4.5%	8.9%	19.4%
Indirect connectivity	0.4%	27.5%	41.7%
Airport connectivity	1.7%	20.7%	33.4%

3 Direct, indirect and total airport connectivity by world region (2016 vs. 2015)



reroute factor, additional distance flown compared with direct connections). The same absolute number of flights can lead to different levels of indirect connectivity, depending on how these flights are scheduled. If flights are scheduled too far apart, then transfers between these flights may be extremely unlikely in practice, and therefore these theoretically possible connecting opportunities will not contribute towards indirect connectivity scores of other airports. Airports that are highly congested at peak hours will find it more challenging to significantly boost their indirect connectivity – as there is limited or no room to accommodate additional flights at a time in the day when the airport offers the widest range of connection opportunities.

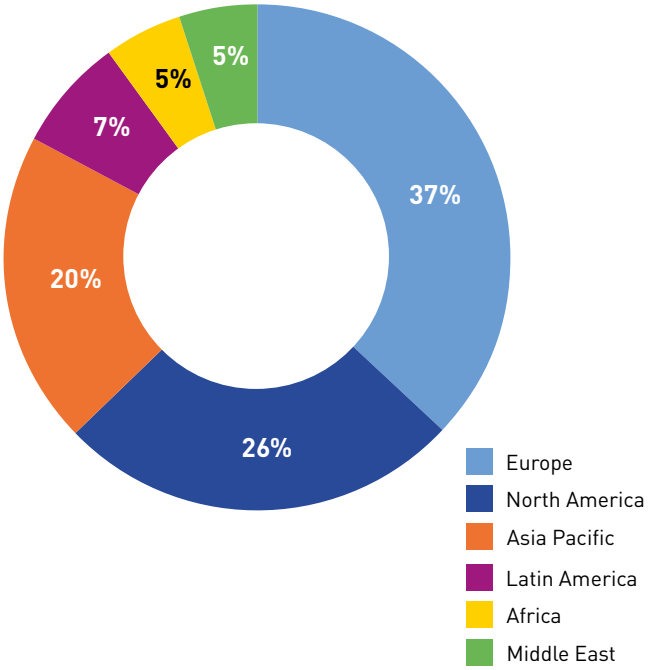
For the most part, the above factors are generally **ongoing trends**, rather than once-off events. Looking forward it will be interesting to see whether the changed dynamic in the relationship between direct and indirect connectivity, as observed in 2016, will continue in the years ahead. The potential consequences are significant. While direct connectivity is of more value, indirect connectivity allows passengers to reach parts of the world that would otherwise be inaccessible. Indirect connections can also establish traffic flows that allow direct connections in the future. Less potential indirect connectivity would therefore represent a real loss for Europe.

Strong direct growth to key markets undermined by weaker indirect growth

Direct connectivity to the core markets of **Europe** and **North America** registered strong growth of +4.9% and +4.2% respectively in 2016. Yet at the same time indirect connectivity to Europe declined by -0.6% and indirect connectivity to North America by -0.7%. Total airport connectivity to North America was in fact negative, at -0.5% (See Appendix B, Table 3).

The **Middle East** again recorded strong direct connectivity growth of +8.8%, driven by the continued rise of the region as an aviation superpower – despite an increasingly challenging geopolitical environment. Indirect growth to the region was much weaker at +1.6% – in part reflecting the fact that new services by the

4 European airport connectivity shares by world region (2016)



3 large Gulf carriers in 2016 were mostly at secondary European airports, where less transfers tend to occur.

Europe's connectivity to **Asia Pacific** improved at a healthy and consistent rate in 2016. Growth of +3.8% in direct connectivity is stronger than last year and in line with year-on-year growth post-crisis. Weak indirect connectivity growth of just +1.4% was particularly surprising – in light of the strong direct growth to the Middle East, which typically feeds indirect connections to Asia Pacific.

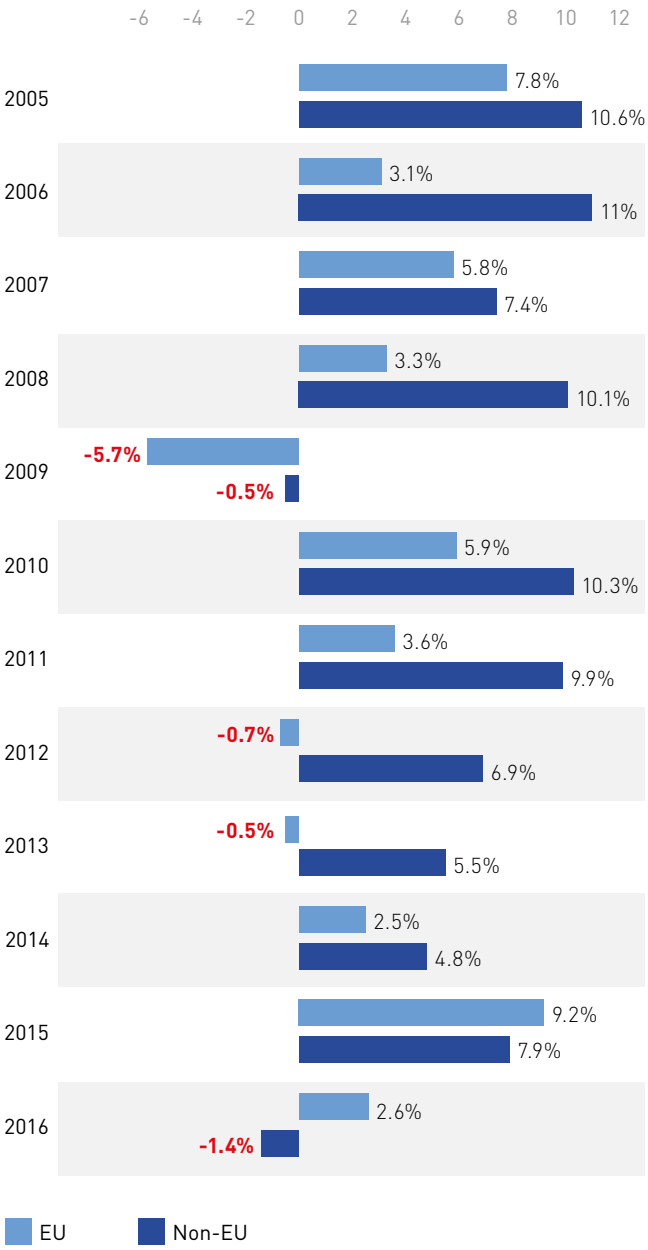
Reflecting tensions in **North Africa**, and a downturn in the wider African economy associated with the weakening of a resource boom, direct connectivity to Africa shrunk sharply by -11.8%. Indirect connectivity was also reduced, by -1.7%.

Connectivity with **Latin America** increased by an impressive +5.9%, with an associated +9.3% increase in indirect connectivity, in spite of the economic woes of the region. However it must be remembered that Europe's absolute level of connectivity with Latin America remains very small – this increase in direct connectivity equates to just an additional circa 56 flights in a week from European airports to Latin American airports during the Summer season.

2 EU & NON-EU MARKETS

- For the second year in a row overall airport connectivity in the EU outperformed that of the non-EU bloc, going against recent historical trends. However, the difference in performance was primarily related to indirect connectivity with direct connectivity remaining strong in both markets. A deeper look also suggests that the non-EU bloc is stronger than first appears.

5 Airport connectivity in EU & Non-EU (2005-2016)

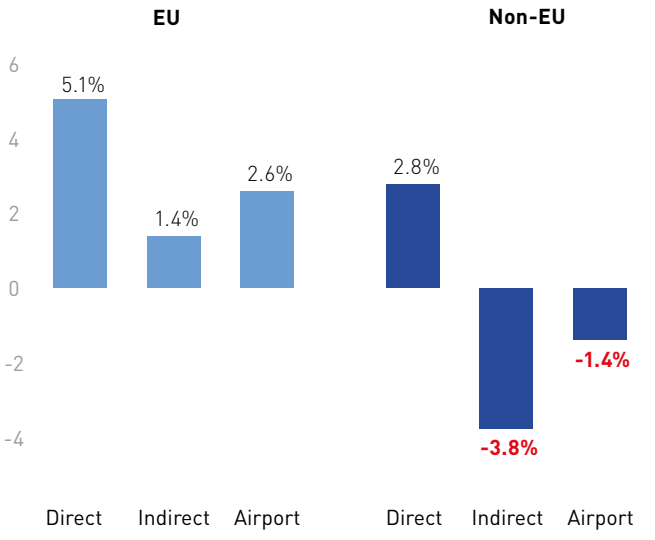


In 2016, the EU has finally recovered its pre-crisis direct connectivity, but indirect connectivity suffers

2016 was another good year for EU airport connectivity, with **direct connectivity** again recording **healthy growth**. A **+5.1%** direct connectivity increase outperformed equivalent growth in 2015 and stands in sharp contrast to the average annual change post-crisis, which was -0.1% between 2009 and 2014.

This growth was also enough to finally restore the **EU's direct connectivity to pre-crisis levels** – 8 years later – with +1.3% more direct flights from EU airports in 2016 than in 2008. For the first time EU direct connectivity to wider Europe and Latin America also surpassed 2008 levels, with direct connectivity to North America remaining just -0.4% behind the pre-crisis peak.

6 Direct, indirect & airport connectivity (2016 vs. 2015)



However, almost **half of EU airports (48%) still had direct connectivity levels below that of 2008**, suggesting that the recovery remains concentrated, and not experienced by all. This was down from an equivalent figure of 57% of all EU airports in 2015 (See Appendix C).

However, as with Europe as a whole **EU indirect connectivity** lagged behind. In 2016 the EU experienced only a **+1.4%** increase in indirect connectivity, which contributed to limited growth in **overall airport connectivity** of just **+2.6%** in 2016.

Non-EU bloc recording growth in direct connectivity, but overall connectivity growth undermined by indirect connectivity

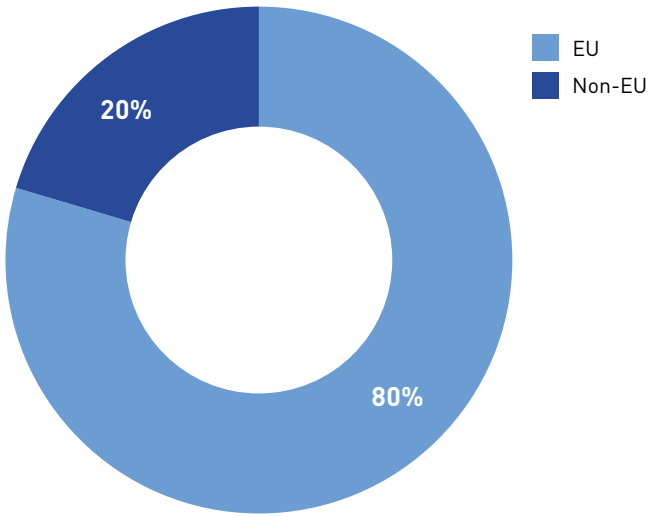
The non-EU bloc recorded growth in **direct connectivity** of **+2.8%** in 2016, but this was accompanied by an actual decrease in **indirect connectivity** of **-3.8%**.

Across almost all global regions except Europe, the non-EU bloc recorded stronger direct connectivity growth compared to the EU. However, at the same time, non-EU indirect connectivity to all but one world region decreased on 2015 levels – while in contrast the EU blocs' indirect connectivity to most regions increased (for more details see Appendix C).

Furthermore, despite having positive growth in direct connectivity in the crucial European market (+2.1% for non-EU versus +5.7% for EU) the non-EU bloc actually recorded a large decline in indirect European connectivity (-5.6%) compared to the EU's increase of +1.1%.

In addition to the impact of the recession in Russia and the bankruptcy of Transaero, the factors outlined in Section 1 (which explain the difference between direct & indirect growth), are also at play in the non-EU bloc. In particular, these countries have not benefited from the connectivity levels associated with historical legacy carrier growth. This means that a greater proportion of their connectivity has been delivered more recently, and naturally this has primarily come from point-to-point LCCs rather than hub & spoke legacy carriers.

7 EU & non-EU market share in total airport connectivity (2016)



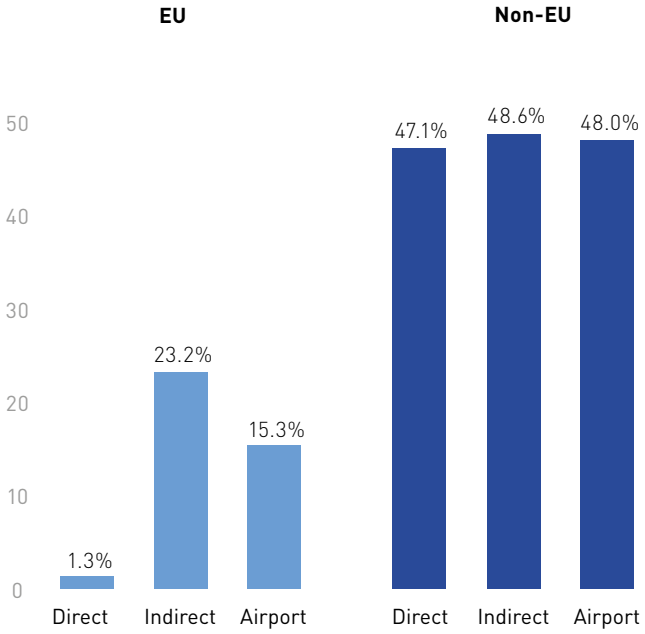
However, there is another dynamic at play. **Non-EU hub connectivity** increased by **+3%** in 2016, while in the **EU**, **hub connectivity** was basically stagnant, at **+0.5%**. While this at first seems counterintuitive, it may well reflect the fact that the non-EU bloc depends upon EU airports to deliver their indirect connectivity, and it is in fact the slower growth within the EU which is contributing towards a decline in non-EU indirect connectivity. Hub connectivity – which looks at what is going on within individual airports rather than the wider network – suggests that the non-EU bloc has in 2016 actually improved its ability to channel passengers from one destination to another.

History strongly favours the non-EU bloc

Over the past decade, the non-EU bloc has enjoyed a significantly faster growth in all forms of connectivity – direct, indirect, overall airport & hub connectivity – compared to the EU bloc. Compared to 2008, non-EU direct connectivity is 47.1% higher, while EU direct connectivity has grown by just +1.3%. Similarly non-EU overall airport connectivity is up +48% on 2008 levels, while for the EU the increase is just +15.3%.

This of course reflects **wider economic convergence**, with non-EU countries typically having lower GDP per capita, which tends to 'catch up' over the longer-term. Increased GDP growth is closely linked to air

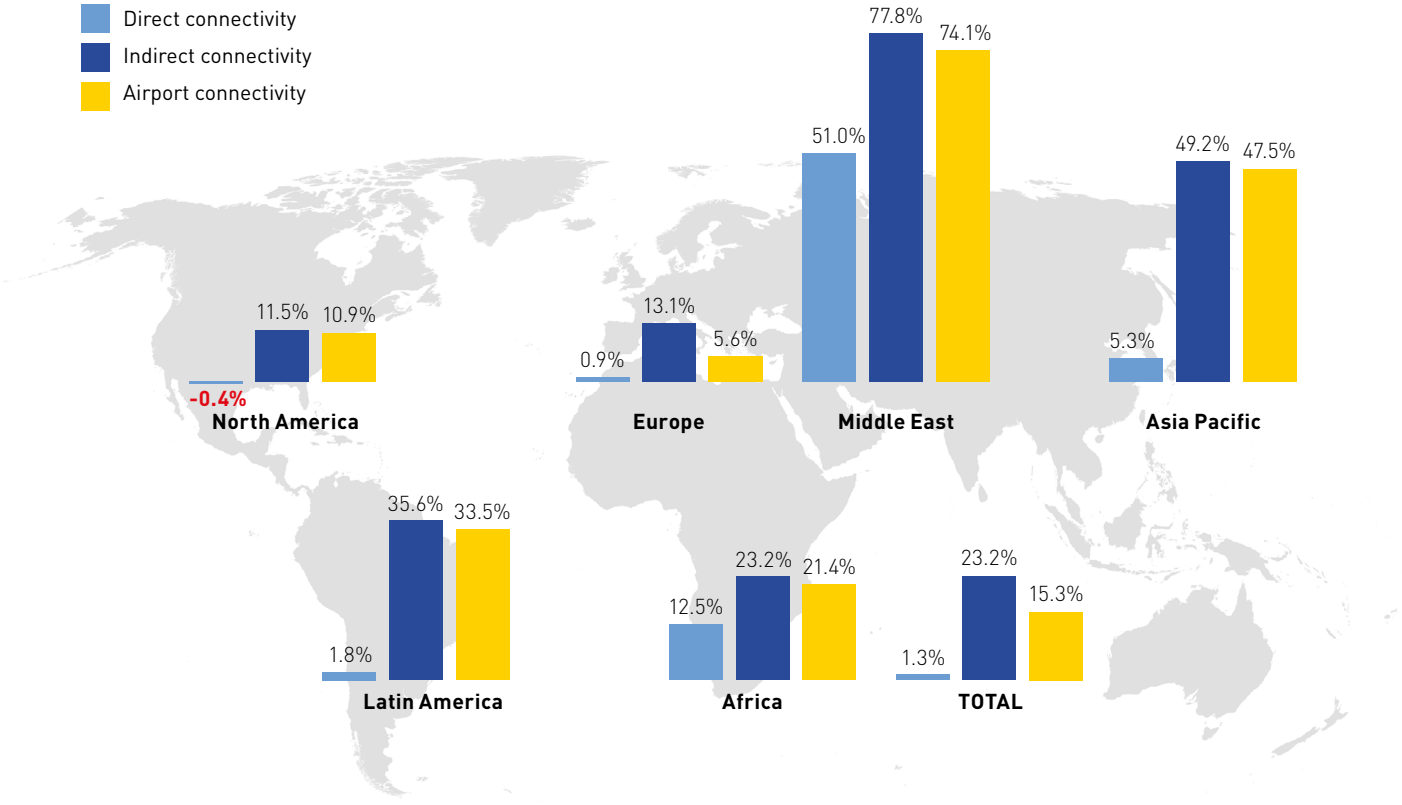
8 EU & non-EU connectivity (2016 vs. 2008)



connectivity growth. In addition, many non-EU jurisdictions have not yet enjoyed the 'connectivity dividend' associated with a liberalised aviation sector.

Specifically in 2016, geopolitical tensions, reduced oil prices and sanctions are taking their toll on the Russian economy in particular, with a knock-on effect for those countries which typically have close economic and aviation links. However notwithstanding shorter-term specific issues, the significant untapped potential of these countries mean that the longer-term trend of connectivity convergence is likely to reassert itself.

9 Direct, indirect and airport connectivity from EU airports by world rgion (2016 vs. 2008)



3 AIRPORT GROUPS

- 2016 saw diverging fortunes for the 4 different airport size groups, with connectivity developments typically reflecting dependencies upon different segments of the airline industry. Contrary to previous years, the largest airports tended to underperform compared to the industry average, with most of the connectivity growth occuring at smaller airports.

The **largest airports** – with more than 25 million passengers per annum (mppa) – experienced a small increase in direct connectivity (+1.3%), while negative indirect connectivity growth (-0.9%) meant that overall airport connectivity for these Group 1 airport slumped by **-0.2%**. These airports typically have a larger reliance upon legacy carriers than their smaller counterparts, therefore their connectivity is likely to be hit disproportionately by the continued restructuring of legacy networks.

Group 2 airports – with between 10-25 mppa – saw much stronger direct connectivity growth of **+5.7%**, accompanied by an increase in indirect connectivity of +1.5% which led to an overall airport connectivity

10 Airport connectivity market share by airport group (2016)

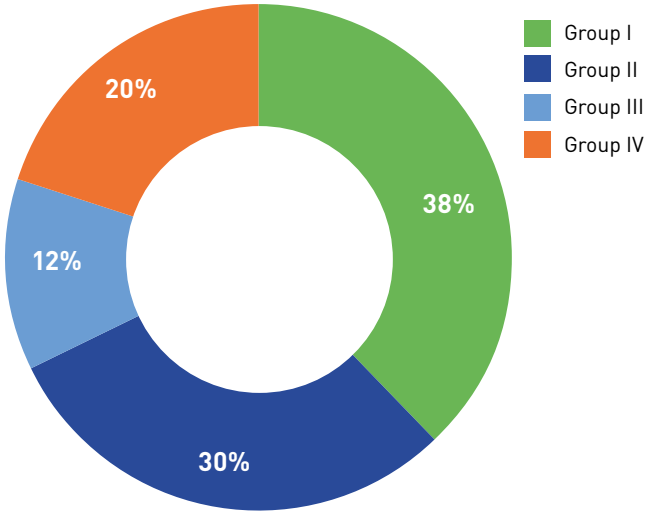


Table 2 Direct, indirect & airport connectivity by airport group

Direct connectivity	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008	YoY 2005-2008	YoY 2009-2014
Group I	1.3%	5.4%	11.2%	3.5%	2.0%
Group II	5.7%	2.9%	6.4%	3.3%	1.0%
Group III	7.4%	4.3%	14.9%	5.1%	1.3%
Group IV	6.6%	4.2%	7.9%	5.5%	0.9%
TOTAL	4.5%	4.6%	8.9%	4.1%	1.4%

Indirect connectivity	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008	YoY 2005-2008	YoY 2009-2014
Group I	-0.9%	11.1%	28.0%	4.4%	4.4%
Group II	1.5%	10.1%	24.6%	5.5%	3.2%
Group III	1.1%	12.1%	28.7%	4.9%	3.8%
Group IV	1.2%	12.3%	31.7%	6.9%	5.0%
TOTAL	0.4%	11.1%	27.7%	5.2%	4.1%

Airport connectivity	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008	YoY 2005-2008	YoY 2009-2014
Group I	-0.2%	9.2%	22.2%	4.1%	3.6%
Group II	2.8%	7.7%	18.1%	4.7%	2.5%
Group III	3.2%	9.4%	23.6%	5.0%	2.9%
Group IV	2.8%	9.3%	22.1%	6.3%	3.4%
TOTAL	1.7%	8.9%	21.1%	4.8%	3.1%

increase of 2.8% over 2015 levels. Group 2 airports, particularly in the last two years, are increasingly seeing LCCs starting and expanding operations. This allows healthier direct connectivity growth but, based on current LCC behaviour, does not translate into better indirect connectivity.

Group 3 airports, with between 5-10 mppa, recorded the strongest growth of all, with direct connectivity increasing by +7.4% and slight indirect connectivity improvement (+1.1%) leading to an overall increase of **+3.2%** in overall airport connectivity. Again, much of this growth was driven by dynamism in the LCC sector. However, growth in total airport connectivity among airports in the group was more concentrated than in the case of bigger airports. Within Group 3 airports, 1 in 5 airports have still not yet recovered their 2008 levels of overall airport connectivity.

Group 4 airports, which have less than 5 mppa, recorded dynamic direct connectivity growth of +6.6% in 2016. Much like their larger counterparts, weaker indirect connectivity growth (+1.2%) reduced overall airport connectivity growth (**+2.8%**). In this group growth of airport connectivity was even **more concentrated** than Group 3, with nearly a third of airports still having lower overall airport connectivity compared to 2008.

11 Direct connectivity by airport group (2005–2008 & 2009-2016)

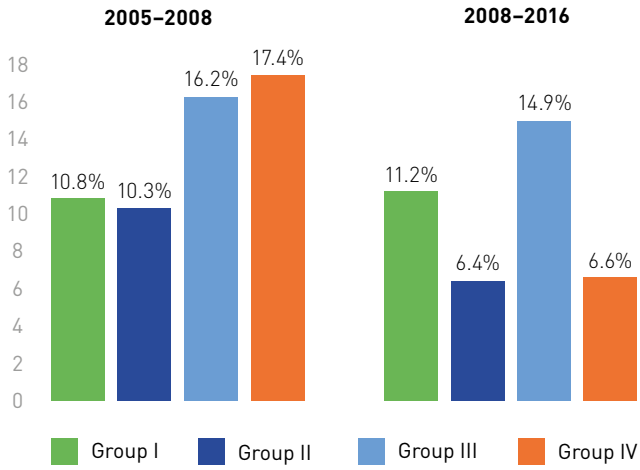


Table 3 Airports with 2016 overall airport connectivity below 2008 levels

Group I	5.6%
Group II	9.7%
Group III	22.6%
Group IV	29.4%
Group IV without capital airports	30.2%

4 HUB CONNECTIVITY

- 'Hub Connectivity' captures the capacity of European airports to facilitate transfers between scheduled flights via their facilities, and thus their capacity to offer indirect connection opportunities to other airports. 2016 saw weak growth in European hub connectivity, which as a result undermined wider indirect connectivity across the continent. Most markets saw declines, including intra-Europe and intercontinental hub connectivity. These results are consistent with the weaker performance of indirect connectivity and also point to changing aviation market dynamics – in particular between point-to-point services and indirect/connecting services.

2016 saw weak **hub connectivity** growth of just **+1%** in Europe, significantly down from +5.5% in 2015 and average year-on-year growth of +5.9% between 2009-2014. Hence, 2016 is clearly a **step change** compared to previous years.

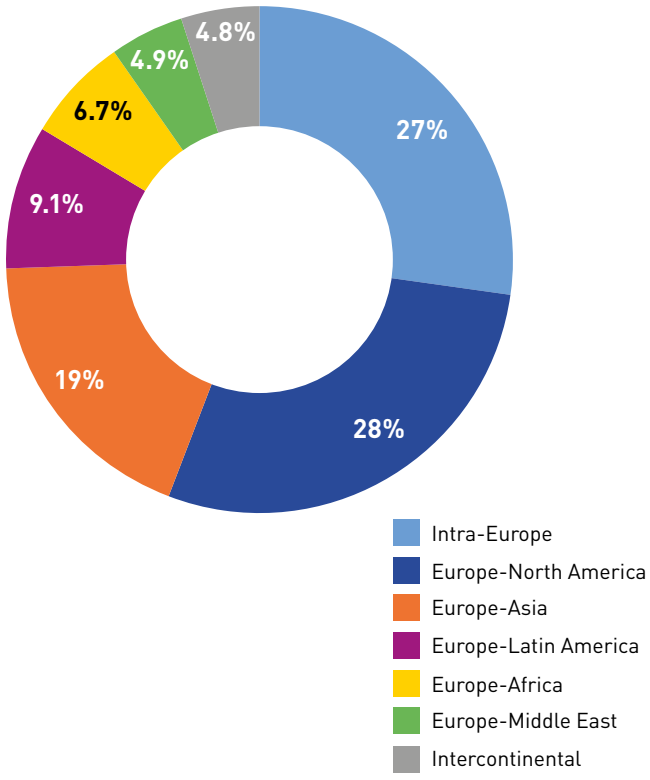
Significantly, while hub connectivity grew for all airport groups in 2016, for **Group 1 airports** (›25 million passengers per annum), it in fact shrank by **-0.3%**. These airports alone account for more than 80% of Europe's overall hub connectivity.

This decline in hub connectivity at Group 1 airports plays an important part in the loss or weak growth of indirect connectivity experienced across the wider

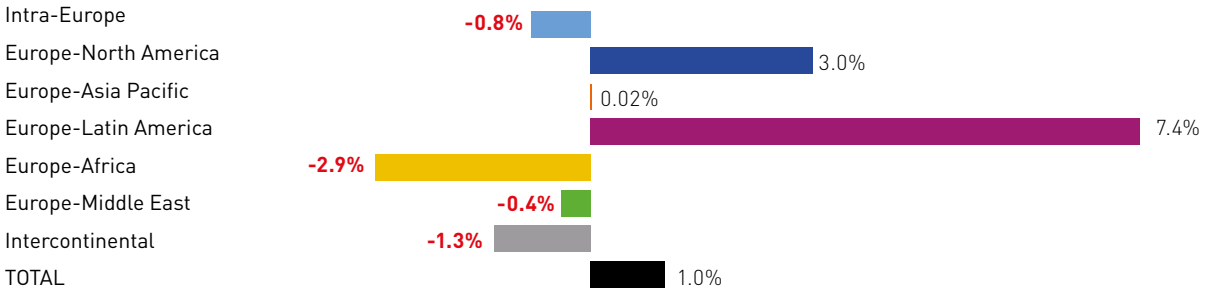
Table 4 Hub connectivity by Airport Group: 2016 Growth & Share of Market

Airport Group	% change hub connectivity YoY 2016	Share of hub connectivity
Group I	-0.3%	82.8%
Group II	6.1%	14.9%
Group III	8.1%	1.1%
Group IV	24.3%	1.2%

12 Share of hub connectivity by connecting markets (2016)



13 Hub connectivity between Europe and world regions (2016 vs. 2015)

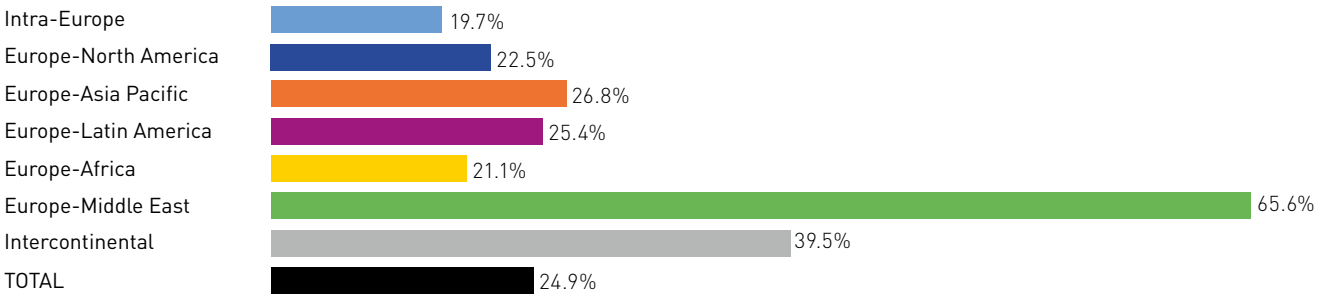


European airport network. Legacy carrier restructuring and retrenchment eroded the connection possibilities at biggest hubs, and consequentially the indirect connectivity that these provided to smaller 'feeder' airports.

In terms of world regions, hub connectivity to **Latin America** grew strongly in 2016 (**+7.4%**), but this remains a small proportion of the overall market. The only other positive development was the **+3%** increase in hub connectivity to **North America** – in line with annual growth rates since the crisis. In contrast, hub connectivity to **Africa** shrunk by **-2.9%**, reflecting wider economic slowdown and unrest in the region, and equivalent connectivity to the **Middle East** declined by **-0.4%**, possibly reflecting an increased focus on secondary European airports by the main Gulf airlines. Hub connectivity to **Asia Pacific** was stagnant, while **intra-European hub connectivity** declined by **-0.8%**, and **intercontinental hub connectivity** by **-1.3%**.

See Appendix E for data on hub connectivity specifically concerning the EU.

14 Hub connectivity between Europe and world regions (2016 vs. 2008)



5 A FOCUS ON THE HUBS

- Europe's hubs remain in a strong position. Though their global market position is no longer unique and is being increasingly challenged, their geographical location & population dynamics should help ensure that Europe keeps a strong hub position and remains well connected by air. However, European hubs are increasingly developing distinct connectivity strategies – reflecting new competitive opportunities & threats. This is notably a consequence of a more diverse airline landscape, new aircraft technology, and more liberal aviation policies.

Europe's top hub airports are vital providers of air connectivity to the world

While there has been extensive discussions in recent times at EU level about the new and growing threats to European air connectivity, it should be stressed that **EU hubs remain the best connected globally**, and that they serve the continent well as enablers of air connectivity with the wider world.

Looking at key airports within the global aviation network in terms of their 'hub connectivity' it can be seen that European airports and in particular EU airports dominate the upper reaches of the rankings. Out of the top 10 listed global airports in terms of hub connectivity, 6 are in Europe and 5 are in the EU. The cumulative level of hub connectivity of the top 3 European hubs (Frankfurt, Amsterdam Schiphol & Paris Charles de Gaulle) is significantly higher than the equivalent score for the top 3 hubs in North America, the Middle East, or Asia.

This in part reflects Europe's position as a densely-populated and economically advanced world region, but it also reflects the underlying strengths of the European integrated and liberalised aviation market.

Typically, hub airports deliver most connectivity to their own regions. Interestingly Europe is an exception in this respect. **The top 3 European hubs deliver more hub connectivity to North America and Asia Pacific than intra-European hub connectivity**. This reflects the higher reliance of North America and Asia Pacific on aviation for their regional connectivity when compared to Europe (where other modes of transport also provide good connectivity), as well as variations in population density, travel distances and geography. It also reflects an **outward focus for European hubs**, which is the legacy of strong historical, political, economic and cultural ties with many parts of the world.

Overall, European hub connectivity is not only stronger, but also more balanced in the connectivity provided to different world regions – offering useful resilience against external shocks.

Second only to the Middle East in intercontinental hub connectivity

Intercontinental hub connectivity measures the connectivity offered by a hub airport between regions of the world other than the one in which that airport is located (e.g. connections offered by a European hub between North America and India or connections offered by a Middle East hub between Europe and Asia Pacific). While the largest European hubs have significantly higher intercontinental hub connectivity compared to that of North America or Asia Pacific, this is still only a fraction of the intercontinental hub connectivity boasted by the Middle Eastern hubs.

In fact, when the intercontinental hub connectivity scores of the largest global airports are compared, a clear geographical pattern emerges. **Middle Eastern hubs dominate**, followed by the largest European hubs. There is then a downward step in levels of intercontinental hub connectivity, where the North American hubs are positioned. Secondary European

hubs follow, with Asia Pacific hubs having the lowest scores. See Appendix E for this comparison in graph form.

This largely reflects the simple fact that **geography & population** matter hugely when it comes to intercontinental hub connectivity. Europe, located between Africa, Asia Pacific, the Middle East and North America is well positioned to connect different regions of the world. However, Europe also has a large population which has a high propensity to fly – and so air connectivity primarily focused on catering for this 'home market'. North America and Asia Pacific, while having large populations also (albeit with differing propensities to fly) are not nestled in between other world regions and therefore are far less attractive propositions for intercontinental hub connections.

In contrast, the Middle East and the Gulf in particular clearly has all the advantages when it comes to intercontinental hub connectivity. Tucked between Africa, Asia Pacific and Europe, and with an extremely limited immediate home market, airlines can (and indeed have no choice but to) focus on connecting different continents to each other.

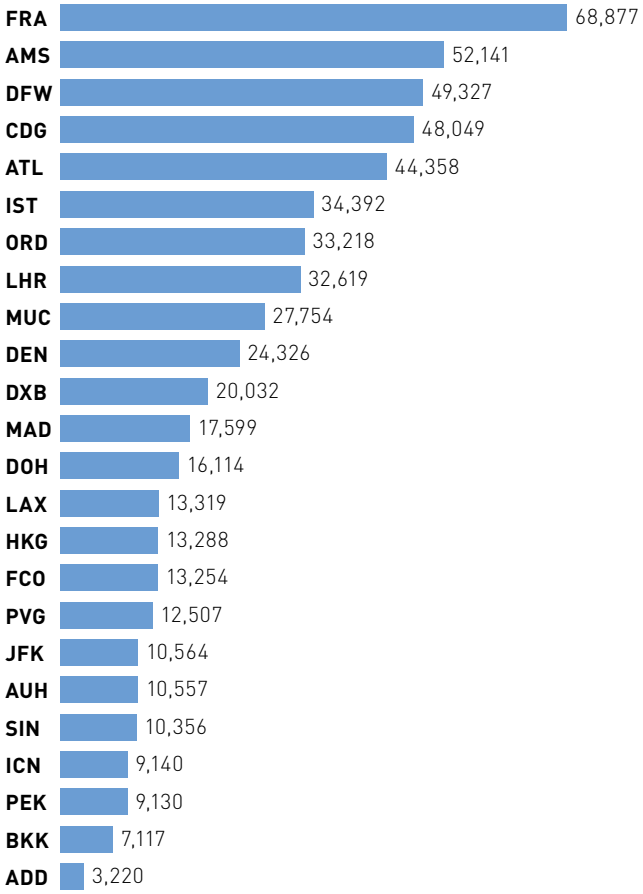
And while they can dominate this important niche intercontinental market, the wider connectivity benefits do have limits – the largest Middle Eastern hubs still fall well behind their European counterparts, when comparing overall hub connectivity or indeed hub connectivity from their region to other specific global regions. Nevertheless, this intercontinental hub connectivity does allow *'the creation of something out of nothing'*. The level of direct origin-destination demand at these Gulf States was unlikely to have ever supported the degree of connectivity that is enjoyed today.

Europe is no longer the sole global hub

But while Europe may continue to enjoy a pre-eminent central position in the global aviation network, this position is being rapidly challenged.

Looking at the growth rates of hub connectivity across the globe (Graph 22), between 2004 and 2016, **the rate of increase at many global hubs is a multiple of their**

15 Global Hub Connectivity Ranking (2016)

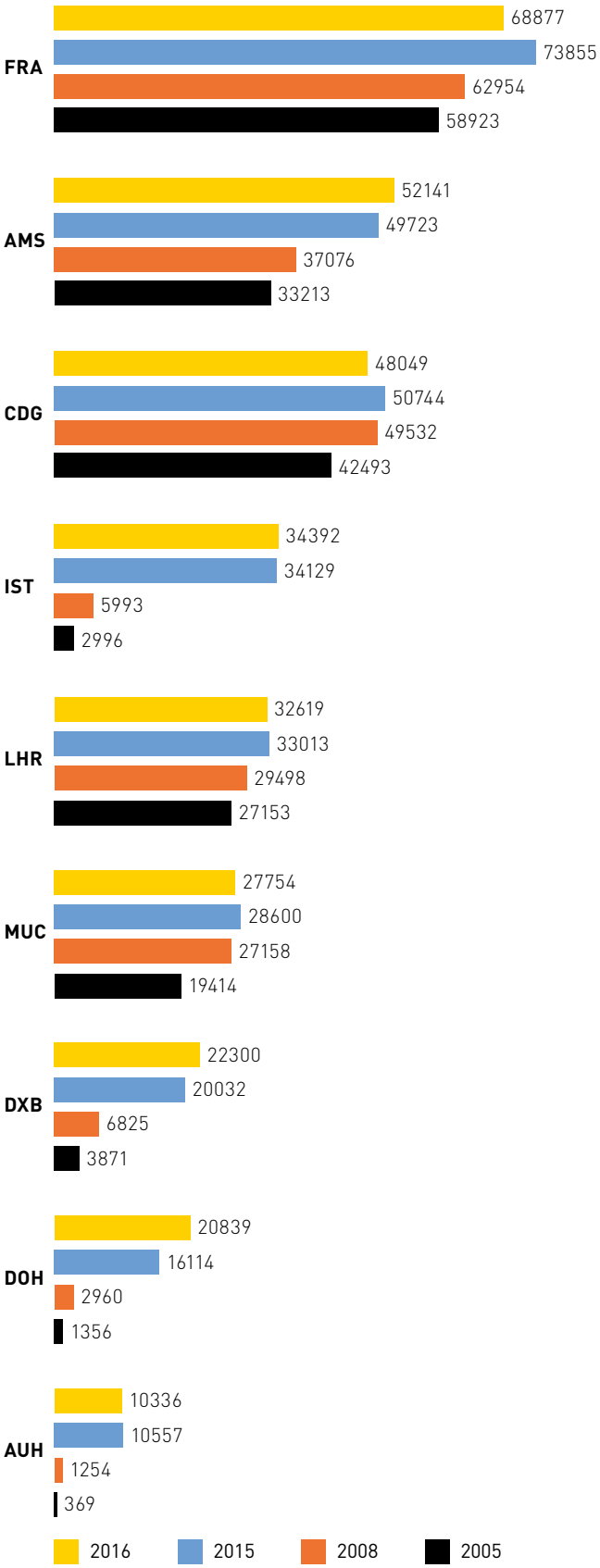


European counterparts. In this respect, the largest European hubs languish at the bottom of the league, with their North American counterparts.

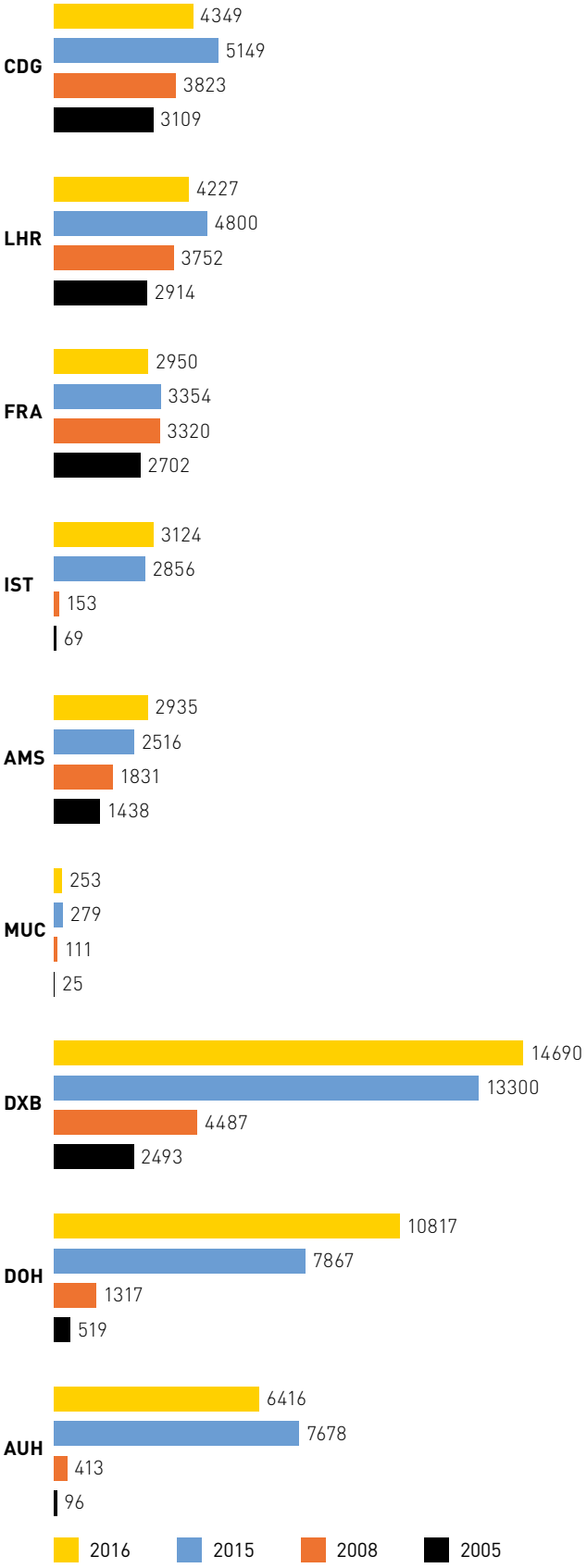
Of course this largely reflects **economic convergence** – emerging countries typically grow their economies at a faster rate, and there is a close link between a country's GDP per capita and its air connectivity levels. The Asian hubs, for example, have typically multiplied their hub connectivity by a factor of between **2** and **6** over the period.

The Middle Eastern hubs managed to grow their hub connectivity significantly beyond that of their Asian counterparts. Economic convergence played a role here too, but their advantageous **geographical position** combined with their **embrace of aviation as a strategic sector for their economy** has allowed them to 'super-charge' their growth. Hub connectivity at these airports has multiplied by a factor of between **18** and **25** since 2004.

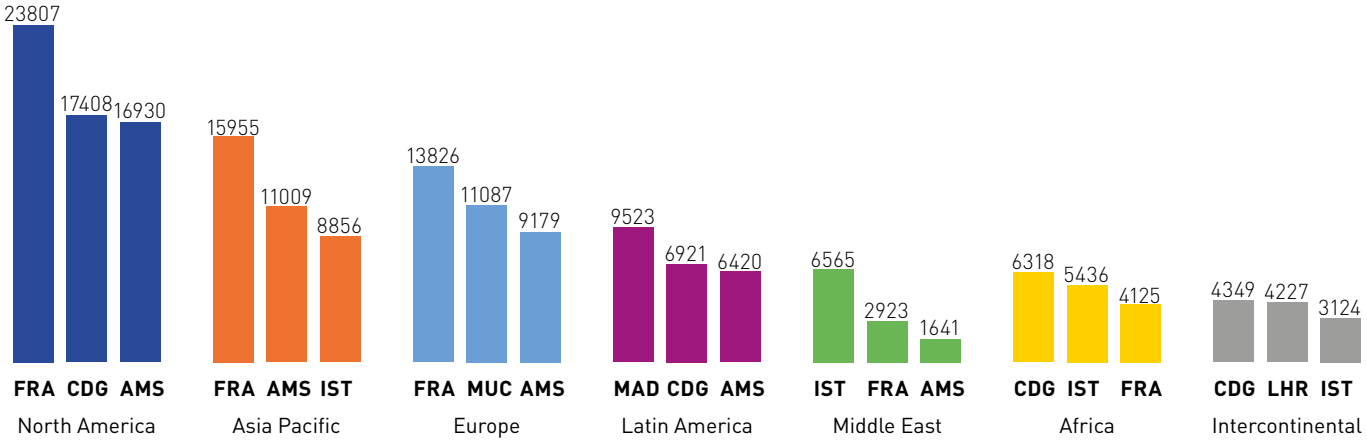
16 Total hub connectivity at selected global hubs (2005-2016)



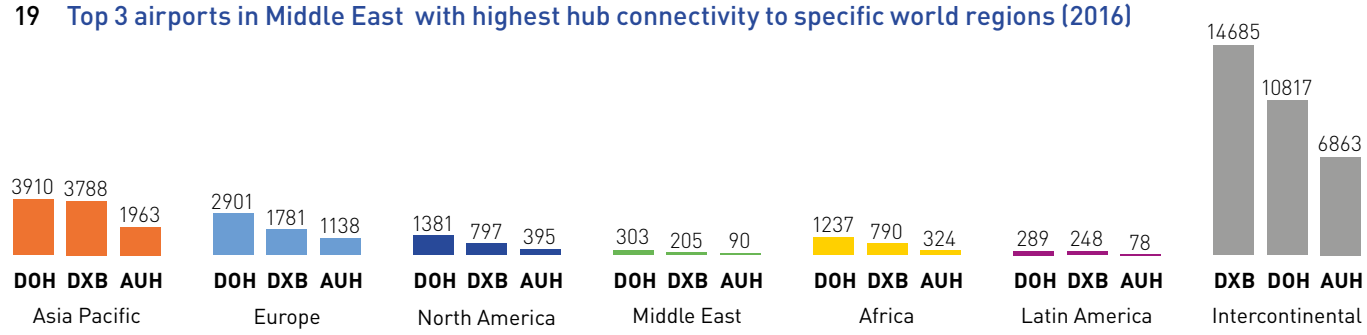
17 Intercontinental hub connectivity at selected global hubs (2005-2016)



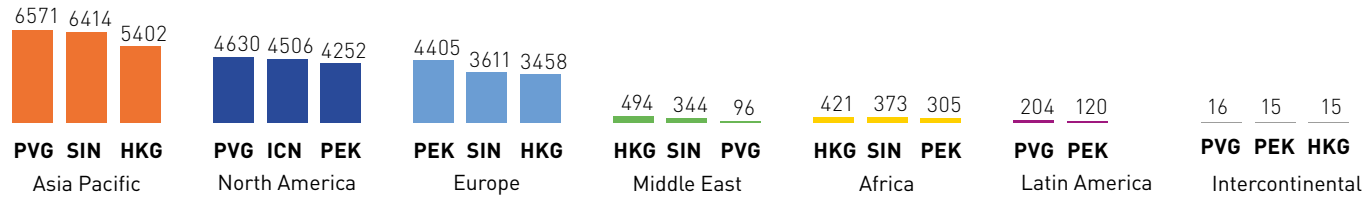
18 Top 3 airports in Europe with highest hub connectivity to specific world regions (2016)



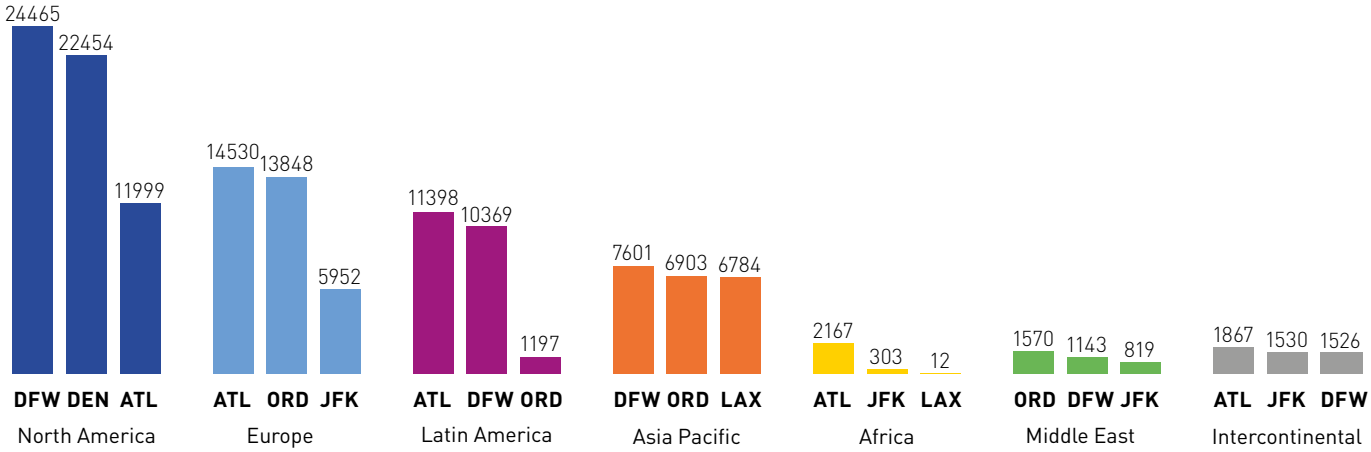
19 Top 3 airports in Middle East with highest hub connectivity to specific world regions (2016)



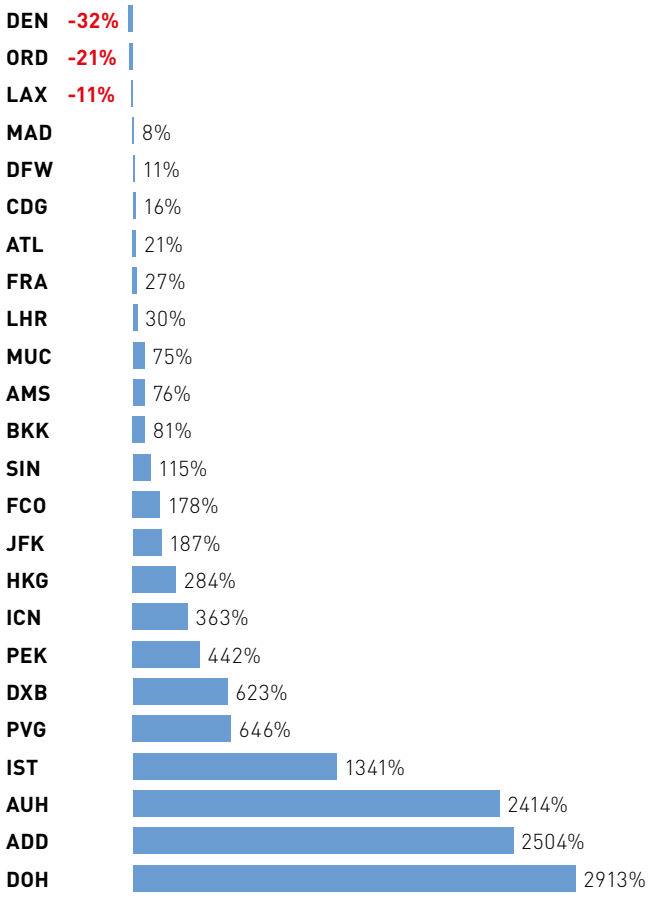
20 Top 3 airports in Asia Pacific with highest hub connectivity to specific world regions (2016)



21 Top 3 airports in North America with highest hub connectivity to specific world regions (2016)



22 Hub Connectivity growth at selected global hubs (2016 vs. 2004)



While Europe is no longer the sole global aviation hub, the rise of the Middle Eastern hubs should not automatically be considered an existential threat.

Firstly, European citizens benefit from the new connections afforded by these airports. And in time at least some of these indirect connections will facilitate new direct connections between Europe and the rest of the world.

Secondly, the Gulf States are in some senses operating from a severe competitive disadvantage – the lack of a significant underlying demand for origin-destination travel from the local population. Connecting traffic can grow quickly, but it is a very competitive segment of the market. Technological changes and wider shifts in global economies can disrupt and structurally change flows of transfer passengers. Dependence upon such markets also comes with its own vulnerabilities.

European Hubs: Competitive Dynamics & Varying Fortunes

Focusing on European hubs, the data reveals an evolving and an increasingly diversified picture in terms of their market positioning – resulting in the following segmentation:

➔ **'The Majors'**: this category comprises the **6 top European airports** in terms of **hub connectivity**: Frankfurt, Amsterdam Schiphol, Paris Charles de Gaulle, Istanbul Ataturk, London Heathrow and Munich airports. While their level of hub connectivity clearly sets them apart from other airports in Europe, a closer look reveals significant differences in the geographical distribution of their hubbing capabilities (See details in Appendix E).

- **Frankfurt** is clearly the **best connected hub** not just in Europe but worldwide, with the highest level of hub connectivity. Frankfurt's hub connectivity is primarily focused on North America, Asia Pacific and intra-Europe as it provides the best hub connectivity of all European airports to these regions – which are the largest segments of Europe's overall connectivity market.

- **Amsterdam Schiphol** comes out as the **second European hub**, with a reasonably balanced geographical spread in terms of its hub connectivity. While it does not provide the best hub connectivity to any one world region, it ranks amongst the top 3 hubs for all of these markets, with the exception of Africa and the intercontinental hub connectivity market.

- **Paris Charles de Gaulle** ranks in **3rd place for overall hub connectivity** – with the strongest hub connectivity from Europe both to Africa and on the intercontinental market, complimented by strong positions to North America and Latin America.

- **Istanbul Ataturk** now ranks in **4th place** in terms of overall hub connectivity (up from 13th place back in 2006) and is **the newcomer** amongst the Majors. It provides the best hub connectivity out of Europe to the Middle East

and is also well placed for hub connectivity to Africa, Asia Pacific and on the intercontinental market.

- **London Heathrow** comes in **5th position**. While almost 50% of the hub connectivity it offers is to North America, Frankfurt, Paris Charles de Gaulle and Amsterdam Schiphol airports all have higher levels of hub connectivity to North America. London Heathrow ranks 2nd in terms of intercontinental hub connectivity (after Paris Charles de Gaulle).

- **Munich** closes the Majors hub group, with a very strong focus on **intra-European hub connectivity**.

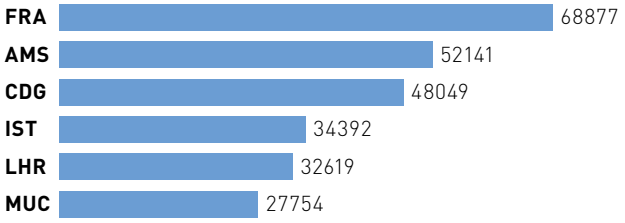
Looking at the past 10 years, these hubs have followed different paths, which reflect a combination of **local circumstances** (including airport capacity constraints, terminal infrastructure developments and the fate of their home based hub carrier) as well as **increased competition**:

The largest hubs in terms of passenger traffic (London Heathrow, Paris Charles de Gaulle and Frankfurt) have seen their hub connectivity growing at a lower & varied pace (+17%, +4% & +12% respectively). It is interesting to note that over the same period, all 3 have also experienced some losses in direct connectivity (-3%, -5% & -1% respectively).

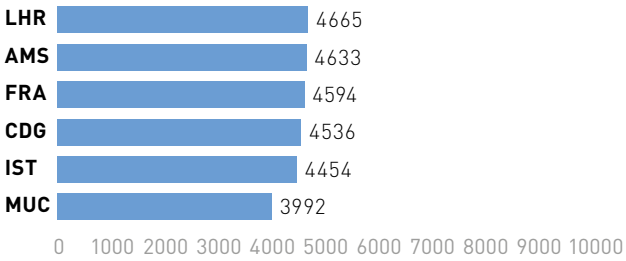
Meanwhile, while Istanbul Ataturk stands out with exceptional growth in both hub connectivity (+772%) and direct connectivity (+146%), Amsterdam Schiphol and Munich airports have also registered significant gains in both hub connectivity (+60% & +43%) and direct connectivity (+18% & +7%). **These airports have clearly been challenging their peers.** Amsterdam Schiphol now has the 2nd highest hub connectivity, replacing Paris Charles de Gaulle, while Munich Airport has secured its place amongst the Majors.

Their evolution in terms of direct connectivity is also noteworthy. While their ranking differs

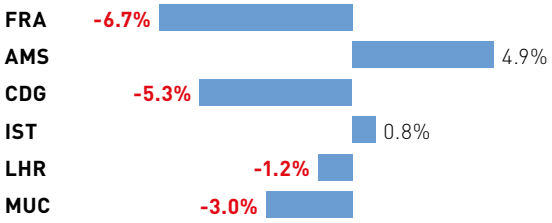
23 Hub connectivity: Top 6 European airports (2016)



24 Direct connectivity: Top 6 European airports (2016)



25 Hub connectivity growth: Top 6 European hubs (2016 vs. 2015)



when compared to hub connectivity – with London Heathrow offering the **highest level of direct connectivity in Europe** – absolute direct connectivity levels have converged in recent years (with the exception of Munich airport).

➔ The 'Secondary Hubs', which is made-up of the **'Come Back hubs'** and the **'New Kids on the Block'**.

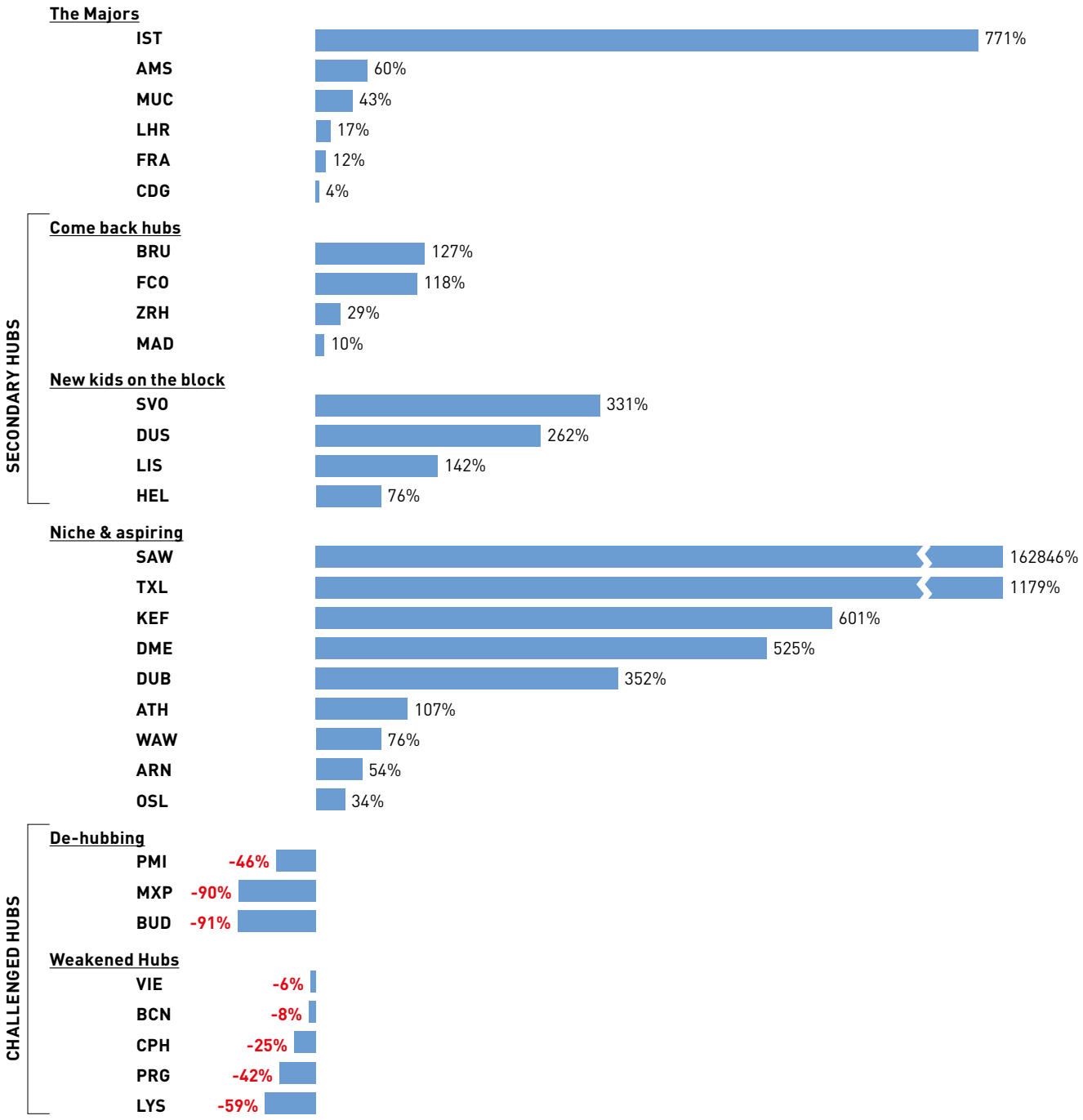
- The **'Come Back Hubs'** include **Madrid**, **Zurich**, **Rome Fiumicino** and **Brussels airports**. These are airports which managed to **recover/protect their market position** as secondary hubs, after having experienced a **traumatic de-hubbing** process following the bankruptcy or shifts in strategy of their home-based carriers or after having been affected by the restructuring of these carriers.

Brussels and Rome Fiumicino airports have significantly recovered previous hub connectivity losses since 2006 (+127% & +118%), as well as to a lesser extent Zurich (+29%) and Madrid airports (+10%) – with the latter now providing the best European hub connectivity to Latin America). The airports in this group have essentially maintained their ranking in terms of hub connectivity, with the exception of Brussels, which moved from 17th to 13th position.

This hub recovery process has also come with significant gains in direct connectivity at Brussels (+20%), Rome Fiumicino (+11%), Zurich (+14%) but not Madrid (-12%).

- **The 'New Kids on the Block'** include **Moscow Sheremetyevo**, **Helsinki**, **Lisbon** and **Düsseldorf airports**. These airports have all made **significant gains in hub connectivity** since 2006 (+331%,

26 Hub connectivity growth at largest European hubs (2016 vs. 2006)

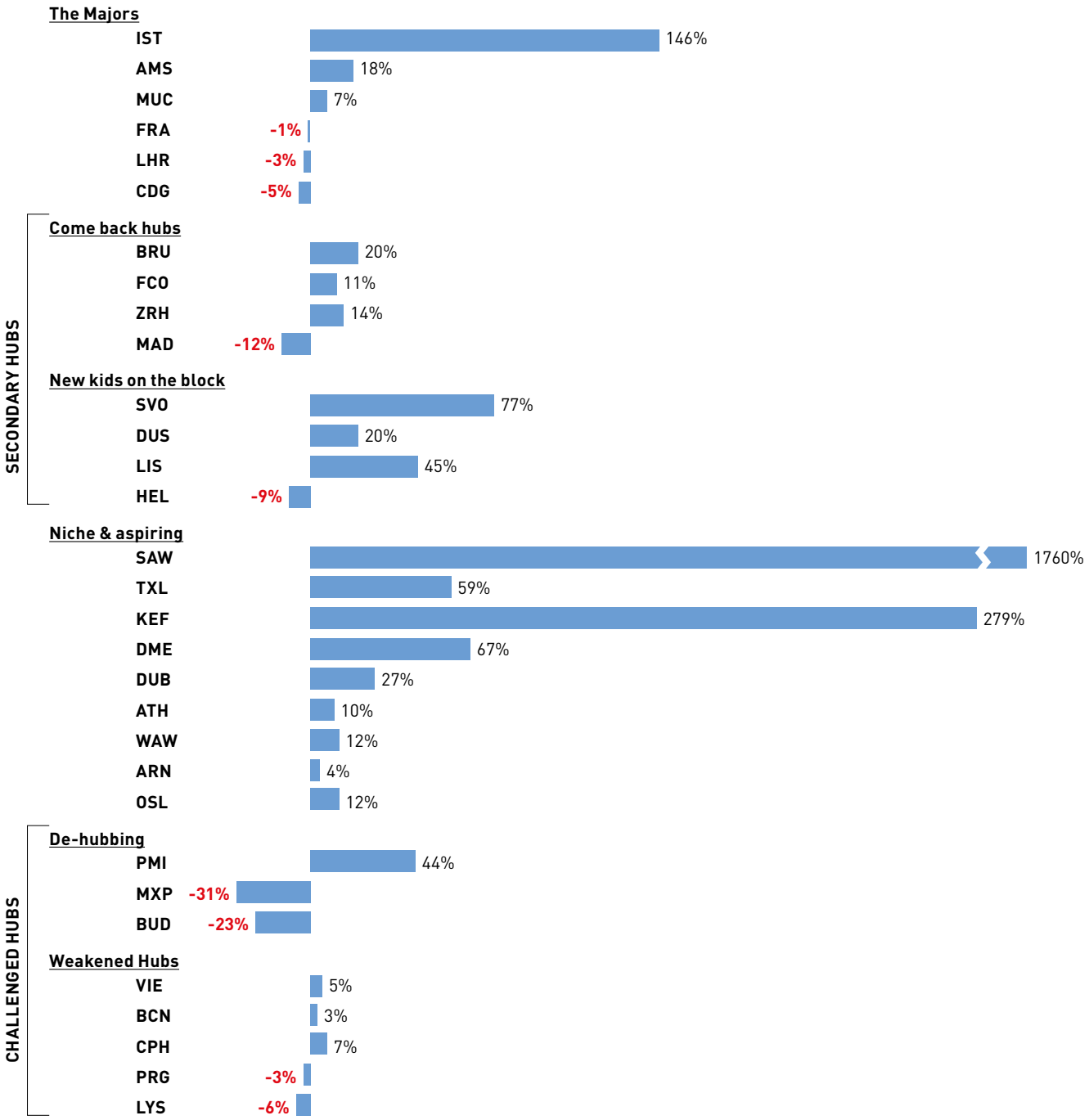


+76%, +142% & +262% respectively) mainly reflecting the development of hub operations by Aeroflot, Finnair, TAP and Air Berlin and Eurowings.

These hubs are **providing new & increased competition for hub connectivity**. While Helsinki has maintained its hub connectivity ranking over the past 10 years (12th position), Moscow Sheremetyevo has jumped from the 14th to 8th position, Lisbon from 19th to 15th and Düsseldorf from 25th to 16th.

These secondary hubs have also seen a **significant increase in their direct connectivity levels**, with the exception of Helsinki (-9%). Direct connectivity since 2006 has increased by + 20% at Düsseldorf, +45% at Lisbon and +77% at Moscow Sheremetyevo.

27 Direct connectivity growth at largest European hubs (2016 vs. 2006)



➔ **The 'Niche & Aspiring Hubs'**. These hubs have a lower hub connectivity level than secondary hubs, but have experienced **rapid growth** since 2006 – sometimes exponentially. Back then, they could either not be considered as hubs given their low levels of hub connectivity – such as **Istanbul Sabiha Gocken** (which grew by +162846%), **Berlin Tegel** (by +1179%), **Dublin** (by +352%) and **Moscow Domodedovo** (by +525%) – or they had rather marginal or low levels of hub connectivity – such as **Keflavik** (which grew by +601%), **Athens** (by +107%), **Warsaw** (by +76%), **Stockholm Arlanda** (by +54%) and **Oslo** (by +34%).

These hubs are clearly providing **new & increased competition for hub connectivity**. They have been working on their **niche positioning** (in particular transatlantic flows for Keflavik, Dublin and Oslo airports) or **regional connecting flows** (such as Istanbul Sabiha Gocken, Athens and Stockholm Arlanda airports). They have managed to develop their network by leveraging new aircraft technology, Open Skies policies, low cost airline developments and effective network airline restructuring.

All of them have in parallel achieved **gains in direct connectivity** since 2006 – in particular Istanbul Sabiha Gocken (+1760%), Keflavik (+279%), Moscow Domodedovo (+67%) and (+27%).

➔ **'The Challenged Hubs'**. These are airports which have **lost significant hub connectivity** over the past 10 years – either because of airline de-hubbing or the weakness of their home-based carrier: **Barcelona**, **Milano Malpensa**, **Budapest**, **Prague**, **Copenhagen**, **Vienna**, **Lyon-Saint Exupéry** and **Palma de Mallorca airports**.

The de-hubbing at Budapest and Milano Malpensa airports had the greatest impact on hub connectivity (-91% & -90% respectively) resulting in these airports **losing their 'national hub' status**. Similarly, Prague (-42%), Palma de Mallorca (-46%) and Lyon (-59%) have all seen their **hub status eroded** following significantly scaled down operations by their home based network carrier. For all these airports, the de-hubbing translated in **losses in direct connectivity** – with the exception of Palma de Mallorca, where direct connectivity grew significantly (+44%).

Copenhagen and Vienna airports remain hubs, but their hub connectivity levels have decreased significantly (-25% & -6%). Barcelona is now predominantly a point-to-point airport, and has seen hub connectivity levels decrease in the wake of the global financial crisis (-14% since 2008). These airports have however managed to post **direct connectivity gains** over the same period – pointing to a renewed focus on developing the network with point-to-point services, in addition to hub and spoke.

APPENDICES

Appendix A Direct, indirect and airport connectivity

	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008	2016 vs. 2006
Direct connectivity	4.5%	4.6%	8.9%	19.4%
Indirect connectivity	0.4%	11.1%	27.5%	41.7%
Airport connectivity	1.7%	8.9%	20.7%	33.4%

Appendix B Connectivity by world region

Table 1 Direct, indirect & airport connectivity at EU airports by world region

EU	Direct			Indirect			Airport		
	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008
Africa	-12.6%	1.7%	12.5%	-0.6%	7.1%	23.2%	-2.7%	6.1%	21.4%
Asia Pacific	0.6%	1.9%	5.3%	2.2%	15.5%	49.2%	2.1%	15.0%	47.5%
Europe	5.7%	4.3%	0.9%	1.1%	8.6%	13.1%	3.8%	6.1%	5.6%
Latin America	5.5%	-0.9%	1.8%	10.4%	8.7%	35.6%	10.1%	8.2%	33.5%
Middle East	4.6%	13.0%	51.0%	2.4%	28.1%	77.8%	2.7%	26.1%	74.1%
North America	2.9%	5.8%	-0.4%	-0.6%	11.0%	11.5%	-0.5%	10.8%	10.9%

Table 2 Direct, indirect & airport connectivity at non-EU airports by world region

Non-EU	Direct			Indirect			Airport		
	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008
Africa	-6.7%	8.8%	113.5%	-6.4%	3.7%	69.2%	-6.4%	4.3%	73.8%
Asia Pacific	9.2%	6.5%	77.8%	-2.9%	18.0%	104.4%	-1.9%	16.9%	101.5%
Europe	2.1%	5.0%	43.4%	-5.6%	6.8%	35.3%	-1.4%	5.8%	39.7%
Latin America	17.2%	-9.6%	71.1%	1.7%	2.8%	72.3%	1.8%	2.6%	72.3%
Middle East	15.9%	14.0%	262.7%	-3.3%	25.4%	127.5%	3.0%	21.5%	163.8%
North America	13.8%	9.9%	88.4%	-1.4%	9.2%	46.3%	-0.8%	9.2%	47.7%

Table 3 Direct, indirect & airport connectivity at European airports by world region

Total Europe	Direct			Indirect			Airport		
	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008
Africa	-11.8%	2.6%	20.7%	-1.7%	6.4%	29.2%	-3.3%	5.8%	27.8%
Asia Pacific	3.8%	3.6%	25.7%	1.4%	15.9%	55.7%	1.4%	15.3%	54.2%
Europe	4.9%	4.5%	8.2%	-0.6%	8.1%	17.9%	2.5%	6.0%	12.0%
Latin America	5.9%	-1.1%	3.0%	9.3%	7.9%	38.9%	9.2%	7.5%	36.9%
Middle East	8.8%	13.4%	95.8%	1.6%	27.7%	83.0%	2.7%	25.3%	85.0%
North America	4.2%	6.3%	6.5%	-0.7%	10.8%	15.3%	-0.5%	10.6%	14.9%

Appendix C Airports with direct, indirect & airport connectivity in 2016 below 2008 levels

	Direct	Indirect	Airport
EU	48.3%	30.9%	31.3%
Non-EU	21.0%	16.1%	15.3%
Total	39.4%	26.1%	26.1%

Appendix D Hub connectivity by world region

Hub Connectivity	2016 vs. 2015	2015 vs. 2014	2016 vs. 2008
Europe-Africa	-2.9%	2.4%	21.1%
Europe-Asia	0.0%	4.7%	26.8 %
Europe-Latin America	7.4%	4.5%	25.4 %
Europe-Middle East	-0.4%	5.5%	65.6 %
Europe-North America	3.0%	6.9%	22.5 %
Intercontinental	-1.3%	2.1%	39.5 %
Intra-Europe	-0.8%	6.3%	19.7 %
Total	1.0%	5.5%	24.9 %

Appendix E Total hub connectivity & intercontinental hub connectivity (2016 vs. 2006, 2008 & 2015)

Total hub connectivity

2016 vs...	2006	2008	2015
AUH	3435.5%	724.5%	-2.1%
DOH	1084.7%	603.9%	29.3%
DXB	351.1%	226.7%	11.3%
IST	771.1%	473.9%	0.8%
LHR	17.0%	10.6%	-1.2%
CDG	3.8%	-3.0%	-5.3%
FRA	12.3%	9.4%	-6.7%
AMS	60.2%	40.6%	4.9%
MUC	88.4%	60.3%	16.6%

Intercontinental hub connectivity

2016 vs...	2006	2008	2015
AUH	6409.7%	1455.0%	-16.4%
DOH	1379.3%	721.4%	37.5%
DXB	356.0%	227.4%	10.4%
IST	3287.5%	1936.8%	9.4%
LHR	30.2%	12.7%	-5.2%
CDG	25.9%	13.8%	-8.3%
FRA	-6.7%	-11.1%	-11.8%
AMS	43.0%	2.2%	-3.0%
MUC	485.3%	127.9%	-9.1%

Chart 1 Hub connectivity between EU and world regions (2016 vs. 2015)

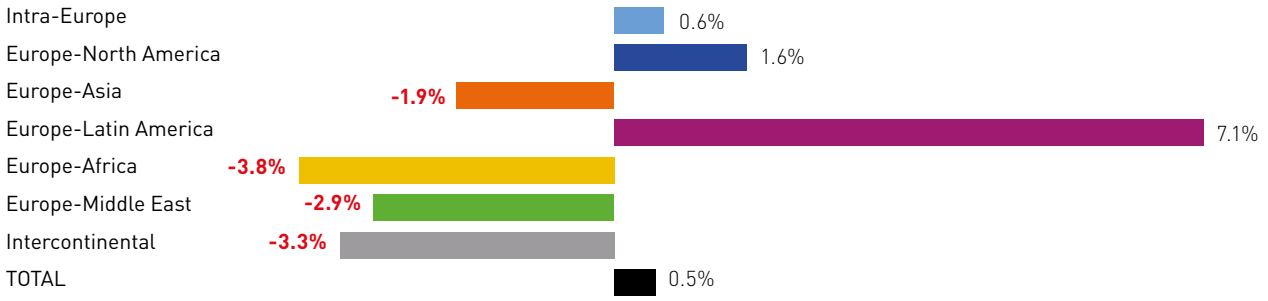


Chart 2 Hub connectivity between Europe and world regions (2016 vs. 2008)

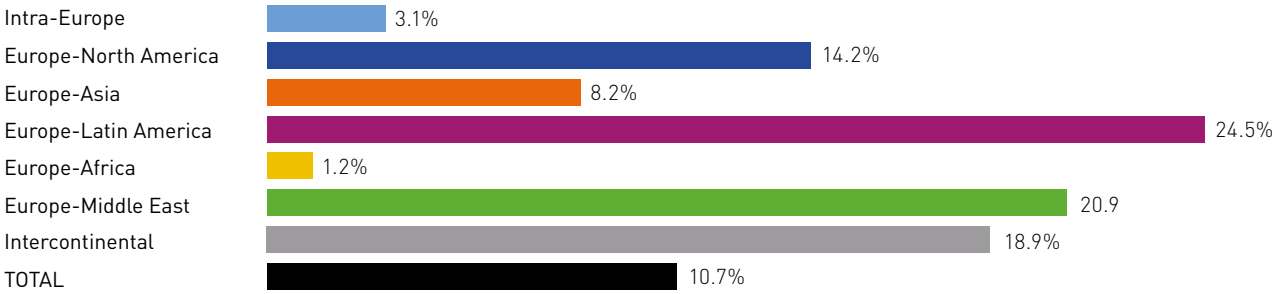
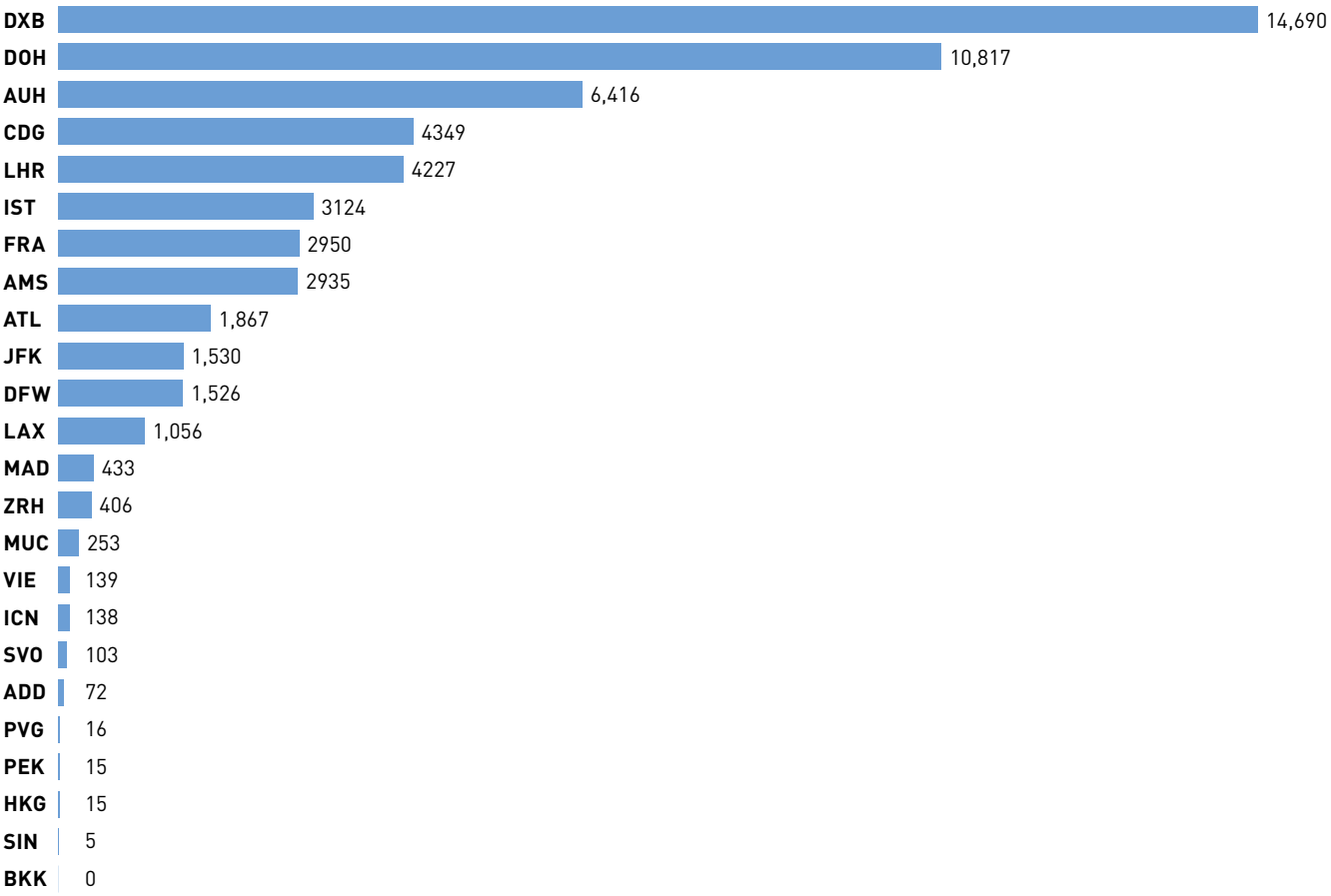


Chart 3 Intercontinental hub connectivity at selected global hubs (2016)



Share of hub connectivity by connecting market at top 7 European hubs (2016)

Chart 4 FRA

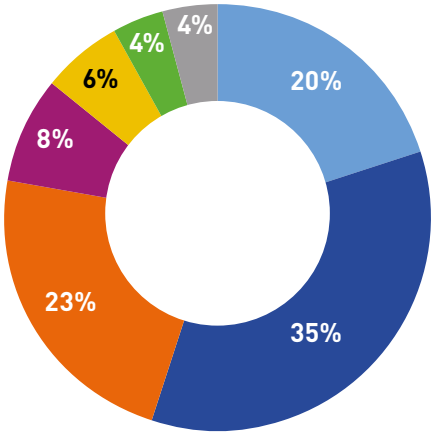


Chart 5 AMS

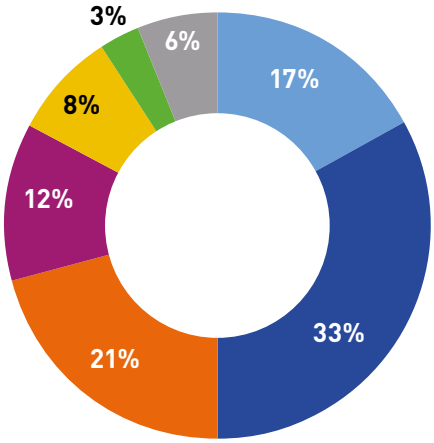


Chart 6 CDG

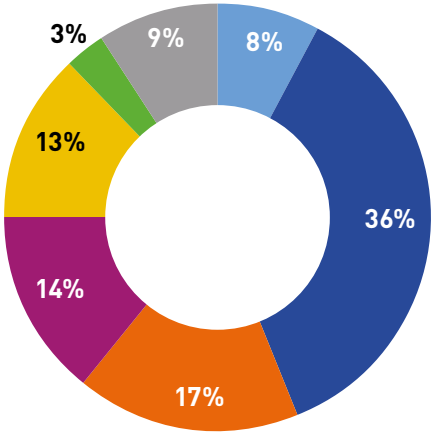


Chart 7 IST

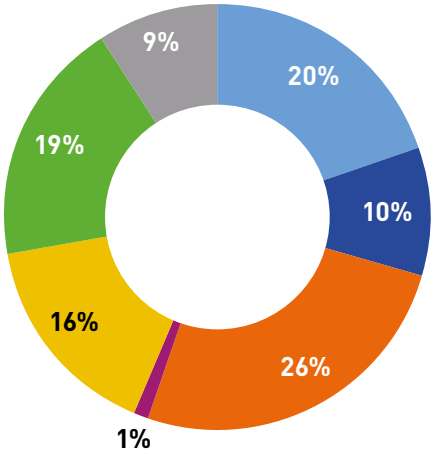


Chart 8 LHR

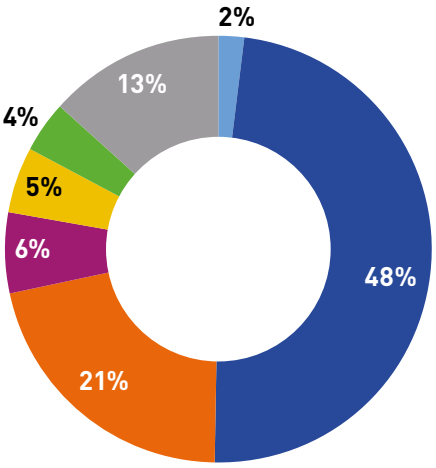


Chart 9 MUC

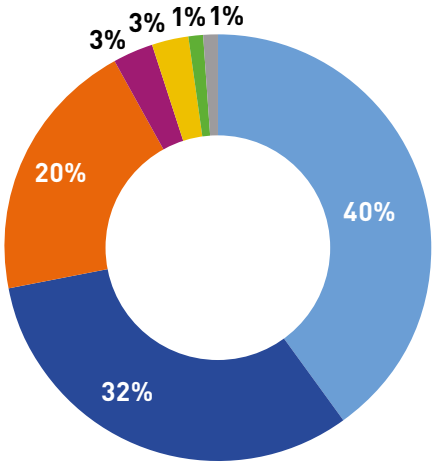
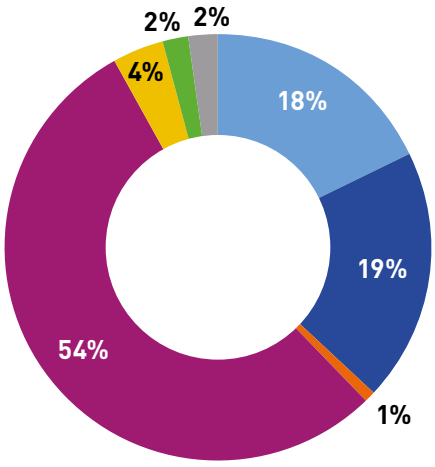


Chart 10 MAD



Appendix F Airport connectivity (2016) & GDP (2014) by European country

COUNTRY	CONNECTIVITY			HUB	GDP (m€)
	Direct	Indirect	Total		
Albania	183	565	748	1	10 008
Austria	2 857	7 811	10 668	13 442	329 381
Belarus	389	737	1 126	23	57 312
Belgium	2 868	6 083	8 950	6 579	400 746
Bosnia and Herzegovina	87	445	533	1	13 942
Bulgaria	680	1 759	2 439	38	42 692
Croatia	1 010	2 698	3 708	12	43 034
Cyprus	544	959	1 503	24	17 398
Czech Republic	1 406	3 436	4 841	1 460	154 513
Denmark	2 963	7 105	10 068	5 859	260 534
Estonia	360	1 180	1 539	13	19 952
Finland	2 105	5 263	7 368	8 513	205 321
France	14 275	28 149	42 424	50 190	2 132 997
Georgia	254	620	874	1	12 431
Germany	18 797	48 307	67 103	104 955	2 916 400
Greece	4 972	7 067	12 040	2 998	177 605
Hungary	853	2 680	3 533	97	104 138
Iceland	563	927	1 490	2 517	12 916
Ireland	2 600	6 552	9 152	3 279	188 795
Israel	1 079	4 150	5 228	101	230 089
Italy	11 306	26 900	38 206	15 380	1 612 297
Kosovo	119	524	643	1	5 569
Latvia	634	1 148	1 782	267	23 587
Lithuania	442	717	1 159	5	36 483
Luxembourg	462	1 550	2 012	--	48 910
FYROM	142	306	448	--	8 531
Malta	389	1 033	1 422	13	8 108
Moldova	187	469	656	24	6 009
Monaco	646	3	649	--	5 320
Montenegro	225	505	730	3	3 459
Netherlands	5 064	10 963	16 027	52 175	662 940
Norway	7 615	7 983	15 598	4 296	376 755
Poland	2 434	5 558	7 992	3 105	410 130
Portugal	3 651	7 142	10 793	5 336	173 490
Romania	1 452	3 010	4 462	281	150 075
Russian Federation	7 972	10 938	18 910	19 184	1 527 752
Serbia	589	1 421	2 010	297	33 279
Slovakia	117	48	166	4	75 520
Slovenia	213	914	1 127	70	37 313
Spain	16 917	26 664	43 582	21 386	1 041 428
Sweden	5 136	9 179	14 315	3 572	429 884
Switzerland	4 612	13 803	18 415	16 869	527 834
Turkey	12 140	12 551	24 691	37 595	600 927
Ukraine	744	1 786	2 531	926	99 618
United Kingdom	17 672	38 384	56 056	37 372	2 251 931

Appendix G Direct, indirect and airport connectivity by individual airport

AIRPORT		CONNECTIVITY					
		Absolute 2016			Growth 2016 vs. 2015		
IATA code		direct	indirect	airport	direct	indirect	airport
LHR	London	4665	20466	25131	-2.0%	3.0%	2.0%
AMS	Amsterdam	4633	10804	15437	5.5 %	-3.1 %	-0.6 %
FRA	Frankfurt	4594	13017	17611	-3.1 %	-5.5 %	-4.8 %
CDG	Paris	4536	14353	18889	0.6 %	-3.4 %	-2.5 %
IST	Istanbul	4454	5149	9602	4.6 %	-5.3 %	-1.0 %
MUC	Munich	3992	9027	13019	5.0 %	-0.5 %	1.1 %
MAD	Madrid	3516	7680	11196	1.5 %	0.4 %	0.8 %
FCO	Rome	3273	7844	11117	-3.7 %	-0.4 %	-1.4 %
BCN	Barcelona	3029	6656	9686	3.0 %	7.0 %	5.7 %
LGW	London	2743	1426	4169	-1.3 %	15.5 %	3.9 %
CPH	Copenhagen	2596	5692	8289	4.2 %	2.9 %	3.3 %
SVO	Moscow	2517	2369	4887	1.6 %	-5.9 %	-2.2 %
ORY	Paris	2482	1254	3736	-1.0 %	5.0 %	1.0 %
ZRH	Zurich	2418	7214	9632	0.7 %	-1.8 %	-1.2 %
VIE	Vienna	2380	5103	7482	-0.4 %	-0.5 %	-0.5 %
OSL	Oslo	2362	3655	6017	0.5 %	0.3 %	0.4 %
ARN	Stockholm	2345	4963	7307	16.4 %	1.9 %	6.2 %
BRU	Brussels	2300	6015	8315	1.6 %	2.8 %	2.4 %
DUS	Düsseldorf	2296	5609	7906	5.9 %	5.0 %	5.2 %
SAW	Istanbul	2281	637	2918	22.8 %	3.3 %	18.0 %
PMI	Palma De Mallorca	2129	1414	3543	4.7 %	12.7 %	7.7 %
DUB	Dublin	2110	5348	7459	5.6 %	4.7 %	4.9 %
TXL	Berlin	1934	5130	7063	3.3 %	3.1 %	3.2 %
DME	Moscow	1899	2137	4036	-15.3 %	-19.9 %	-17.8 %
ATH	Athens	1868	3997	5865	8.1 %	8.5 %	8.3 %
LIS	Lisbon	1839	4756	6595	10.9 %	2.0 %	4.3 %
NCE	Nice	1839	3038	4877	21.6 %	5.9 %	11.3 %
MAN	Manchester	1795	4735	6529	3.8 %	1.6 %	2.2 %
HEL	Helsinki	1577	3234	4811	4.8 %	0.5 %	1.9 %
HAM	Hamburg	1547	4661	6208	4.0 %	-2.7 %	-1.1 %
MXP	Milan	1531	4434	5966	2.4 %	-0.6 %	0.2 %
STN	London	1500	184	1684	0.5 %	-2.9 %	0.1 %
GVA	Geneva	1453	4835	6288	0.3 %	-1.2 %	-0.8 %
WAW	Warsaw	1336	3023	4359	9.3 %	3.5 %	5.2 %
PRG	Prague	1291	3359	4651	11.5 %	6.6 %	7.9 %
AGP	Malaga	1211	1776	2987	8.4 %	-3.4 %	1.0 %
EDI	Edinburgh	1147	2806	3953	7.7 %	-3.6 %	-0.6 %
STR	Stuttgart	1133	2926	4059	1.2 %	-6.5 %	-4.5 %
LED	St Petersburg	1090	2198	3288	-11.4 %	-3.2 %	-6.1 %
LYS	Lyon	1087	2228	3315	2.7 %	-7.0 %	-4.0 %
AYT	Antalya	1055	909	1964	2.7 %	-6.3 %	-1.7 %
BHX	Birmingham	1035	2891	3926	10.6 %	11.0 %	10.9 %
CGN	Cologne	1022	1163	2185	13.5 %	-16.7 %	-4.9 %
OTP	Bucharest	982	2314	3296	34.0 %	-6.4 %	2.8 %

AIRPORT		CONNECTIVITY					
		Growth 2016 vs. 2008			Growth 2016 vs. 2006		
IATA code		direct	indirect	airport	direct	indirect	airport
LHR	London	-2.4%	40.8%	30.1%	-2.6%	74.7%	52.3%
AMS	Amsterdam	15.1 %	12.4 %	13.2 %	18.4 %	16.1 %	16.8 %
FRA	Frankfurt	-0.2 %	11.2 %	8.0 %	-1.2 %	17.2 %	11.7 %
CDG	Paris	-10.5 %	21.7 %	12.0 %	-5.4 %	38.1 %	24.4 %
IST	Istanbul	111.2 %	64.3 %	83.2 %	145.8 %	178.7 %	162.4 %
MUC	Munich	-3.3 %	33.3 %	19.4 %	7.2 %	53.3 %	35.5 %
MAD	Madrid	-21.1 %	32.0 %	9.0 %	-11.6 %	44.1 %	20.3 %
FCO	Rome	-6.9 %	33.2 %	18.2 %	11.5 %	48.0 %	35.0 %
BCN	Barcelona	-2.1 %	25.9 %	15.6 %	2.8 %	35.1 %	23.0 %
LGW	London	10.2 %	-43.1 %	-16.5 %	29.4 %	-64.2 %	-31.6 %
CPH	Copenhagen	0.3 %	28.5 %	18.1 %	6.6 %	34.4 %	24.3 %
SVO	Moscow	65.1 %	14.9 %	36.2 %	76.9 %	8.3 %	35.3 %
ORY	Paris	7.3 %	92.2 %	26.0 %	7.6 %	62.9 %	21.4 %
ZRH	Zurich	6.2 %	28.4 %	22.0 %	14.3 %	33.2 %	27.9 %
VIE	Vienna	-7.0 %	21.8 %	10.9 %	5.0 %	38.8 %	25.9 %
OSL	Oslo	4.5 %	25.2 %	16.2 %	12.4 %	38.8 %	27.1 %
ARN	Stockholm	3.0 %	10.4 %	7.9 %	4.4 %	24.5 %	17.3 %
BRU	Brussels	5.3 %	25.7 %	19.3 %	19.8 %	32.8 %	28.9 %
DUS	Düsseldorf	6.0 %	24.6 %	18.5 %	19.5 %	43.1 %	35.3 %
SAW	Istanbul	1009.3 %	1232.6 %	1051.4 %	1759.6 %	2031.7 %	1812.9 %
PMI	Palma De Mallorca	24.5 %	110.3 %	48.8 %	44.2 %	157.5 %	74.9 %
DUB	Dublin	13.5 %	59.2 %	43.0 %	27.3 %	57.4 %	47.5 %
TXL	Berlin	25.4 %	43.3 %	38.0 %	58.8 %	57.2 %	57.6 %
DME	Moscow	16.7 %	18.5 %	17.7 %	67.5 %	382.4 %	155.9 %
ATH	Athens	7.1 %	19.5 %	15.3 %	9.7 %	44.1 %	31.0 %
LIS	Lisbon	40.0 %	39.5 %	39.6 %	44.9 %	38.1 %	39.9 %
NCE	Nice	3.5 %	23.6 %	15.2 %	18.3 %	21.2 %	20.1 %
MAN	Manchester	1.7 %	17.2 %	12.5 %	6.9 %	14.8 %	12.5 %
HEL	Helsinki	-11.7 %	9.2 %	1.4 %	-9.0 %	23.2 %	10.4 %
HAM	Hamburg	-1.5 %	24.2 %	16.6 %	11.2 %	44.1 %	34.2 %
MXP	Milan	-12.0 %	4.7 %	-0.1 %	-30.9 %	17.0 %	-0.7 %
STN	London	-12.6 %	19.1 %	-10.0 %	-15.4 %	30.4 %	-12.0 %
GVA	Geneva	20.4 %	35.8 %	31.9 %	40.4 %	48.3 %	46.4 %
WAW	Warsaw	5.0 %	14.6 %	11.5 %	11.6 %	22.5 %	18.9 %
PRG	Prague	-14.6 %	19.2 %	7.4 %	-3.3 %	43.3 %	26.4 %
AGP	Malaga	15.9 %	39.8 %	29.0 %	15.9 %	42.4 %	30.3 %
EDI	Edinburgh	4.1 %	31.9 %	22.5 %	3.1 %	33.1 %	22.8 %
STR	Stuttgart	-12.8 %	9.9 %	2.5 %	-5.6 %	16.0 %	9.0 %
LED	St Petersburg	29.8 %	39.2 %	35.9 %	48.6 %	109.7 %	84.5 %
LYS	Lyon	-11.2 %	0.7 %	-3.5 %	-6.1 %	7.7 %	2.8 %
AYT	Antalya	145.9 %	273.2 %	192.0 %	161.0 %	311.7 %	214.2 %
BHX	Birmingham	6.0 %	38.9 %	28.4 %	4.7 %	37.9 %	27.3 %
CGN	Cologne	-3.8 %	4.1 %	0.2 %	2.0 %	-10.3 %	-4.9 %
OTP	Bucharest	61.6 %	11.0 %	22.4 %	90.5 %	36.7 %	49.3 %

AIRPORT		CONNECTIVITY					
		Absolute 2016			Growth 2016 vs. 2015		
IATA code		direct	indirect	airport	direct	indirect	airport
TLV	Tel-Aviv	980	4150	5129	5.9 %	1.7 %	2.5 %
LIN	Milan	977	2657	3634	0.1 %	-4.3 %	-3.2 %
ESB	Ankara	940	1156	2096	15.1 %	2.0 %	7.5 %
VCE	Venice	918	3649	4567	12.8 %	5.5 %	6.9 %
GLA	Glasgow	890	1776	2666	4.1 %	15.2 %	11.3 %
ALC	Alicante	888	677	1565	11.4 %	5.9 %	8.9 %
BUD	Budapest	853	2680	3533	4.8 %	3.7 %	4.0 %
LCY	London	842	992	1834	4.2 %	11.2 %	7.9 %
MRS	Marseille	837	1817	2655	0.5 %	-3.2 %	-2.1 %
TLS	Toulouse	810	1984	2795	1.4 %	-5.8 %	-3.8 %
BGO	Bergen	789	897	1686	-4.5 %	-12.0 %	-8.6 %
SXF	Berlin	763	466	1230	38.6 %	20.7 %	31.2 %
LPA	Gran Canaria	762	647	1408	9.7 %	4.7 %	7.4 %
IBZ	Ibiza	758	526	1285	6.9 %	26.6 %	14.2 %
OPO	Porto	735	1364	2099	8.0 %	9.7 %	9.1 %
TRD	Trondheim	690	734	1424	3.3 %	1.8 %	2.5 %
GOT	Gothenburg	658	2260	2918	13.4 %	5.3 %	7.0 %
BGY	Milan	653	116	769	11.5 %	-24.0 %	4.2 %
MCM	Monaco	646	3	649	93.4 %	--	--
BSL	Basel	634	1698	2332	1.0 %	-1.5 %	-0.8 %
BOD	Bordeaux	634	853	1488	9.4 %	-7.6 %	-1.1 %
RIX	Riga	634	1148	1782	-7.6 %	-3.2 %	-4.8 %
BLQ	Bologna	626	2024	2649	12.7 %	2.6 %	4.9 %
KBP	Kiev	615	1414	2028	-1.6 %	-11.4 %	-8.7 %
BRS	Bristol	609	812	1421	1.2 %	1.3 %	1.2 %
ADB	Izmir	609	872	1481	-5.0 %	-2.4 %	-3.5 %
FAO	Faro	602	565	1167	12.3 %	12.1 %	12.2 %
NAP	Naples	602	1025	1627	9.2 %	0.8 %	3.8 %
BEG	Belgrade	585	1420	2005	6.6 %	-1.4 %	0.8 %
KEF	Keflavik	563	927	1490	30.6 %	97.0 %	65.2 %
SVG	Stavanger	562	963	1526	-6.8 %	-36.4 %	-28.0 %
NTE	Nantes	540	670	1210	8.0 %	-2.3 %	2.0 %
HAJ	Hanover	537	2331	2868	1.5 %	-0.5 %	-0.1 %
HER	Heraklion	522	512	1034	13.3 %	27.9 %	20.1 %
BMA	Stockholm	507	146	653	29.7 %	2.6 %	22.5 %
VLC	Valencia	498	1349	1847	6.0 %	21.7 %	17.0 %
ABZ	Aberdeen	494	1488	1982	-15.9 %	-10.8 %	-12.2 %
SKG	Thessaloniki	492	635	1128	6.6 %	17.7 %	12.6 %
BOO	Bodo	489	160	649	2.2 %	4.1 %	2.6 %
LUX	Luxembourg	462	1550	2012	4.3 %	-3.2 %	-1.5 %
TOS	Tromsoe	456	236	692	-0.7 %	-9.7 %	-3.9 %
CRL	Charleroi	455	63	519	7.1 %	2.5 %	6.6 %
PMO	Palermo	453	516	969	8.7 %	14.9 %	11.9 %
TFN	Tenerife	434	410	844	3.4 %	8.2 %	5.7 %
BIO	Bilbao	431	1745	2176	-3.5 %	-5.2 %	-4.9 %

AIRPORT		CONNECTIVITY					
		Growth 2016 vs. 2008			Growth 2016 vs. 2006		
IATA code		direct	indirect	airport	direct	indirect	airport
TLV	Tel-Aviv	65.5 %	39.7 %	44.0 %	80.1 %	47.2 %	52.5 %
LIN	Milan	7.4 %	38.2 %	28.3 %	-1.9 %	88.6 %	51.1 %
ESB	Ankara	118.5 %	48.4 %	73.4 %	152.3 %	128.2 %	138.4 %
VCE	Venice	22.2 %	57.8 %	49.1 %	19.6 %	73.4 %	59.0 %
GLA	Glasgow	3.4 %	22.3 %	15.3 %	-0.6 %	3.9 %	2.4 %
ALC	Alicante	13.4 %	25.9 %	18.5 %	43.2 %	43.3 %	43.3 %
BUD	Budapest	-16.3 %	14.8 %	5.3 %	-22.8 %	18.5 %	4.9 %
LCY	London	-2.3 %	-19.3 %	-12.3 %	27.3 %	31.4 %	29.5 %
MRS	Marseille	2.7 %	24.2 %	16.5 %	7.9 %	19.2 %	15.4 %
TLS	Toulouse	5.8 %	10.5 %	9.1 %	15.6 %	22.2 %	20.2 %
BGO	Bergen	1.5 %	-1.8 %	-0.3 %	9.5 %	35.3 %	21.8 %
SXF	Berlin	36.8 %	194.0 %	71.6 %	55.4 %	272.8 %	99.5 %
LPA	Gran Canaria	-8.2 %	-3.2 %	-5.9 %	15.3 %	19.6 %	17.2 %
IBZ	Ibiza	56.4 %	165.5 %	88.1 %	111.8 %	227.4 %	147.6 %
OPO	Porto	47.9 %	60.3 %	55.8 %	68.5 %	12.2 %	27.0 %
TRD	Trondheim	9.0 %	42.9 %	24.2 %	6.1 %	47.0 %	23.8 %
GOT	Gothenburg	4.9 %	31.8 %	24.6 %	7.6 %	39.9 %	31.1 %
BGY	Milan	35.3 %	0.9 %	28.7 %	72.4 %	27.4 %	63.7 %
MCM	Monaco	-11.4 %	--	--	77.0 %	--	--
BSL	Basel	23.7 %	67.3 %	52.7 %	48.3 %	62.9 %	58.6 %
BOD	Bordeaux	20.2 %	-21.9 %	-8.2 %	42.0 %	6.3 %	19.0 %
RIX	Riga	23.4 %	95.1 %	61.6 %	86.5 %	89.7 %	88.6 %
BLQ	Bologna	26.1 %	21.1 %	22.2 %	26.9 %	23.2 %	24.0 %
KBP	Kiev	-13.0 %	-7.9 %	-9.5 %	6.2 %	7.1 %	6.8 %
BRS	Bristol	2.0 %	-13.0 %	-7.1 %	18.1 %	50.0 %	34.4 %
ADB	Izmir	82.7 %	102.7 %	94.0 %	110.1 %	205.7 %	157.5 %
FAO	Faro	42.9 %	97.2 %	64.9 %	89.7 %	181.8 %	125.4 %
NAP	Naples	-0.2 %	57.8 %	29.9 %	23.1 %	93.9 %	59.9 %
BEG	Belgrade	62.6 %	50.1 %	53.5 %	67.5 %	103.6 %	91.5 %
KEF	Keflavik	185.9 %	1103.1 %	443.9 %	278.9 %	2641.7 %	716.9 %
SVG	Stavanger	2.3 %	14.5 %	9.7 %	6.8 %	30.9 %	20.9 %
NTE	Nantes	50.3 %	4.1 %	20.6 %	84.5 %	51.7 %	64.8 %
HAJ	Hanover	-18.3 %	12.3 %	5.0 %	-18.0 %	23.7 %	12.9 %
HER	Heraklion	72.8 %	292.0 %	139.0 %	93.6 %	369.7 %	173.1 %
BMA	Stockholm	43.4 %	205.6 %	62.7 %	61.1 %	135.7 %	73.3 %
VLC	Valencia	-29.7 %	37.5 %	9.3 %	-12.8 %	67.8 %	34.3 %
ABZ	Aberdeen	-17.3 %	32.1 %	15.0 %	-14.1 %	48.5 %	25.7 %
SKG	Thessaloniki	8.2 %	50.8 %	28.7 %	15.9 %	38.2 %	27.5 %
BOO	Bodo	-1.4 %	-9.7 %	-3.6 %	3.4 %	14.3 %	5.9 %
LUX	Luxembourg	13.1 %	28.5 %	24.6 %	15.2 %	34.8 %	29.7 %
TOS	Tromsoe	6.8 %	6.3 %	6.6 %	3.0 %	15.8 %	7.1 %
CRL	Charleroi	144.6 %	595.0 %	165.5 %	206.6 %	819.7 %	233.7 %
PMO	Palermo	-4.1 %	33.0 %	12.6 %	1.7 %	58.5 %	25.7 %
TFN	Tenerife	-26.1 %	9.5 %	-12.2 %	-3.6 %	34.0 %	11.6 %
BIO	Bilbao	-18.4 %	30.9 %	16.9 %	-14.7 %	44.2 %	26.8 %

AIRPORT		CONNECTIVITY					
		Absolute 2016			Growth 2016 vs. 2015		
IATA code		direct	indirect	airport	direct	indirect	airport
LCA	Larnaca	419	872	1291	18.2 %	-0.4 %	5.0 %
SOU	Southampton	417	316	733	15.7 %	45.3 %	26.8 %
LPL	Liverpool	414	55	469	25.2 %	147.2 %	32.9 %
SOF	Sofia	414	1525	1939	34.9 %	7.8 %	12.7 %
TFS	Tenerife	410	284	695	7.4 %	17.1 %	11.1 %
ACE	Lanzarote	410	221	631	0.8 %	20.9 %	7.0 %
EMA	East Midlands	408	55	463	-3.4 %	-47.2 %	-12.1 %
NUE	Nuremberg	402	1699	2101	6.0 %	0.6 %	1.6 %
KRK	Krakow	393	1161	1554	10.2 %	23.8 %	20.0 %
MSQ	Minsk	389	737	1126	18.8 %	-5.8 %	1.5 %
MLA	Malta	389	1033	1422	-2.1 %	12.9 %	8.4 %
TRN	Turin	379	1369	1749	18.6 %	-4.2 %	-0.0 %
ADA	Adana	378	408	786	33.7 %	0.8 %	14.3 %
RHO	Rhodes	377	282	659	10.3 %	15.3 %	12.4 %
ZAG	Zagreb	376	1762	2138	3.9 %	13.5 %	11.7 %
BLL	Billund	366	1413	1779	13.4 %	10.8 %	11.3 %
VNO	Vilnius	361	632	993	-1.7 %	0.5 %	-0.3 %
TLL	Tallinn	360	1180	1539	12.9 %	-13.5 %	-8.5 %
SVX	Ekaterinburg	350	439	789	9.1 %	-6.1 %	0.1 %
OVB	Novosibirsk	349	441	789	19.2 %	-2.1 %	6.3 %
SVQ	Sevilla	348	451	798	0.6 %	-6.9 %	-3.8 %
FLR	Florence	334	1805	2139	4.6 %	4.3 %	4.4 %
OLB	Olbia	313	182	496	21.8 %	36.4 %	26.8 %
CIA	Rome	311	49	360	8.3 %	0.5 %	7.2 %
CAG	Cagliari	309	386	695	-0.9 %	11.0 %	5.4 %
MAH	Menorca	307	186	493	-7.5 %	14.2 %	-0.4 %
BJV	Bodrum	304	329	632	9.5 %	-1.7 %	3.4 %
FUE	Fuerteventura	303	130	434	2.6 %	-2.6 %	1.0 %
DLM	Mugla	285	204	489	-11.0 %	-11.7 %	-11.3 %
BRE	Bremen	285	1413	1697	7.0 %	1.1 %	2.1 %
JER	Jersey	279	72	351	1.3 %	-0.8 %	0.9 %
VRN	Verona	262	537	799	9.1 %	-27.3 %	-18.4 %
SPU	Split	259	427	686	7.9 %	1.8 %	4.0 %
AER	Sochi	254	254	508	-5.1 %	-0.3 %	-2.8 %
MMX	Malmo	243	107	351	53.4 %	64.5 %	56.6 %
CFU	Kerkyra	241	170	411	10.6 %	32.0 %	18.5 %
ORK	Cork	234	480	714	21.0 %	3.7 %	8.8 %
RTM	Rotterdam	225	136	361	20.3 %	-16.9 %	2.9 %
TZX	Trabzon	222	259	482	19.2 %	14.8 %	16.8 %
FNC	Funchal	222	329	551	20.7 %	11.3 %	14.9 %
LIL	Lille	213	47	260	15.2 %	26.8 %	17.2 %
LJU	Ljubljana	213	914	1127	1.1 %	12.5 %	10.1 %
DBV	Dubrovnik	212	407	619	4.5 %	11.2 %	8.8 %
WRO	Wroclaw	193	484	678	-0.0 %	3.1 %	2.2 %
SXB	Strasbourg	193	301	493	-11.6 %	-9.0 %	-10.0 %

AIRPORT		CONNECTIVITY					
		Growth 2016 vs. 2008			Growth 2016 vs. 2006		
IATA code		direct	indirect	airport	direct	indirect	airport
LCA	Larnaca	8.1 %	34.2 %	24.4 %	24.1 %	57.5 %	44.9 %
SOU	Southampton	-13.1 %	10.7 %	-4.2 %	-14.6 %	19.9 %	-2.5 %
LPL	Liverpool	--	--	--	--	--	--
SOF	Sofia	5.4 %	33.2 %	26.1 %	40.2 %	67.5 %	60.8 %
TFS	Tenerife	45.3 %	27.0 %	37.2 %	68.5 %	47.0 %	59.0 %
ACE	Lanzarote	26.8 %	64.3 %	37.8 %	60.7 %	74.6 %	65.3 %
EMA	East Midlands	-4.5 %	130.3 %	2.7 %	34.8 %	247.3 %	45.4 %
NUE	Nuremberg	-15.0 %	10.1 %	4.2 %	-12.0 %	16.7 %	9.8 %
KRK	Krakow	19.8 %	61.0 %	48.1 %	34.9 %	94.9 %	75.2 %
MSQ	Minsk	192.8 %	146.9 %	161.1 %	341.0 %	209.1 %	244.7 %
MLA	Malta	34.8 %	193.1 %	121.9 %	50.4 %	328.1 %	184.5 %
TRN	Turin	-21.1 %	1.4 %	-4.5 %	-11.9 %	11.2 %	5.2 %
ADA	Adana	219.1 %	207.6 %	213.1 %	186.7 %	258.0 %	219.8 %
RHO	Rhodes	50.7 %	113.0 %	72.3 %	77.5 %	116.4 %	92.3 %
ZAG	Zagreb	11.0 %	43.9 %	36.8 %	22.6 %	59.1 %	51.2 %
BLL	Billund	14.5 %	62.8 %	49.8 %	36.2 %	109.6 %	88.7 %
VNO	Vilnius	5.7 %	-1.7 %	0.9 %	44.8 %	14.9 %	24.2 %
TLL	Tallinn	10.4 %	53.6 %	40.8 %	40.1 %	83.3 %	71.0 %
SVX	Ekaterinburg	43.2 %	34.4 %	38.2 %	72.6 %	43.2 %	54.9 %
OVB	Novosibirsk	53.2 %	111.7 %	81.2 %	75.5 %	207.6 %	130.9 %
SVQ	Sevilla	-25.3 %	-2.3 %	-13.8 %	-7.2 %	9.3 %	1.4 %
FLR	Florence	5.7 %	29.5 %	25.1 %	18.3 %	54.3 %	47.3 %
OLB	Olbia	38.2 %	595.2 %	95.9 %	24.5 %	465.4 %	74.6 %
CIA	Rome	-5.7 %	-2.4 %	-5.3 %	-10.9 %	2.2 %	-9.3 %
CAG	Cagliari	-5.9 %	70.0 %	25.1 %	15.6 %	871.3 %	126.4 %
MAH	Menorca	29.1 %	60.1 %	39.3 %	51.2 %	146.9 %	77.1 %
BJV	Bodrum	177.9 %	312.9 %	234.8 %	236.4 %	514.8 %	339.9 %
FUE	Fuerteventura	-3.1 %	7.6 %	-0.1 %	15.5 %	36.8 %	21.1 %
DLM	Mugla	165.4 %	251.8 %	195.7 %	237.7 %	365.6 %	281.4 %
BRE	Bremen	-8.0 %	9.9 %	6.4 %	15.3 %	30.1 %	27.4 %
JER	Jersey	-39.6 %	13.3 %	-33.2 %	-3.4 %	4.3 %	-1.9 %
VRN	Verona	-21.0 %	-37.8 %	-33.2 %	1.8 %	-20.1 %	-14.0 %
SPU	Split	91.6 %	108.3 %	101.6 %	137.1 %	203.7 %	174.5 %
AER	Sochi	--	--	--	--	--	--
MMX	Malmo	27.2 %	87.9 %	41.2 %	26.5 %	71.2 %	37.5 %
CFU	Kerkyra	93.1 %	220.4 %	131.1 %	174.4 %	384.8 %	234.6 %
ORK	Cork	-20.1 %	20.2 %	3.1 %	-7.4 %	21.3 %	10.1 %
RTM	Rotterdam	71.0 %	1994.2 %	161.8 %	59.4 %	3115.1 %	148.6 %
TZX	Trabzon	223.4 %	322.8 %	270.3 %	201.2 %	351.1 %	266.8 %
FNC	Funchal	15.5 %	40.7 %	29.3 %	-3.5 %	64.2 %	28.0 %
LIL	Lille	36.0 %	-27.3 %	17.3 %	48.3 %	-51.9 %	7.5 %
LJU	Ljubljana	-31.5 %	-2.1 %	-9.5 %	-13.8 %	19.2 %	11.2 %
DBV	Dubrovnik	86.0 %	88.9 %	87.9 %	110.6 %	155.7 %	138.2 %
WRO	Wroclaw	5.2 %	25.6 %	19.0 %	94.8 %	162.4 %	138.7 %
SXB	Strasbourg	-41.7 %	-45.7 %	-44.2 %	-48.9 %	-47.5 %	-48.0 %

AIRPORT		CONNECTIVITY					
		Absolute 2016			Growth 2016 vs. 2015		
IATA code		direct	indirect	airport	direct	indirect	airport
TBS	Tbilisi	191	535	726	12.5 %	-11.2 %	-6.0 %
EIN	Eindhoven	190	21	211	-31.3 %	-18.5 %	-30.2 %
SCQ	Santiago de Compostela	187	251	438	8.7 %	13.6 %	11.4 %
KIV	Chisinau	187	469	656	-2.4 %	5.1 %	2.9 %
TIA	Tirana	183	565	748	2.7 %	11.4 %	9.1 %
IOM	Isle Of Man	180	73	253	2.0 %	10.3 %	4.2 %
CHQ	Chania	176	156	331	10.4 %	-1.7 %	4.4 %
WMI	Warsaw	173	51	224	5.6 %	2.2 %	4.8 %
KGS	Kos	173	173	346	-6.1 %	21.4 %	5.9 %
JTR	Santorini/Thira	170	179	349	14.0 %	-2.2 %	5.1 %
ROV	Rostov	164	216	380	--	--	--
AJA	Ajaccio	164	35	199	3.5 %	-21.9 %	-2.1 %
TSF	Treviso	160	17	177	28.8 %	3.3 %	25.9 %
KTW	Katowice	158	275	433	2.7 %	-8.9 %	-5.0 %
VVO	Vladivostok	157	282	440	10.5 %	7.1 %	8.3 %
PDL	Ponta Delgada	157	94	251	-0.9 %	17.8 %	5.4 %
KUF	Samara	157	263	420	-11.9 %	-24.3 %	-20.1 %
GRZ	Graz	154	883	1037	-5.5 %	-0.5 %	-1.3 %
KRS	Kristiansand	153	384	537	-8.3 %	-6.6 %	-7.1 %
SNN	Shannon	149	626	775	4.2 %	-8.2 %	-6.0 %
NYO	Stockholm	149	50	198	--	--	--
CLJ	Cluj	148	186	333	174.0 %	32.8 %	72.1 %
TJM	Tyumen	147	231	378	--	--	--
SZG	Salzburg	147	664	811	-14.9 %	-7.1 %	-8.6 %
KZN	Kazan	144	273	416	17.5 %	-6.7 %	0.4 %
UME	Umeå	143	197	340	16.5 %	100.5 %	53.8 %
GZT	Gaziantep	142	231	373	-4.2 %	28.0 %	13.5 %
MRV	Mineralnye Vody	140	149	289	-6.7 %	-26.2 %	-17.9 %
BOJ	Bourgas	137	110	247	-3.8 %	9.0 %	1.5 %
SKP	Skopje	137	306	443	78.9 %	3.8 %	19.3 %
JMK	Mikonos	135	162	297	8.2 %	0.9 %	4.1 %
ASR	Kayseri	135	262	397	-0.2 %	-8.5 %	-5.9 %
INV	Inverness	134	185	320	14.7 %	136.5 %	63.5 %
HFT	Hammerfest	134	3	138	-2.9 %	-10.4 %	-3.1 %
RNS	Rennes	133	337	469	24.0 %	2.0 %	7.4 %
KGD	Kaliningrad	129	277	406	-6.4 %	-12.2 %	-10.4 %
SPC	La Palma	129	46	174	21.6 %	-1.7 %	14.5 %
BIQ	Biarritz	128	247	375	9.6 %	422.3 %	128.8 %
POZ	Poznan	126	471	597	-6.1 %	2.0 %	0.2 %
AES	Aalesund	126	323	448	0.4 %	-12.9 %	-9.6 %
VAR	Varna	126	124	249	44.0 %	-13.2 %	8.5 %
DIY	Diyarbakir	125	121	245	27.3 %	-18.7 %	-0.4 %
PFO	Paphos	124	88	212	-17.3 %	-19.6 %	-18.3 %
TIV	Tivat	124	191	315	11.9 %	65.6 %	39.2 %
BES	Brest	124	227	351	1.6 %	-7.9 %	-4.8 %

AIRPORT		CONNECTIVITY					
		Growth 2016 vs. 2008			Growth 2016 vs. 2006		
IATA code		direct	indirect	airport	direct	indirect	airport
TBS	Tbilisi	47.8 %	97.7 %	81.6 %	150.4 %	183.0 %	173.6 %
EIN	Eindhoven	57.2 %	202.3 %	65.1 %	154.8 %	-87.4 %	-12.3 %
SCQ	Santiago de Compostela	8.3 %	-5.5 %	-0.1 %	-1.4 %	11.8 %	5.7 %
KIV	Chisinau	61.0 %	208.9 %	144.8 %	114.1 %	215.8 %	178.1 %
TIA	Tirana	0.1 %	62.9 %	41.3 %	12.7 %	233.5 %	125.5 %
IOM	Isle Of Man	-29.8 %	122.4 %	-12.5 %	-28.7 %	35.0 %	-17.5 %
CHQ	Chania	83.8 %	84.8 %	84.3 %	91.5 %	53.4 %	71.5 %
WMI	Warsaw	--	--	--	--	--	--
KGS	Kos	72.9 %	216.1 %	123.6 %	120.2 %	194.3 %	151.9 %
JTR	Santorini/Thira	125.4 %	182.8 %	151.6 %	142.6 %	189.6 %	164.7 %
ROV	Rostov	--	--	--	--	--	--
AJA	Ajaccio	49.3 %	-38.7 %	19.3 %	63.3 %	-49.0 %	17.9 %
TSF	Treviso	25.2 %	-44.7 %	11.8 %	82.0 %	-30.7 %	57.8 %
KTW	Katowice	-14.4 %	-7.6 %	-10.2 %	15.4 %	-18.6 %	-8.8 %
VVO	Vladivostok	36.7 %	234.8 %	120.4 %	46.1 %	295.5 %	145.5 %
PDL	Ponta Delgada	15.1 %	19.1 %	16.5 %	25.1 %	111.1 %	47.7 %
KUF	Samara	-27.1 %	-4.0 %	-14.2 %	-24.6 %	9.6 %	-6.3 %
GRZ	Graz	-21.4 %	13.5 %	6.5 %	-1.3 %	8.2 %	6.6 %
KRS	Kristiansand	-8.4 %	16.7 %	8.2 %	8.7 %	33.3 %	25.2 %
SNN	Shannon	-37.3 %	2.9 %	-8.4 %	-38.3 %	-37.0 %	-37.2 %
NYO	Stockholm	--	--	--	--	--	--
CLJ	Cluj	42.0 %	18.6 %	27.9 %	98.2 %	87.6 %	92.1 %
TJM	Tyumen	--	--	--	--	--	--
SZG	Salzburg	-9.7 %	0.5 %	-1.5 %	1.0 %	15.7 %	12.7 %
KZN	Kazan	74.8 %	310.5 %	180.2 %	81.0 %	440.5 %	220.8 %
UME	Umeå	11.6 %	214.9 %	78.2 %	40.0 %	159.4 %	90.8 %
GZT	Gaziantep	196.8 %	171.9 %	180.9 %	627.0 %	1033.8 %	834.4 %
MRV	Mineralnye Vody	60.4 %	270.7 %	126.7 %	80.1 %	404.1 %	169.4 %
BOJ	Bourgas	146.2 %	156.0 %	150.5 %	377.7 %	468.0 %	414.1 %
SKP	Skopje	46.9 %	78.1 %	67.1 %	53.1 %	-1.5 %	10.7 %
JMK	Mikonos	110.8 %	301.5 %	184.7 %	129.5 %	365.8 %	217.6 %
ASR	Kayseri	313.9 %	251.5 %	270.4 %	264.1 %	310.7 %	293.6 %
INV	Inverness	-10.8 %	365.4 %	67.8 %	-13.4 %	232.2 %	51.5 %
HFT	Hammerfest	6.4 %	488.5 %	8.6 %	0.6 %	--	--
RNS	Rennes	7.7 %	47.5 %	33.6 %	-4.3 %	50.4 %	29.5 %
KGD	Kaliningrad	-51.9 %	276.5 %	18.8 %	5.4 %	291.2 %	110.1 %
SPC	La Palma	-15.8 %	20.3 %	-8.6 %	-16.7 %	60.3 %	-4.7 %
BIQ	Biarritz	5.9 %	205.1 %	86.0 %	29.2 %	4.8 %	12.0 %
POZ	Poznan	-21.7 %	36.8 %	18.1 %	21.3 %	99.2 %	75.3 %
AES	Aalesund	18.6 %	124.1 %	79.4 %	22.2 %	307.9 %	146.4 %
VAR	Varna	46.9 %	11.9 %	27.2 %	118.2 %	22.0 %	56.9 %
DIY	Diyarbakir	212.7 %	346.4 %	266.7 %	190.5 %	458.2 %	280.1 %
PFO	Paphos	26.1 %	48.5 %	34.5 %	127.8 %	60.0 %	93.8 %
TIV	Tivat	99.4 %	883.1 %	285.4 %	141.5 %	3459.8 %	454.2 %
BES	Brest	-3.3 %	-8.4 %	-6.6 %	10.2 %	6.0 %	7.4 %

AIRPORT		CONNECTIVITY					
		Absolute 2016			Growth 2016 vs. 2015		
IATA code		direct	indirect	airport	direct	indirect	airport
GRO	Girona	123	61	184	-16.2 %	-17.5 %	-16.6 %
VDS	Vadso	121	1	122	0.0 %	206.0 %	0.5 %
PRN	Pristina	119	524	643	38.2 %	6.9 %	11.6 %
BTS	Bratislava	117	48	166	21.4 %	10.6 %	18.0 %
SZF	Samsun	115	142	258	6.1 %	2.7 %	4.2 %
OVD	Asturias	115	286	401	15.7 %	23.6 %	21.2 %
LLA	Luleå	115	140	254	3.6 %	37.8 %	19.9 %
FMO	Muenster	113	574	687	2.5 %	-7.7 %	-6.2 %
TPS	Trapani	113	12	124	-8.1 %	-4.9 %	-7.8 %
FDH	Friedrichshafen	110	285	395	22.2 %	-16.0 %	-8.0 %
BRN	Bern	106	56	162	6.8 %	-10.5 %	0.1 %
TGD	Podgorica	100	315	415	1.0 %	29.5 %	21.2 %
ALF	Alta	100	71	171	-5.8 %	-7.6 %	-6.6 %
ZTH	Zakynthos Island	98	116	214	-9.5 %	39.5 %	11.8 %
LEI	Almería	97	173	270	29.0 %	83.2 %	59.2 %
KKN	Kirkenes	97	46	143	-0.2 %	-2.9 %	-1.1 %
OUL	Oulunsalo	96	310	406	14.0 %	6.0 %	7.8 %
LCG	A Coruna	96	296	391	0.8 %	3.2 %	2.6 %
VBY	Visby	94	86	180	7.0 %	88.2 %	34.7 %
ODS	Odessa	92	296	388	-8.5 %	-15.5 %	-13.9 %
GOJ	Nizhniy Novgorod	91	223	314	2.1 %	-14.4 %	-10.1 %
HTY	Antakya	91	140	230	11.9 %	-24.2 %	-13.2 %
XRY	Jerez	89	189	278	11.6 %	5.3 %	7.3 %
MJV	Murcia	89	39	127	-11.9 %	-5.9 %	-10.1 %
TSR	Timisoara	88	192	281	97.8 %	7.1 %	25.2 %
SJJ	Sarajevo	87	445	533	-1.1 %	8.5 %	6.8 %
PUF	Pau	87	243	330	-5.6 %	-10.1 %	-8.9 %
IAS	Iasi	87	111	198	99.4 %	21.8 %	46.9 %
NQY	Newquay	85	51	137	17.7 %	39.1 %	24.9 %
SDR	Santander	85	201	285	-7.6 %	8.9 %	3.4 %
BNN	Bronnoysund	84	1	85	-3.4 %	-28.3 %	-3.7 %
VGO	Vigo	83	226	309	10.7 %	-12.1 %	-7.0 %
OSD	Ostersund	81	136	217	52.8 %	74.5 %	65.7 %
KYA	Konya	81	168	249	-4.0 %	-23.2 %	-17.9 %
CEK	Chelyabinsk	79	239	318	-16.8 %	0.7 %	-4.3 %
TRS	Trieste	79	276	355	-5.2 %	-4.2 %	-4.5 %
MJF	Mosjoen	78	1	79	0.0 %	584.9 %	0.8 %
SSJ	Sandnessjoen	78	1	79	0.0 %	393.5 %	1.0 %
MMK	Murmansk	78	193	271	--	--	--
MQN	Mo i Rana	77	1	77	0.0 %	-11.4 %	-0.1 %
EVE	Harstad	76	115	191	0.0 %	-3.3 %	-2.0 %
MOL	Molde	76	75	151	-3.5 %	-10.0 %	-6.8 %
MLN	Melilla	74	118	191	-6.3 %	15.4 %	5.9 %
NOC	Knock	73	45	118	22.4 %	36.9 %	27.6 %
AGH	Angelholm	73	65	138	--	--	--

AIRPORT		CONNECTIVITY					
		Growth 2016 vs. 2008			Growth 2016 vs. 2006		
IATA code		direct	indirect	airport	direct	indirect	airport
GRO	Girona	-69.3 %	11.6 %	-59.7 %	-40.5 %	214.4 %	-18.8 %
VDS	Vadso	13.5 %	--	--	13.4 %	--	--
PRN	Pristina	--	--	--	--	--	--
BTS	Bratislava	-38.7 %	-72.2 %	-54.7 %	-44.6 %	-73.1 %	-57.7 %
SZF	Samsun	306.5 %	142.1 %	195.6 %	312.4 %	191.2 %	235.3 %
OVD	Asturias	-31.8 %	15.8 %	-3.5 %	-24.2 %	48.5 %	16.5 %
LLA	Luleå	-17.4 %	12.4 %	-3.4 %	3.8 %	22.6 %	13.3 %
FMO	Muenster	-43.7 %	1.8 %	-10.1 %	-42.4 %	-0.1 %	-10.9 %
TPS	Trapani	48.3 %	-33.5 %	33.0 %	114.4 %	-55.2 %	58.5 %
FDH	Friedrichshafen	-16.5 %	28.6 %	11.8 %	15.5 %	22.8 %	20.7 %
BRN	Bern	277.8 %	-56.9 %	2.5 %	214.4 %	15.2 %	96.8 %
TGD	Podgorica	32.3 %	407.6 %	201.1 %	78.2 %	1200.2 %	415.6 %
ALF	Alta	1.9 %	49.2 %	17.4 %	14.0 %	33.8 %	21.5 %
ZTH	Zakynthos Island	124.2 %	726.0 %	270.2 %	249.2 %	693.3 %	401.1 %
LEI	Almería	-18.8 %	-39.6 %	-33.5 %	-11.6 %	7.7 %	-0.1 %
KKN	Kirkenes	-17.4 %	-5.4 %	-13.8 %	-12.8 %	24.1 %	-3.5 %
OUL	Oulunsalo	-0.3 %	-9.3 %	-7.3 %	-22.2 %	5.4 %	-2.8 %
LCG	A Coruna	-17.7 %	-8.0 %	-10.6 %	-19.7 %	-13.5 %	-15.1 %
VBY	Visby	20.5 %	257.0 %	76.1 %	-12.2 %	182.6 %	30.8 %
ODS	Odessa	-25.4 %	34.5 %	13.0 %	-16.8 %	44.8 %	23.1 %
GOJ	Nizhniy Novgorod	77.2 %	163.5 %	130.8 %	117.5 %	141.4 %	134.0 %
HTY	Antakya	724.2 %	406.9 %	497.4 %	--	--	--
XRY	Jerez	-17.3 %	-22.3 %	-20.8 %	-23.5 %	20.5 %	1.8 %
MJV	Murcia	-49.0 %	-76.2 %	-62.1 %	-37.5 %	-65.1 %	-49.6 %
TSR	Timisoara	-58.1 %	-15.8 %	-36.1 %	-60.6 %	-11.5 %	-36.4 %
SJJ	Sarajevo	-17.5 %	61.1 %	39.3 %	6.1 %	55.2 %	44.2 %
PUF	Pau	-19.1 %	-30.1 %	-27.5 %	1.6 %	-19.5 %	-14.8 %
IAS	Iasi	172.1 %	145.2 %	156.3 %	278.3 %	172.8 %	210.8 %
NQY	Newquay	--	--	--	--	--	--
SDR	Santander	-40.9 %	-12.5 %	-23.4 %	-5.5 %	52.3 %	28.9 %
BNN	Bronnoysund	3.0 %	33.9 %	3.2 %	3.6 %	-43.1 %	2.8 %
VGO	Vigo	-40.3 %	-54.8 %	-51.6 %	-40.3 %	-48.9 %	-46.8 %
OSD	Ostersund	10.8 %	283.2 %	99.8 %	102.5 %	308.1 %	195.9 %
KYA	Konya	238.0 %	516.9 %	386.3 %	286.2 %	1803.3 %	735.4 %
CEK	Chelyabinsk	-5.7 %	141.7 %	74.1 %	28.7 %	312.4 %	166.4 %
TRS	Trieste	-45.1 %	-38.6 %	-40.2 %	-32.3 %	4.6 %	-6.7 %
MJF	Mosjoen	13.3 %	-25.2 %	12.7 %	14.7 %	-18.3 %	14.3 %
SSJ	Sandnessjoen	-2.7 %	184.7 %	-1.9 %	-2.3 %	66.2 %	-1.8 %
MMK	Murmansk	--	--	--	--	--	--
MQN	Mo i Rana	-3.1 %	-35.0 %	-3.5 %	-2.7 %	-76.2 %	-5.4 %
EVE	Harstad	13.8 %	5.5 %	8.6 %	-2.2 %	48.3 %	23.0 %
MOL	Molde	22.5 %	85.8 %	47.4 %	8.5 %	50.4 %	25.9 %
MLN	Melilla	13.4 %	30.7 %	23.4 %	-10.4 %	86.6 %	31.6 %
NOC	Knock	41.3 %	83.5 %	54.9 %	33.2 %	75.2 %	46.6 %
AGH	Angelholm	--	--	--	--	--	--

AIRPORT		CONNECTIVITY					
		Absolute 2016			Growth 2016 vs. 2015		
IATA code		direct	indirect	airport	direct	indirect	airport
CFE	Clermont-Ferrand	72	355	427	-4.9 %	-11.9 %	-10.8 %
VAN	Van	71	82	153	8.6 %	-26.6 %	-13.5 %
GRX	Granada	71	181	252	0.0 %	-1.3 %	-1.0 %
INN	Innsbruck	71	557	627	-7.5 %	-3.5 %	-3.9 %
TKU	Turku	70	212	282	18.6 %	10.4 %	12.3 %
EDO	Balikesir	69	31	101	192.7 %	58.2 %	131.6 %
ERZ	Erzurum	68	89	158	27.5 %	-4.7 %	7.0 %
ZAD	Zadar	68	36	104	-2.2 %	-2.7 %	-2.3 %
FRO	Floro	68	5	73	-7.2 %	-27.1 %	-8.8 %
LNZ	Linz	68	372	440	-6.6 %	-8.3 %	-8.0 %
PEE	Perm	67	203	270	--	--	--
KSU	Kristiansund	65	50	115	-8.7 %	-21.4 %	-14.6 %
SKN	Stokmarknes	65	7	72	0.0 %	71.4 %	4.3 %
HAU	Haugesund	64	97	161	-11.1 %	-21.8 %	-17.9 %
EZS	Elazığ	64	56	120	3.0 %	-37.1 %	-20.7 %
REU	Reus	63	9	72	-8.6 %	-28.1 %	-11.6 %
FMM	Memmingerberg	62	5	67	-0.4 %	-25.5 %	-2.9 %
SDL	Sundsvall	62	100	161	--	--	--
MJT	Mytilene	60	66	126	6.6 %	-7.6 %	-1.3 %
SOG	Sogndal	60	2	62	-0.2 %	-13.1 %	-0.6 %
ETH	Eilath	60	0	60	-25.0 %	-94.1 %	-25.7 %
VAA	Vaasa	59	215	274	13.5 %	11.2 %	11.7 %
GZP	Gazipasa	59	125	183	0.3 %	-22.2 %	-16.2 %
PUY	Pula	58	40	98	1.9 %	-10.4 %	-3.5 %
ANR	Antwerp	58	2	59	29.0 %	-50.7 %	23.3 %
BRQ	Brno	57	34	91	19.4 %	1612.4 %	82.6 %
SMI	Samos	57	40	97	22.4 %	-8.7 %	7.4 %
MEH	Mehamn	56	--	56	0.0 %	--	--
TLN	Toulon	55	28	83	-4.3 %	5.7 %	-1.2 %
KLR	Kalmar	55	41	96	--	--	--
BJF	Batsfjord	54	--	54	0.0 %	--	--
GNY	Sanliurfa	53	69	122	68.2 %	13.6 %	32.3 %
TMP	Tampere	53	190	243	-11.6 %	0.6 %	-2.3 %
LKN	Leknes	53	1	54	0.0 %	-78.5 %	-5.9 %
HVG	Honningsvag	52	3	55	0.0 %	0.0 %	0.0 %
MLX	Malatya	51	72	123	33.6 %	-32.1 %	-14.9 %
LIG	Limoges	50	9	59	8.2 %	-1.6 %	6.6 %
EAS	San Sebastian	49	184	233	11.4 %	31.2 %	26.5 %
LRH	La Rochelle	49	16	65	4.6 %	-10.9 %	0.3 %
VAS	Sivas	49	61	109	35.3 %	-52.7 %	-33.5 %
RNB	Ronneby	48	48	96	45.5 %	57.3 %	51.1 %
VOG	Volgograd	48	138	186	-23.3 %	5.1 %	-4.1 %
OSR	Ostrava	48	27	75	2.2 %	11.7 %	5.5 %
EFL	Kefallinia	48	44	92	-11.0 %	-1.2 %	-6.6 %
JKG	Jönköping	47	125	172	--	--	--

AIRPORT		CONNECTIVITY					
		Growth 2016 vs. 2008			Growth 2016 vs. 2006		
IATA code		direct	indirect	airport	direct	indirect	airport
CFE	Clermont-Ferrand	-64.2 %	4.6 %	-20.9 %	-66.6 %	24.3 %	-14.7 %
VAN	Van	145.7 %	88.5 %	111.4 %	209.7 %	269.2 %	238.9 %
GRX	Granada	-43.6 %	-24.1 %	-30.8 %	-18.4 %	-17.1 %	-17.5 %
INN	Innsbruck	-39.1 %	2.3 %	-5.0 %	-27.7 %	3.9 %	-1.0 %
TKU	Turku	3.0 %	-20.0 %	-15.3 %	-17.6 %	-34.3 %	-30.8 %
EDO	Balikesir	3368.2 %	--	--	3368.2 %	--	--
ERZ	Erzurum	101.8 %	245.1 %	163.8 %	198.1 %	1010.4 %	409.0 %
ZAD	Zadar	118.7 %	2290.3 %	217.8 %	333.6 %	525.7 %	384.6 %
FRO	Floro	27.0 %	--	--	29.4 %	--	--
LNZ	Linz	-50.6 %	-47.1 %	-47.6 %	-33.0 %	-32.2 %	-32.4 %
PEE	Perm	--	--	--	--	--	--
KSU	Kristiansund	-1.1 %	-10.5 %	-5.4 %	-24.6 %	-14.9 %	-20.7 %
SKN	Stokmarknes	6.1 %	318.4 %	14.5 %	30.1 %	139.6 %	36.3 %
HAU	Haugesund	-19.0 %	-6.0 %	-11.6 %	-19.0 %	33.5 %	6.2 %
EZS	Elazığ	354.1 %	651.2 %	457.6 %	606.4 %	1212.5 %	801.8 %
REU	Reus	8.6 %	-59.6 %	-10.0 %	13.6 %	-89.4 %	-48.2 %
FMM	Memmingerberg	32.0 %	85.5 %	35.0 %	--	--	--
SDL	Sundsvall	--	--	--	--	--	--
MJT	Mytilene	-14.4 %	69.5 %	15.3 %	-20.1 %	83.9 %	13.2 %
SOG	Sogndal	-2.9 %	14.2 %	-2.4 %	-3.1 %	-17.5 %	-3.6 %
ETH	Eilath	-46.8 %	-98.6 %	-48.3 %	-47.9 %	-99.0 %	-49.8 %
VAA	Vaasa	-27.2 %	-2.9 %	-9.4 %	-31.4 %	20.0 %	3.4 %
GZP	Gazipasa	--	--	--	--	--	--
PUY	Pula	84.8 %	2212.1 %	196.3 %	205.7 %	746.1 %	313.9 %
ANR	Antwerp	68.2 %	-45.6 %	58.8 %	106.2 %	-78.7 %	65.5 %
BRQ	Brno	61.9 %	-7.7 %	26.4 %	94.1 %	33.5 %	66.0 %
SMI	Samos	-9.3 %	-30.7 %	-19.5 %	-10.9 %	-15.6 %	-12.9 %
MEH	Mehamn	-1.3 %	--	--	-0.2 %	--	--
TLN	Toulon	-15.2 %	-9.1 %	-13.2 %	-3.0 %	1.2 %	-1.7 %
KLR	Kalmar	--	--	--	--	--	--
BJF	Batsfjord	6.2 %	--	--	7.4 %	--	--
GNY	Sanliurfa	281.7 %	556.1 %	399.4 %	--	--	--
TMP	Tampere	-52.7 %	-50.9 %	-51.3 %	-47.0 %	-26.6 %	-32.3 %
LKN	Leknes	9.9 %	627.8 %	11.5 %	9.7 %	1095.9 %	11.4 %
HVG	Honningsvag	6.7 %	--	--	2.9 %	--	--
MLX	Malatya	110.7 %	374.4 %	213.0 %	80.5 %	594.7 %	219.6 %
LIG	Limoges	-29.4 %	-91.3 %	-65.6 %	-24.4 %	-92.2 %	-66.8 %
EAS	San Sebastian	-28.2 %	-2.6 %	-9.4 %	-39.8 %	31.2 %	5.1 %
LRH	La Rochelle	-5.2 %	31.8 %	1.8 %	24.2 %	66.2 %	32.4 %
VAS	Sivas	341.5 %	111.0 %	174.8 %	--	--	--
RNB	Ronneby	-4.0 %	177.9 %	42.4 %	92.0 %	399.3 %	176.9 %
VOG	Volgograd	11.1 %	132.0 %	81.3 %	4.4 %	109.2 %	66.3 %
OSR	Ostrava	14.1 %	-64.1 %	-36.3 %	1.2 %	-80.1 %	-59.2 %
EFL	Kefallinia	49.9 %	102.2 %	71.1 %	104.1 %	76.0 %	89.6 %
JKG	Jönköping	--	--	--	--	--	--

AIRPORT		CONNECTIVITY					
		Absolute 2016			Growth 2016 vs. 2015		
IATA code		direct	indirect	airport	direct	indirect	airport
PGF	Perpignan	47	26	73	-17.8 %	15.6 %	-8.3 %
HOV	Orsta	46	2	48	-20.1 %	-42.9 %	-21.3 %
KUO	Kuopio	46	260	306	24.3 %	14.3 %	15.7 %
SBZ	Sibiu	46	164	209	27.3 %	20.5 %	22.0 %
VAW	Vardo	46	--	46	0.0 %	--	--
JSI	Skiathos	46	60	106	60.9 %	36.4 %	46.0 %
KUN	Kaunas	45	7	53	-2.1 %	-69.9 %	-25.0 %
DNZ	Çardak	45	110	156	10.8 %	-21.6 %	-14.3 %
KSD	Karlstad	44	97	141	--	--	--
AOK	Karpathos	44	45	89	-5.0 %	-5.5 %	-5.3 %
PVK	Preveza/Lefkas	43	40	83	21.9 %	77.5 %	43.8 %
SVJ	Svolvaer	43	4	46	0.0 %	-39.0 %	-4.9 %
FDE	Forde	41	3	44	-2.4 %	47.9 %	-0.1 %
NAV	Nevsehir/Kapadokya	41	108	149	41.4 %	-14.1 %	-3.8 %
BUS	Batumi	41	65	106	100.1 %	17.8 %	40.1 %
OSY	Namsos	41	0	41	0.0 %	--	--
JKH	Chios	40	66	105	20.4 %	15.3 %	17.1 %
KVA	Kavala	40	23	63	29.7 %	-17.9 %	6.9 %
RVK	Rorvik	40	--	40	0.0 %	--	--
MQM	Mardin	40	88	127	32.6 %	288.1 %	142.7 %
HTA	Chita	39	99	138	1.2 %	-27.7 %	-21.3 %
SDV	Tel-Aviv	39	--	39	-35.9 %	--	--
HOR	Horta	39	18	57	-5.1 %	-43.5 %	-21.9 %
KLU	Klagenfurt	38	232	270	-0.0 %	0.2 %	0.1 %
SDN	Sandane	38	0	38	3.3 %	-71.7 %	2.8 %
HAD	Halmstad	38	33	71	--	--	--
HRK	Kharkiv	37	76	114	14.1 %	-38.2 %	-27.3 %
BCM	Bacău	36	--	36	19.2 %	--	--
BAL	Batman	35	74	109	89.6 %	-27.3 %	-9.1 %
PLQ	Palanga	35	78	113	69.0 %	122.0 %	102.2 %
ANX	Andoya	35	10	45	0.0 %	-22.1 %	-5.9 %
ASF	Astrakhan	35	140	175	-28.0 %	-13.8 %	-17.0 %
BOH	Bournemouth	35	1	35	-63.6 %	-99.1 %	-78.6 %
BVG	Berlevag	34	--	34	0.0 %	--	--
ORB	Orebro	34	39	73	--	--	--
KIR	Kerry	34	52	86	-0.1 %	94.0 %	41.6 %
CFR	Caen	34	20	53	23.3 %	-27.2 %	-1.7 %
OST	Ostend	33	1	35	67.6 %	0.0 %	63.5 %
SFT	Skellefteå	32	65	97	--	--	--
RVN	Rovaniemi	32	183	215	6.7 %	4.6 %	4.9 %
LDE	Lourdes	32	17	49	14.0 %	-31.9 %	-8.0 %
SOJ	Sorkjosen	32	2	33	0.0 %	0.0 %	0.0 %
JOE	Joensuu	30	88	118	30.4 %	-0.5 %	5.9 %
KLX	Kalamata	30	41	70	35.4 %	50.5 %	43.8 %
PNA	Pamplona	29	127	156	0.0 %	28.7 %	22.2 %

AIRPORT		CONNECTIVITY					
		Growth 2016 vs. 2008			Growth 2016 vs. 2006		
IATA code		direct	indirect	airport	direct	indirect	airport
PGF	Perpignan	-4.0 %	23.5 %	4.4 %	-3.8 %	37.6 %	7.9 %
HOV	Orsta	-1.9 %	92.5 %	-0.1 %	32.0 %	--	--
KUO	Kuopio	-27.8 %	3.1 %	-3.1 %	-30.3 %	43.0 %	23.5 %
SBZ	Sibiu	0.1 %	90.4 %	59.1 %	51.9 %	782.5 %	330.2 %
VAW	Vardo	10.6 %	--	--	10.5 %	--	--
JSI	Skiathos	262.2 %	1111.9 %	502.4 %	437.7 %	2025.4 %	834.9 %
KUN	Kaunas	69.8 %	-23.5 %	45.6 %	134.9 %	19.6 %	107.6 %
DNZ	Çardak	229.0 %	214.2 %	218.4 %	229.0 %	344.1 %	303.1 %
KSD	Karlstad	--	--	--	--	--	--
AOK	Karpathos	2.5 %	196.8 %	54.0 %	22.9 %	841.3 %	120.9 %
PVK	Preveza/Lefkas	98.4 %	2642.2 %	261.2 %	152.7 %	20827.4 %	386.0 %
SVJ	Svolvaer	-9.2 %	547.5 %	-2.4 %	-8.6 %	--	--
FDE	Forde	2.5 %	1390.4 %	9.2 %	10.8 %	--	--
NAV	Nevsehir/Kapadokya	923.0 %	1211.0 %	1117.1 %	--	--	--
BUS	Batumi	247.2 %	209.2 %	222.8 %	1939.4 %	--	--
OSY	Namsos	4.6 %	--	--	4.8 %	--	--
JKH	Chios	-5.9 %	118.0 %	45.5 %	-15.6 %	87.7 %	28.3 %
KVA	Kavala	33.5 %	-14.7 %	10.5 %	31.8 %	-2.9 %	16.4 %
RVK	Rorvik	44.7 %	--	--	45.0 %	--	--
MQM	Mardin	301.2 %	587.8 %	462.9 %	1217.1 %	87411.1 %	4003.1 %
HTA	Chita	178.3 %	1425.0 %	569.4 %	160.2 %	2626.6 %	636.0 %
SDV	Tel-Aviv	-52.3 %	--	--	-50.5 %	--	--
HOR	Horta	-37.6 %	-25.6 %	-34.2 %	-29.0 %	30.9 %	-17.0 %
KLU	Klagenfurt	-49.7 %	-26.4 %	-30.9 %	-36.1 %	-40.3 %	-39.8 %
SDN	Sandane	0.4 %	--	--	-2.5 %	-94.2 %	-5.0 %
HAD	Halmstad	--	--	--	--	--	--
HRK	Kharkiv	-31.9 %	-13.4 %	-20.5 %	-14.5 %	-21.4 %	-19.3 %
BCM	Bacău	117.1 %	--	--	116.7 %	--	--
BAL	Batman	226.8 %	709.9 %	447.5 %	1081.3 %	46280.2 %	3359.6 %
PLQ	Palanga	44.4 %	53.0 %	50.2 %	-23.0 %	82.9 %	27.9 %
ANX	Andoya	-10.0 %	102.5 %	2.5 %	40.5 %	--	--
ASF	Astrakhan	149.5 %	35696.1 %	1117.7 %	-9.0 %	400.7 %	163.9 %
BOH	Bournemouth	-56.4 %	-81.5 %	-57.4 %	29.2 %	-79.7 %	17.4 %
BVG	Berlevag	-12.1 %	--	--	-10.2 %	--	--
ORB	Orebro	--	--	--	--	--	--
KIR	Kerry	-40.1 %	89.5 %	2.5 %	-37.9 %	98.5 %	6.6 %
CFR	Caen	47.1 %	-18.7 %	13.5 %	68.9 %	-8.4 %	29.0 %
OST	Ostend	272.9 %	--	--	--	--	--
SFT	Skellefteå	--	--	--	--	--	--
RVN	Rovaniemi	-6.0 %	-1.0 %	-1.8 %	-23.8 %	15.4 %	7.2 %
LDE	Lourdes	51.8 %	71.4 %	58.2 %	67.6 %	115.3 %	81.9 %
SOJ	Sorkjosen	9.9 %	346.5 %	14.5 %	11.0 %	346.5 %	15.6 %
JOE	Joensuu	-3.2 %	-5.4 %	-4.8 %	-9.1 %	123.1 %	63.0 %
KLX	Kalamata	958.7 %	3252.1 %	1656.2 %	--	--	--
PNA	Pamplona	-61.2 %	-40.4 %	-45.8 %	-61.5 %	-4.8 %	-25.2 %

AIRPORT		CONNECTIVITY					
		Absolute 2016			Growth 2016 vs. 2015		
IATA code		direct	indirect	airport	direct	indirect	airport
MHQ	Maarianhamina	29	33	62	26.1 %	225.6 %	86.7 %
VDE	Hierro	29	1	30	0.0 %	-69.2 %	-6.7 %
KOK	Kronoby	29	140	169	-9.9 %	12.4 %	7.9 %
BLE	Borlänge	28	--	28	--	--	--
PAS	Paros	28	43	71	-3.4 %	26.2 %	12.5 %
LCJ	Lodz	28	56	84	-9.7 %	-16.2 %	-14.1 %
AXD	Alexandroupolis	28	24	52	-6.7 %	-13.1 %	-9.8 %
PIS	Poitiers	28	10	38	-29.8 %	-29.5 %	-29.7 %
KSY	Kars	28	39	67	32.8 %	523.5 %	146.6 %
ZAZ	Zaragoza	27	10	37	21.0 %	29.8 %	23.2 %
MLO	Milos	27	44	71	0.0 %	50.4 %	26.3 %
TOF	Tomsk	27	171	198	-38.6 %	-25.5 %	-27.6 %
VXO	Vaxjo	26	22	48	--	--	--
LKL	Lakselv	26	6	32	0.0 %	-6.4 %	-1.2 %
LUZ	Lublin	26	37	62	9.7 %	20.6 %	15.8 %
JSH	Sitia	26	0	26	7.5 %	21.4 %	7.7 %
LPI	Linköping	25	258	283	--	--	--
LXS	Limnos	24	30	53	-29.6 %	6.2 %	-13.3 %
JNX	Naxos	23	31	54	0.0 %	56.2 %	26.1 %
TGM	Targu Mures	23	1	23	280.7 %	-67.1 %	188.8 %
KUT	Kutaisi	23	20	42	0.7 %	254.8 %	51.3 %
ERC	Erzincan	23	63	85	8.3 %	18.3 %	15.5 %
KCM	Kahramanmaras	22	42	65	62.8 %	14.0 %	27.2 %
MXX	Mora	22	--	22	--	--	--
AJR	Arvidsjaur	22	19	41	--	--	--
KRF	Kramfors	22	16	38	--	--	--
PXO	Porto Santo	22	13	35	144.5 %	--	--
KAJ	Kajaani	22	126	148	4.8 %	18.1 %	15.9 %
LRS	Leros	22	6	28	0.0 %	4.6 %	1.0 %
KRN	Kiruna	22	49	70	36.0 %	54.7 %	48.4 %
OER	Ornskoldsvik	22	26	48	--	--	--
RJK	Rijeka	22	23	45	-5.4 %	-22.7 %	-15.3 %
MSR	Mus	21	40	61	14.6 %	59.4 %	40.2 %
LGG	Liege	21	1	22	-21.0 %	-98.2 %	-72.5 %
VHM	Vilhelmina	21	16	37	--	--	--
UIP	Quimper	21	14	35	-12.7 %	-1.3 %	-8.3 %
JKL	Kalymnos	21	9	29	0.0 %	-23.1 %	-8.2 %
LYR	Longyearbyen	20	100	121	17.0 %	35.7 %	32.1 %
FLW	Flores	20	0	20	37.1 %	-40.6 %	36.2 %
HFS	Hagfors	20	--	20	--	--	--
BDU	Bardufoss	20	25	45	0.0 %	-33.6 %	-21.9 %
EVG	Sveg	20	--	20	--	--	--
GEV	Gällivare	20	14	34	--	--	--
HAA	Hasvik	20	--	20	0.0 %	--	--
KSJ	Kasos	19	1	20	0.0 %	7.0 %	0.2 %

AIRPORT		CONNECTIVITY					
		Growth 2016 vs. 2008			Growth 2016 vs. 2006		
IATA code		direct	indirect	airport	direct	indirect	airport
MHQ	Maarianhamina	-14.7 %	--	--	-37.0 %	504.5 %	20.0 %
VDE	Hierro	-23.7 %	--	--	-17.1 %	-26.0 %	-17.5 %
KOK	Kronoby	-26.0 %	-15.6 %	-17.6 %	-32.0 %	93.8 %	47.3 %
BLE	Borlänge	--	--	--	--	--	--
PAS	Paros	55.6 %	135.9 %	95.9 %	47.4 %	92.9 %	71.9 %
LCJ	Lodz	-23.3 %	286.3 %	64.9 %	12.6 %	137.3 %	73.4 %
AXD	Alexandroupolis	-11.7 %	26.0 %	2.6 %	-21.7 %	-6.8 %	-15.4 %
PIS	Poitiers	-8.5 %	147.6 %	9.9 %	-3.6 %	47.0 %	6.1 %
KSY	Kars	45.2 %	170.4 %	99.3 %	99.3 %	--	--
ZAZ	Zaragoza	-56.2 %	-83.1 %	-68.9 %	-23.5 %	-76.2 %	-51.4 %
MLO	Milos	107.7 %	635.6 %	274.3 %	92.9 %	403.7 %	212.5 %
TOF	Tomsk	25.9 %	1323.3 %	492.4 %	37.7 %	2601.2 %	664.3 %
VXO	Vaxjo	--	--	--	--	--	--
LKL	Lakselv	4.0 %	90.0 %	13.1 %	4.0 %	118.5 %	14.7 %
LUZ	Lublin	--	--	--	--	--	--
JSH	Sitia	-9.4 %	-84.5 %	-14.0 %	167.3 %	-41.7 %	157.1 %
LPI	Linköping	--	--	--	--	--	--
LXS	Limnos	-34.8 %	107.3 %	5.7 %	-20.0 %	39.7 %	5.1 %
JNX	Naxos	187.5 %	266.1 %	228.0 %	187.5 %	543.5 %	321.6 %
TGM	Targu Mures	44.1 %	-83.7 %	16.6 %	10.3 %	-92.0 %	-20.4 %
KUT	Kutaisi	246.0 %	1355.4 %	437.1 %	377.2 %	3696.3 %	706.1 %
ERC	Erzincan	129.3 %	360.8 %	263.5 %	464.0 %	--	--
KCM	Kahramanmaras	127.8 %	321.4 %	225.4 %	124.9 %	--	--
MXX	Mora	--	--	--	--	--	--
AJR	Arvidsjaur	--	--	--	--	--	--
KRF	Kramfors	--	--	--	--	--	--
PXO	Porto Santo	-39.9 %	133.5 %	-17.1 %	-58.5 %	-35.5 %	-52.2 %
KAJ	Kajaani	11.5 %	32.3 %	28.8 %	3.5 %	64.4 %	51.2 %
LRS	Leros	33.7 %	25.8 %	31.9 %	35.1 %	2.7 %	26.4 %
KRN	Kiruna	-26.2 %	53.3 %	15.2 %	-37.3 %	53.9 %	6.3 %
OER	Ornskoldsvik	--	--	--	--	--	--
RJK	Rijeka	66.1 %	400.5 %	154.9 %	35.1 %	391.5 %	117.2 %
MSR	Mus	208.4 %	649.8 %	399.2 %	614.7 %	--	--
LGG	Liege	52.5 %	145.1 %	55.0 %	--	--	--
VHM	Vilhelmina	--	--	--	--	--	--
UIP	Quimper	-17.4 %	-9.0 %	-14.1 %	-17.4 %	-6.5 %	-13.2 %
JKL	Kalymnos	157.3 %	103.2 %	138.5 %	--	--	--
LYR	Longyearbyen	6.7 %	92.2 %	69.3 %	19.2 %	111.3 %	86.9 %
FLW	Flores	-0.8 %	-36.5 %	-1.1 %	4.8 %	--	--
HFS	Hagfors	--	--	--	--	--	--
BDU	Bardufoss	33.3 %	62.0 %	47.9 %	5.3 %	-55.1 %	-39.7 %
EVG	Sveg	--	--	--	--	--	--
GEV	Gällivare	--	--	--	--	--	--
HAA	Hasvik	6.3 %	--	--	33.9 %	--	--
KSJ	Kasos	-21.7 %	--	--	26.3 %	--	--

AIRPORT		CONNECTIVITY					
		Absolute 2016			Growth 2016 vs. 2015		
IATA code		direct	indirect	airport	direct	indirect	airport
YEI	Yenisehir	19	--	19	--	--	--
THN	Trollhättan	19	9	28	--	--	--
NVK	Narvik	19	0	19	0.0 %	0.0 %	0.0 %
NKT	Sirnak	19	9	27	--	--	--
TYF	Torsby	18	--	18	--	--	--
LYC	Lycksele	18	15	33	--	--	--
JIK	Ikaria	18	4	21	-8.7 %	-67.8 %	-30.1 %
RET	Rost	17	--	17	0.0 %	--	--
ADF	Adiyaman	17	31	48	20.7 %	-2.9 %	4.2 %
GRQ	Groningen	16	1	17	30.3 %	--	--
JYV	Tikkakoski	16	120	136	-11.1 %	11.6 %	8.3 %
FNI	Nimes	16	0	16	0.0 %	-70.9 %	-3.0 %
SXZ	Siirt	15	0	15	--	--	--
SMA	Santa Maria	15	3	18	23.9 %	67.5 %	30.0 %
TUF	Tours	15	6	21	398.6 %	615.8 %	449.6 %
HMV	Hemavan	14	9	24	--	--	--
IOA	Ioannina	14	17	31	0.0 %	-19.4 %	-11.6 %
DNR	Dinard	14	8	22	7.7 %	20.6 %	12.0 %
GMZ	La Gomera	14	1	15	0.0 %	-76.8 %	-10.5 %
OSI	Osijek	14	2	16	45.6 %	--	--
CRA	Craiova	14	--	14	--	--	--
AJI	Agri	14	19	33	-0.9 %	-31.0 %	-21.1 %
IGD	Igdir	14	64	77	-0.8 %	249.3 %	142.0 %
IVL	Ivalo	13	31	44	0.4 %	-29.5 %	-22.6 %
CKZ	Çanakkale	13	--	13	85.7 %	--	--
TEQ	Çorlu	13	--	13	0.0 %	--	--
PMF	Parma	13	1	14	8.4 %	-11.8 %	6.0 %
OMR	Oradea	12	5	18	--	--	--
RRS	Roeros	12	0	12	0.0 %	0.0 %	0.0 %
VST	Stockholm	12	25	37	--	--	--
JTY	Astypalaia	12	8	20	0.0 %	-17.1 %	-7.7 %
KID	Kristianstad	11	--	11	--	--	--
VLL	Valladolid	11	5	16	-8.3 %	-29.9 %	-16.0 %
GPA	Araxos/Patras	11	14	25	37.4 %	0.5 %	13.9 %
KEM	Kemi-Tornio	11	15	26	-30.7 %	-81.2 %	-73.1 %
KIT	Kithira	11	9	20	-25.9 %	5.2 %	-14.3 %
CND	Constanta	11	34	45	120.3 %	21.8 %	36.4 %
NAL	Nalchik	11	4	14	52.4 %	375.1 %	85.5 %
MZH	Amasya	11	44	54	-1.0 %	-28.5 %	-24.4 %
DLE	Dole	11	1	11	-44.5 %	--	--
SVL	Savonlinna	10	--	10	--	--	--
BJZ	Badajoz	10	66	76	-7.4 %	455.6 %	235.7 %
YKO	Yüksekova	10	57	67	--	--	--
BGG	Bingöl	10	6	15	--	--	--
KFS	Kastamonu	10	59	69	--	--	--

AIRPORT		CONNECTIVITY					
		Growth 2016 vs. 2008			Growth 2016 vs. 2006		
IATA code		direct	indirect	airport	direct	indirect	airport
YEI	Yenisehir	280.0 %	--	--	--	--	--
THN	Trollhättan	--	--	--	--	--	--
NVK	Narvik	-20.8 %	-82.6 %	-23.3 %	-20.8 %	-91.3 %	-26.3 %
NKT	Sirnak	--	--	--	--	--	--
TYF	Torsby	--	--	--	--	--	--
LYC	Lycksele	--	--	--	--	--	--
JIK	Ikaria	192.0 %	-5.6 %	116.3 %	192.0 %	67.3 %	159.7 %
RET	Rost	44.7 %	--	--	44.7 %	--	--
ADF	Adiyaman	40.8 %	216.5 %	120.7 %	139.1 %	697.8 %	340.1 %
GRQ	Groningen	15.9 %	--	--	231.1 %	--	--
JYV	Tikkakoski	-67.3 %	-36.8 %	-43.1 %	-68.6 %	76.1 %	14.0 %
FNI	Nimes	-11.8 %	-90.5 %	-20.3 %	-11.3 %	-88.2 %	-18.2 %
SXZ	Siirt	--	--	--	--	--	--
SMA	Santa Maria	-1.5 %	7.3 %	-0.0 %	-1.5 %	18.5 %	1.6 %
TUF	Tours	63.9 %	108.1 %	75.3 %	111.5 %	32.2 %	78.7 %
HMV	Hemavan	--	--	--	--	--	--
IOA	Ioannina	-33.3 %	139.0 %	9.6 %	-33.3 %	78.0 %	1.0 %
DNR	Dinard	-41.7 %	-17.6 %	-34.8 %	-32.6 %	-2.8 %	-24.2 %
GMZ	La Gomera	-50.0 %	--	--	-50.0 %	-3.3 %	-49.1 %
OSI	Osijek	595.0 %	49.6 %	365.0 %	--	--	--
CRA	Craiova	53.7 %	--	--	--	--	--
AJI	Agri	97.1 %	32.7 %	53.3 %	355.6 %	--	--
IGD	Igdir	--	--	--	--	--	--
IVL	Ivalo	38.3 %	22.4 %	26.7 %	15.5 %	380.1 %	147.1 %
CKZ	Çanakkale	116.7 %	--	--	--	--	--
TEQ	Çorlu	--	--	--	--	--	--
PMF	Parma	-68.3 %	-98.6 %	-89.8 %	116.1 %	-96.5 %	-68.7 %
OMR	Oradea	-30.8 %	58.4 %	-16.8 %	-32.5 %	862.6 %	-6.7 %
RRS	Roeros	100.0 %	-75.0 %	92.0 %	100.0 %	-19.3 %	98.3 %
VST	Stockholm	--	--	--	--	--	--
JTY	Astypalaia	-0.0 %	229.7 %	39.6 %	8.6 %	1313.8 %	74.0 %
KID	Kristianstad	--	--	--	--	--	--
VLL	Valladolid	-87.3 %	-94.2 %	-90.6 %	-81.7 %	-92.6 %	-87.3 %
GPA	Araxos/Patras	-23.4 %	119.9 %	20.9 %	-21.6 %	890.7 %	62.5 %
KEM	Kemi-Tornio	-66.0 %	82.4 %	-35.1 %	-56.4 %	-27.0 %	-43.0 %
KIT	Kithira	54.3 %	62.4 %	57.9 %	54.3 %	32.4 %	43.5 %
CND	Constanta	9.6 %	1290.1 %	264.7 %	-10.7 %	297.4 %	117.2 %
NAL	Nalchik	--	--	--	52.4 %	--	--
MZH	Amasya	--	--	--	--	--	--
DLE	Dole	--	--	--	--	--	--
SVL	Savonlinna	-47.6 %	--	--	-44.3 %	--	--
BJZ	Badajoz	-61.0 %	4.6 %	-14.3 %	400.0 %	--	--
YKO	Yüksekova	--	--	--	--	--	--
BGG	Bingöl	--	--	--	--	--	--
KFS	Kastamonu	--	--	--	--	--	--

AIRPORT		CONNECTIVITY					
		Absolute 2016			Growth 2016 vs. 2015		
IATA code		direct	indirect	airport	direct	indirect	airport
SNR	Saint-Nazaire	9	--	9	0.0 %	--	--
KLV	Karlovy Vary	8	16	24	-11.1 %	-44.6 %	-36.5 %
LEN	Leon	8	12	20	--	--	--
NRK	Norrköping	8	7	15	--	--	--
ANE	Marce	7	2	10	32.0 %	110.1 %	45.1 %
KZS	Kastelorizo	7	--	7	0.0 %	--	--
KTT	Kittilä	7	44	51	0.0 %	-29.7 %	-26.7 %
NOP	Sinop	7	63	69	-2.5 %	18.5 %	16.0 %
ISE	Süleyman Demirel-Isp	7	63	69	-4.8 %	53.8 %	45.2 %
KSF	Kassel	6	--	6	0.0 %	--	--
KSO	Kastoria	6	--	6	19.0 %	--	--
RJL	Logroño	6	30	36	0.0 %	-4.9 %	-4.1 %
JSY	Syros Island	6	16	22	0.0 %	259.8 %	112.0 %
SKU	Skiros	6	3	9	0.0 %	29.8 %	8.5 %
KAO	Kuusamo	6	61	67	0.0 %	1.9 %	1.7 %
SUJ	Satu Mare	6	4	9	0.0 %	36.8 %	11.4 %
KCO	Kocaeli	5	--	5	--	--	--
OHD	Ohrid	5	--	5	38.6 %	--	--
VOL	Volos	5	1	6	26.2 %	-52.2 %	-6.5 %
KZI	Kozani	4	--	4	-21.6 %	--	--
TJK	Tokat	4	--	4	--	--	--
INI	Nis	4	1	5	--	--	--
PDV	Plovdiv	3	--	3	-40.2 %	--	--
GNB	Grenoble	3	0	3	--	--	--
BWK	Brač	2	--	2	100.0 %	--	--
CMF	Chambery	2	--	2	--	--	--
AVN	Avignon	2	0	2	0.8 %	--	--
CHR	Chateroux	2	--	2	0.0 %	--	--
EPL	Vosges	2	--	2	0.0 %	--	--
PED	Pardubice	1	--	1	--	--	--
SIR	Sion	1	--	1	--	--	--

AIRPORT		CONNECTIVITY					
		Growth 2016 vs. 2008			Growth 2016 vs. 2006		
IATA code		direct	indirect	airport	direct	indirect	airport
SNR	Saint-Nazaire	-1.5 %	--	--	--	--	--
KLV	Karlovy Vary	15.9 %	-33.8 %	-22.5 %	167.6 %	-13.2 %	12.6 %
LEN	Leon	-82.9 %	-73.3 %	-78.1 %	-63.9 %	--	--
NRK	Norrköping	--	--	--	--	--	--
ANE	Marce	104.1 %	208.4 %	122.3 %	153.5 %	39.3 %	111.5 %
KZS	Kastelorizo	16.7 %	--	--	40.0 %	--	--
KTT	Kittilä	-7.4 %	73.5 %	54.9 %	-18.3 %	355.7 %	180.0 %
NOP	Sinop	--	--	--	--	--	--
ISE	Süleyman Demirel-Isp	--	--	--	566.3 %	--	--
KSF	Kassel	--	--	--	--	--	--
KSO	Kastoria	103.4 %	--	--	103.4 %	--	--
RJL	Logroño	-65.9 %	-35.6 %	-43.9 %	-53.5 %	-17.1 %	-26.6 %
JSY	Syros Island	500.0 %	290.0 %	330.4 %	20.0 %	763.4 %	224.4 %
SKU	Skiros	0.0 %	-45.5 %	-22.2 %	20.0 %	31.1 %	23.6 %
KAO	Kuusamo	-4.1 %	18.2 %	15.9 %	-17.8 %	41.6 %	33.3 %
SUJ	Satu Mare	-55.6 %	234.6 %	-33.6 %	-36.1 %	53.9 %	-17.7 %
KCO	Kocaeli	--	--	--	--	--	--
OHD	Ohrid	-48.5 %	--	--	-32.5 %	--	--
VOL	Volos	134.4 %	47.6 %	108.2 %	--	--	--
KZI	Kozani	26.2 %	--	--	-15.9 %	--	--
TJK	Tokat	--	--	--	--	--	--
INI	Nis	100.0 %	--	--	33.3 %	--	--
PDV	Plovdiv	--	--	--	--	--	--
GNB	Grenoble	-53.6 %	-95.6 %	-63.5 %	-72.9 %	-98.3 %	-80.9 %
BWK	Brač	--	--	--	--	--	--
CMF	Chambery	--	--	--	6.6 %	--	--
AVN	Avignon	-93.4 %	-96.9 %	-94.5 %	-92.8 %	-96.5 %	-94.0 %
CHR	Chateroux	--	--	--	--	--	--
EPL	Vosges	--	--	--	-82.8 %	--	--
PED	Pardubice	--	--	--	--	--	--
SIR	Sion	--	--	--	--	--	--

Appendix H Hub Connectivity by individual airport

AIRPORT		HUB CONNECTIVITY			
IATA code		Absolute 2016	Growth 2016 vs. 2015	Growth 2016 vs. 2008	Growth 2016 vs. 2006
FRA	Frankfurt	68 877	-6.7%	9.4%	12.3%
AMS	Amsterdam	52 141	4.9%	40.6%	60.2%
CDG	Paris	48 049	-5.3%	-3.0%	3.8%
IST	Istanbul	34 392	0.8%	473.9%	771.1%
LHR	London	32 619	-1.2%	10.6%	17.0%
MUC	Munich	27 754	-3.0%	2.2%	43.0%
MAD	Madrid	17 599	11.2%	-11.5%	10.4%
SVO	Moscow	15 879	4.3%	191.1%	331.3%
ZRH	Zurich	15 374	5.5%	16.3%	28.9%
VIE	Vienna	13 396	1.4%	-7.5%	-6.3%
FCO	Rome	13 254	6.0%	9.2%	118.2%
HEL	Helsinki	8 509	8.2%	28.2%	75.5%
BRU	Brussels	6 504	-5.6%	82.0%	126.8%
CPH	Copenhagen	5 831	1.6%	-25.1%	-24.9%
LIS	Lisbon	5 164	17.5%	64.3%	141.5%
DUS	Düsseldorf	4 128	32.4%	55.8%	262.2%
OSL	Oslo	3 948	-4.3%	25.9%	34.4%
DUB	Dublin	3 239	23.8%	188.5%	352.1%
SAW	Istanbul	3 146	15.9%	39063.2%	162846.1%
WAW	Warsaw	3 067	38.4%	95.4%	76.3%
BCN	Barcelona	3 009	0.0%	-16.0%	-7.7%
ARN	Stockholm	2 898	35.8%	24.5%	54.1%
ATH	Athens	2 894	5.9%	111.1%	107.4%
DME	Moscow	2 563	7.5%	276.2%	525.3%
KEF	Keflavik	2 517	40.8%	795.5%	600.6%
TXL	Berlin	2 448	-2.0%	581.0%	1179.3%
PRG	Prague	1 458	20.1%	-54.6%	-41.9%
ORY	Paris	1 366	14.4%	28.2%	11.1%
STN	London	1 355	7.7%	21.4%	36.3%
GVA	Geneva	1 284	-1.6%	184.4%	387.1%
LGW	London	1 134	-11.8%	11.5%	-35.5%
KBP	Kiev	924	3.1%	238.6%	335.4%
MAN	Manchester	905	-6.3%	4.1%	-9.9%
MXP	Milan	817	1.4%	-4.0%	-89.9%
LED	St Petersburg	651	-37.6%	50.2%	110.6%
LIN	Milan	566	-2.4%	117.2%	217.4%
BMA	Stockholm	554	101.3%	1500.7%	761.8%
STR	Stuttgart	544	-8.2%	-3.0%	64.2%
HAM	Hamburg	511	3.5%	-18.8%	43.4%
CGN	Cologne	506	20.0%	25.6%	36.7%
LCY	London	464	24.5%	158.8%	550.0%
LYS	Lyon	433	11.7%	-59.0%	-58.9%
PMI	Palma De Mallorca	378	-41.2%	-63.1%	-46.0%
VCE	Venice	330	2.3%	95.5%	25.6%
BEG	Belgrade	297	-1.5%	609.9%	477.2%

AIRPORT		HUB CONNECTIVITY			
IATA code		Absolute 2016	Growth 2016 vs. 2015	Growth 2016 vs. 2008	Growth 2016 vs. 2006
OTP	Bucharest	278	7.6%	27.1%	35.5%
RIX	Riga	267	36.6%	75.2%	754.6%
BRS	Bristol	218	6.5%	101.5%	131.9%
BSL	Basel	198	7.0%	297.2%	766.7%
BHX	Birmingham	197	110.9%	166.7%	82.4%
BGY	Milan	181	3.0%	621.9%	1404.4%
OPO	Porto	147	67.4%	-16.9%	12.8%
EDI	Edinburgh	136	108.4%	917.9%	475.2%
BGO	Bergen	132	-24.0%	4.6%	-5.7%
NCE	Nice	117	-17.5%	1.1%	-34.8%
GOT	Gothenburg	113	38.1%	-43.0%	-44.4%
AGP	Malaga	112	20.9%	158.4%	16.2%
LPL	Liverpool	110	23.3%	--	--
TLV	Tel-Aviv	101	-16.8%	84.4%	14.7%
SVG	Stavanger	100	-53.4%	18.6%	19.7%
BUD	Budapest	97	26.9%	-91.1%	-91.1%
GLA	Glasgow	92	35.8%	117.0%	-39.7%
BLQ	Bologna	91	17.6%	242.7%	536.9%
TOS	Tromsoe	72	13.6%	147.3%	180.8%
CRL	Charleroi	72	26.9%	1098.2%	632.2%
SOU	Southampton	70	-3.2%	-50.8%	-26.7%
LJU	Ljubljana	70	-33.5%	-60.6%	-10.1%
SKG	Thessaloniki	69	24.0%	43.5%	120.4%
BOD	Bordeaux	69	45.6%	-58.5%	-72.2%
MRS	Marseille	65	-41.9%	-79.3%	-83.8%
HAJ	Hanover	62	23.0%	-20.9%	7.5%
BIO	Bilbao	61	-8.4%	-20.1%	9.9%
EMA	East Midlands	57	1.7%	-35.1%	-13.5%
SVX	Ekaterinburg	54	155.1%	208.6%	203.7%
NUE	Nuremberg	52	1.8%	-59.9%	-41.6%
IBZ	Ibiza	50	6.1%	910.9%	2307.8%
TLS	Toulouse	49	9.6%	81.9%	-27.4%
SXF	Berlin	42	66.0%	3.4%	77.2%
SVQ	Sevilla	40	33.7%	-18.1%	-23.7%
VLC	Valencia	39	12.7%	-48.3%	-34.0%
NAP	Naples	38	42.1%	91.8%	270.3%
SOF	Sofia	37	38.7%	-28.5%	267.5%
SNN	Shannon	37	76.8%	47.5%	-24.2%
EIN	Eindhoven	34	-28.6%	218.1%	1571.5%
LPA	Gran Canaria	29	-22.9%	396.2%	45.6%
BLL	Billund	29	65.6%	-8.8%	56.7%
ALC	Alicante	27	-20.9%	79.7%	90.0%
BOO	Bodo	27	-15.8%	177.9%	115.1%
BRE	Bremen	27	10.2%	-15.7%	563.4%
TRN	Turin	26	34.8%	-47.8%	-14.9%

AIRPORT		HUB CONNECTIVITY			
IATA code		Absolute 2016	Growth 2016 vs. 2015	Growth 2016 vs. 2008	Growth 2016 vs. 2006
CIA	Rome	25	-28.1%	714.7%	1403.1%
NTE	Nantes	25	14.0%	316.9%	11.1%
LCA	Larnaca	24	56.8%	-74.8%	-68.2%
KIV	Chisinau	24	-19.9%	270.1%	428.4%
MSQ	Minsk	23	31.7%	7626.9%	3237.6%
ESB	Ankara	22	7.4%	-28.6%	-32.3%
SZG	Salzburg	21	25.2%	195.7%	87.1%
OVB	Novosibirsk	21	167.7%	244.3%	201.5%
FLR	Florence	21	-23.6%	50.6%	177.3%
TFN	Tenerife	19	-35.0%	--	301.3%
TRD	Trondheim	18	21.4%	-11.6%	-29.8%
AYT	Antalya	17	70.3%	38.3%	61.5%
SXB	Strasbourg	17	-31.9%	-74.0%	-63.8%
TSF	Treviso	16	107.7%	838.9%	1496.3%
ABZ	Aberdeen	16	-20.4%	-3.6%	12.9%
GRZ	Graz	15	44.3%	40.1%	23.3%
WMI	Warsaw	14	64.5%	--	--
PDL	Ponta Delgada	14	-37.3%	64.8%	85.6%
MLA	Malta	13	-73.9%	-56.7%	-69.4%
TLL	Tallinn	13	-21.9%	81.7%	237.8%
BRN	Bern	13	81.0%	--	2075.6%
HER	Heraklion	12	24.7%	2907.6%	--
ADB	Izmir	11	-1.0%	-74.7%	-47.6%
WRO	Wroclaw	11	27.6%	22.6%	1259.4%
KTW	Katowice	10	49.0%	69.6%	469.9%
SCQ	Santiago de Compostela	10	-5.4%	620.6%	746.0%
RHO	Rhodes	10	18.6%	5841.3%	--
VVO	Vladivostok	9	136.2%	70.2%	69.7%
SPU	Split	8	11.7%	39.7%	81.3%
PMO	Palermo	7	-33.6%	-50.9%	-46.3%
CHQ	Chania	6	55.3%	--	--
FAO	Faro	6	167.2%	-28.1%	-49.6%
GRO	Girona	5	-62.6%	-93.8%	-70.2%
LNZ	Linz	5	6.5%	-33.7%	-7.7%
ADA	Adana	5	1681.7%	--	327.6%
FNC	Funchal	5	67.9%	-72.5%	-89.5%
BTS	Bratislava	4	60.3%	-75.0%	-82.9%
VNO	Vilnius	4	-33.0%	-85.1%	-33.6%
MHQ	Maarianhamina	4	25.0%	--	--
INN	Innsbruck	4	72.7%	93.2%	35.2%
JSI	Skiathos	4	--	--	--
TFS	Tenerife	3	-42.0%	-71.2%	-80.9%
DBV	Dubrovnik	3	287.0%	905.5%	2725.6%
ORK	Cork	3	-50.7%	-41.0%	67.1%
ROV	Rostov	3	--	--	--
OLB	Olbia	3	-0.5%	238.4%	-16.8%

AIRPORT		HUB CONNECTIVITY			
IATA code		Absolute 2016	Growth 2016 vs. 2015	Growth 2016 vs. 2008	Growth 2016 vs. 2006
ODS	Odessa	3	-33.6%	2.9%	39.3%
IAS	Iasi	3	58.6%	--	--
MAH	Menorca	2	89.4%	--	200.3%
NYO	Stockholm	2	--	--	--
CAG	Cagliari	2	28.1%	38.6%	-32.3%
FMO	Muenster	2	-61.6%	-83.8%	-71.5%
TJM	Tyumen	2	--	--	--
KRK	Krakow	2	229.2%	-85.1%	-89.8%
TIV	Tivat	2	-61.5%	122.1%	47.1%
MMX	Malmo	2	--	-79.1%	--
LLA	Luleå	2	--	--	--
TGD	Podgorica	1	0.7%	322.1%	2452.7%
KUF	Samara	1	48.6%	-80.2%	-88.8%
SJJ	Sarajevo	1	98.8%	853.8%	--
TBS	Tbilisi	1	96.8%	-59.8%	-1.1%
OST	Ostend	1	388.8%	--	--
FMM	Memmingerberg	1	4.1%	-70.2%	--
POZ	Poznan	1	34.8%	-69.4%	57.2%
TPS	Trapani	1	28.6%	--	1934.0%
BRQ	Brno	1	-16.5%	--	--
JTR	Santorini/Thira	1	-22.2%	--	69.9%
CFU	Kerkyra	1	-52.7%	-79.0%	-77.3%
OSR	Ostrava	1	2.7%	--	--
KUN	Kaunas	1	40.8%	--	--
LGG	Liege	1	262.6%	-40.7%	--
AER	Sochi	1	-86.9%	--	--
LIL	Lille	1	-69.7%	-88.0%	-71.9%
TIA	Tirana	1	--	-75.2%	-87.0%
TRS	Trieste	1	-34.4%	--	10.4%
VRN	Verona	1	70.5%	-75.7%	-77.4%
PRN	Pristina	1	--	--	--
ANR	Antwerp	1	154.4%	--	--
BJV	Bodrum	1	8.9%	16.8%	153.1%
FDH	Friedrichshafen	1	-69.6%	--	2776.2%
EDO	Balikesir	1	--	--	--
KYA	Konya	1	170.6%	--	-61.5%
KIR	Kerry	1	33.3%	--	--
FUE	Fuerteventura	0	-74.1%	-74.5%	-75.3%
KVA	Kavala	0	--	--	99.1%
BOJ	Bourgas	0	--	--	--
NOC	Knock	0	-78.7%	--	--
CLJ	Cluj	0	--	162.8%	--
JER	Jersey	0	--	22.7%	764.1%
ACE	Lanzarote	0	-46.9%	-93.2%	-58.5%
JMK	Mikonos	0	-37.0%	-59.8%	-47.6%
MRV	Mineralnye Vody	0	-92.8%	-55.5%	-62.2%

AIRPORT		HUB CONNECTIVITY			
IATA code		Absolute 2016	Growth 2016 vs. 2015	Growth 2016 vs. 2008	Growth 2016 vs. 2006
CFE	Clermont-Ferrand	0	--	-83.5%	-80.2%
XRY	Jerez	0	--	--	--
ZAD	Zadar	0	0.0%	--	52.7%
VAR	Varna	0	-76.0%	39.6%	-23.7%
GOJ	Nizhniy Novgorod	0	--	--	--
KRS	Kristiansand	0	234.4%	-59.2%	-79.2%
INV	Inverness	0	--	--	-82.5%
BUS	Batumi	0	--	--	--
PFO	Paphos	0	--	-97.5%	-94.8%
KLU	Klagenfurt	0	--	--	--
DLM	Mugla	0	-99.0%	-99.9%	-99.9%
MCM	Monaco		--	--	--
LUX	Luxembourg		--	--	--
ZAG	Zagreb		--	--	--
RTM	Rotterdam		--	--	--
TZX	Trabzon		--	--	--
IOM	Isle Of Man		--	--	--
KGS	Kos		--	--	--
AJA	Ajaccio		--	--	--
KZN	Kazan		--	--	--
UME	Umeå		--	--	--
GZT	Gaziantep		--	--	--
SKP	Skopje		--	--	--
ASR	Kayseri		--	--	--
HFT	Hammerfest		--	--	--
RNS	Rennes		--	--	--
KGD	Kaliningrad		--	--	--
SPC	La Palma		--	--	--
BIQ	Biarritz		--	--	--
AES	Aalesund		--	--	--
DIY	Diyarbakir		--	--	--
BES	Brest		--	--	--
VDS	Vadso		--	--	--
SZF	Samsun		--	--	--
OVD	Asturias		--	--	--
ALF	Alta		--	--	--
ZTH	Zakynthos Island		--	--	--
LEI	Almería		--	--	--
KKN	Kirkenes		--	--	--
OUL	Oulunsalo		--	--	--
LCG	A Coruna		--	--	--
VBY	Visby		--	--	--
HTY	Antakya		--	--	--
MJV	Murcia		--	--	--
TSR	Timisoara		--	--	--
PUF	Pau		--	--	--

AIRPORT		HUB CONNECTIVITY			
IATA code		Absolute 2016	Growth 2016 vs. 2015	Growth 2016 vs. 2008	Growth 2016 vs. 2006
NQY	Newquay		--	--	--
SDR	Santander		--	--	--
BNN	Bronnoysund		--	--	--
VGO	Vigo		--	--	--
OSD	Ostersund		--	--	--
CEK	Chelyabinsk		--	--	--
MJF	Mosjoen		--	--	--
SSJ	Sandnessjoen		--	--	--
MMK	Murmansk		--	--	--
MQN	Mo i Rana		--	--	--
EVE	Harstad		--	--	--
MOL	Molde		--	--	--
MLN	Melilla		--	--	--
AGH	Angelholm		--	--	--
VAN	Van		--	--	--
GRX	Granada		--	--	--
TKU	Turku		--	--	--
ERZ	Erzurum		--	--	--
FRO	Floro		--	--	--
PEE	Perm		--	--	--
KSU	Kristiansund		--	--	--
SKN	Stokmarknes		--	--	--
HAU	Haugesund		--	--	--
EZS	Elazığ		--	--	--
REU	Reus		--	--	--
SDL	Sundsvall		--	--	--
MJT	Mytilene		--	--	--
SOG	Sogndal		--	--	--
ETH	Eilath		--	--	--
VAA	Vaasa		--	--	--
GZP	Gazipasa		--	--	--
PUY	Pula		--	--	--
SMI	Samos		--	--	--
MEH	Mehamn		--	--	--
TLN	Toulon		--	--	--
KLR	Kalmar		--	--	--
BJF	Batsfjord		--	--	--
GNY	Sanliurfa		--	--	--
TMP	Tampere		--	--	--
LKN	Leknes		--	--	--
HVG	Honningsvag		--	--	--
MLX	Malatya		--	--	--
LIG	Limoges		--	--	--
EAS	San Sebastian		--	--	--
LRH	La Rochelle		--	--	--
VAS	Sivas		--	--	--

AIRPORT		HUB CONNECTIVITY			
IATA code		Absolute 2016	Growth 2016 vs. 2015	Growth 2016 vs. 2008	Growth 2016 vs. 2006
RNB	Ronneby		--	--	--
VOG	Volgograd		--	--	--
EFL	Kefallinia		--	--	--
JKG	Jönköping		--	--	--
PGF	Perpignan		--	--	--
HOV	Orsta		--	--	--
KUO	Kuopio		--	--	--
SBZ	Sibiu		--	--	--
VAW	Vardo		--	--	--
DNZ	Çardak		--	--	--
KSD	Karlstad		--	--	--
AOK	Karpathos		--	--	--
PVK	Preveza/Lefkas		--	--	--
SVJ	Svolvaer		--	--	--
FDE	Forde		--	--	--
NAV	Nevsehir/Kapadokya		--	--	--
OSY	Namsos		--	--	--
JKH	Chios		--	--	--
RVK	Rorvik		--	--	--
MQM	Mardin		--	--	--
HTA	Chita		--	--	--
SDV	Tel-Aviv		--	--	--
HOR	Horta		--	--	--
SDN	Sandane		--	--	--
HAD	Halmstad		--	--	--
HRK	Kharkiv		--	--	--
BCM	Bacău		--	--	--
BAL	Batman		--	--	--
PLQ	Palanga		--	--	--
ANX	Andoya		--	--	--
ASF	Astrakhan		--	--	--
BOH	Bournemouth		--	--	--
BVG	Berlevag		--	--	--
ORB	Orebro		--	--	--
CFR	Caen		--	--	--
SFT	Skellefteå		--	--	--
RVN	Rovaniemi		--	--	--
LDE	Lourdes		--	--	--
SOJ	Sorkjosen		--	--	--
JOE	Joensuu		--	--	--
KLX	Kalamata		--	--	--
PNA	Pamplona		--	--	--
VDE	Hierro		--	--	--
KOK	Kronoby		--	--	--
BLE	Borlänge		--	--	--
PAS	Paros		--	--	--

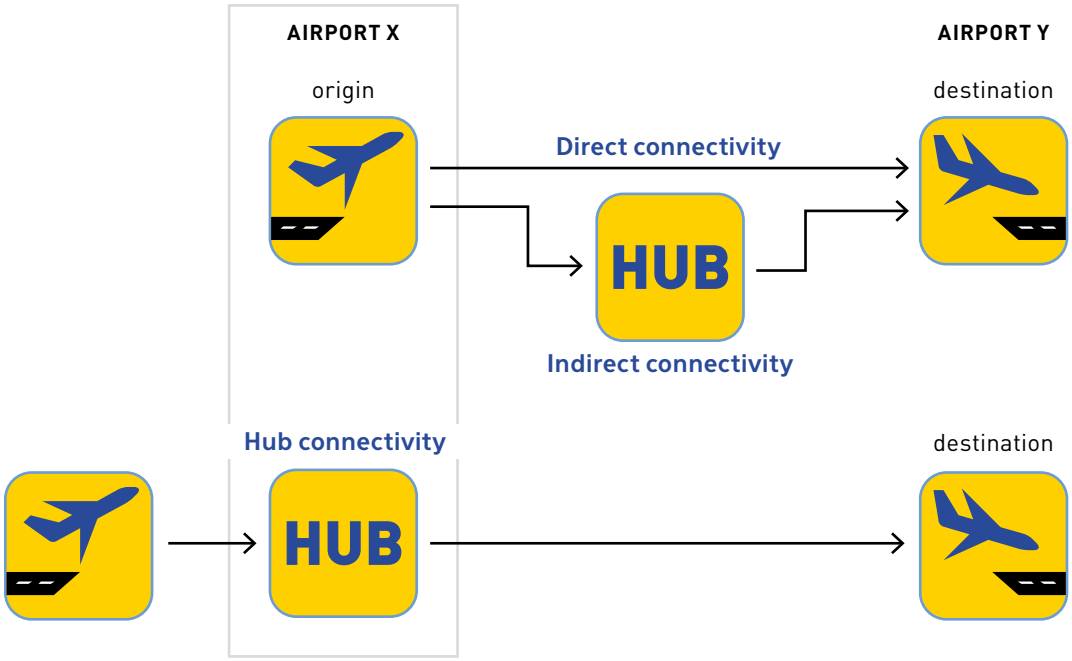
AIRPORT		HUB CONNECTIVITY			
IATA code		Absolute 2016	Growth 2016 vs. 2015	Growth 2016 vs. 2008	Growth 2016 vs. 2006
LCJ	Lodz		--	--	--
AXD	Alexandroupolis		--	--	--
PIS	Poitiers		--	--	--
KSY	Kars		--	--	--
ZAZ	Zaragoza		--	--	--
MLO	Milos		--	--	--
TOF	Tomsk		--	--	--
VXO	Vaxjo		--	--	--
LKL	Lakselv		--	--	--
LUZ	Lublin		--	--	--
JSH	Sitia		--	--	--
LPI	Linköping		--	--	--
LXS	Limnos		--	--	--
JNX	Naxos		--	--	--
TGM	Targu Mures		--	--	--
KUT	Kutaisi		--	--	--
ERC	Erzincan		--	--	--
KCM	Kahramanmaras		--	--	--
MXX	Mora		--	--	--
AJR	Arvidsjaur		--	--	--
KRF	Kramfors		--	--	--
PXO	Porto Santo		--	--	--
KAJ	Kajaani		--	--	--
LRS	Leros		--	--	--
KRN	Kiruna		--	--	--
OER	Ornskoldsvik		--	--	--
RJK	Rijeka		--	--	--
MSR	Mus		--	--	--
VHM	Vilhelmina		--	--	--
UIP	Quimper		--	--	--
JKL	Kalymnos		--	--	--
LYR	Longyearbyen		--	--	--
FLW	Flores		--	--	--
HFS	Hagfors		--	--	--
BDU	Bardufoss		--	--	--
EVG	Sveg		--	--	--
GEV	Gällivare		--	--	--
HAA	Hasvik		--	--	--
KSJ	Kasos		--	--	--
YEI	Yenisehir		--	--	--
THN	Trollhättan		--	--	--
NVK	Narvik		--	--	--
NKT	Sirnak		--	--	--
TYF	Torsby		--	--	--
LYC	Lycksele		--	--	--
JIK	Ikaria		--	--	--

AIRPORT		HUB CONNECTIVITY			
IATA code		Absolute 2016	Growth 2016 vs. 2015	Growth 2016 vs. 2008	Growth 2016 vs. 2006
RET	Rost		--	--	--
ADF	Adiyaman		--	--	--
GRQ	Groningen		--	--	--
JYV	Tikkakoski		--	--	--
FNI	Nimes		--	--	--
SXZ	Siirt		--	--	--
SMA	Santa Maria		--	--	--
TUF	Tours		--	--	--
HMV	Hemavan		--	--	--
IOA	Ioannina		--	--	--
DNR	Dinard		--	--	--
GMZ	La Gomera		--	--	--
OSI	Osijek		--	--	--
CRA	Craiova		--	--	--
AJI	Agri		--	--	--
IGD	Igdir		--	--	--
IVL	Ivalo		--	--	--
CKZ	Çanakkale		--	--	--
TEQ	Çorlu		--	--	--
PMF	Parma		--	--	--
OMR	Oradea		--	--	--
RRS	Roeros		--	--	--
VST	Stockholm		--	--	--
JTY	Astypalaia		--	--	--
KID	Kristianstad		--	--	--
VLL	Valladolid		--	--	--
GPA	Araxos/Patras		--	--	--
KEM	Kemi-Tornio		--	--	--
KIT	Kithira		--	--	--
CND	Constanta		--	--	--
NAL	Nalchik		--	--	--
MZH	Amasya		--	--	--
DLE	Dole		--	--	--
SVL	Savonlinna		--	--	--
BJZ	Badajoz		--	--	--
YKO	Yüksekova		--	--	--
BGG	Bingöl		--	--	--
KFS	Kastamonu		--	--	--
SNR	Saint-Nazaire		--	--	--
KLV	Karlovy Vary		--	--	--
LEN	Leon		--	--	--
NRK	Norrköping		--	--	--
ANE	Marce		--	--	--
KZS	Kastelorizo		--	--	--
KTT	Kittilä		--	--	--
NOP	Sinop		--	--	--

AIRPORT		HUB CONNECTIVITY			
IATA code		Absolute 2016	Growth 2016 vs. 2015	Growth 2016 vs. 2008	Growth 2016 vs. 2006
ISE	Süleyman Demirel-Isp		--	--	--
KSF	Kassel		--	--	--
KSO	Kastoria		--	--	--
RJL	Logroño		--	--	--
JSY	Syros Island		--	--	--
SKU	Skiros		--	--	--
KAO	Kuusamo		--	--	--
SUJ	Satu Mare		--	--	--
KCO	Kocaeli		--	--	--
OHD	Ohrid		--	--	--
VOL	Volos		--	--	--
KZI	Kozani		--	--	--
TJK	Tokat		--	--	--
INI	Nis		--	--	--
PDV	Plovdiv		--	--	--
GNB	Grenoble		--	--	--
BWK	Brač		--	--	--
CMF	Chambery		--	--	--
AVN	Avignon		--	--	--
CHR	Chateroux		--	--	--
EPL	Vosges		--	--	--
PED	Pardubice		--	--	--
SIR	Sion		--	--	--

Airports for which no data is reported have had no hub connectivity since 2006.

Appendix I NetScan methodology



The connectivity performance offered from an airport (airport connectivity) is made up of all connections offered from the airport either direct or indirect via an intermediate hub. Hub connectivity represents the connectivity offered via (with a transfer at) the airport.

Traditionally, connectivity is represented by the number of destinations or the number of direct flights offered from an airport. Although valuable in itself, this does not provide insight into the indirect and hub connectivity provided by the airports. The SEO NetScan connectivity model follows a more comprehensive approach and takes all three types of connectivity into account.

The NetScan model first identifies all direct and indirect (one-stop) connections available on an airport-pair. The model uses OAG passenger flight schedule data on direct flights as input. The flight schedules for the third week of June are used. Indirect connections are created within the model by connecting two direct flights taking into account minimum and maximum connecting times. Indirect connections are possible at any given airport between:

- flights of the same airline;
- flights of airlines working together in an alliance or through a codeshare agreement. The alliance and codeshare compositions are specified for the specific year of analysis.

As indirect connections are less attractive to the passenger than direct connections, due to the transfer and circuity time involved, each connection is weighted for its quality. The quality of a connection ranges between zero and one. A direct, non-stop flight operated by a jet aircraft is given the maximum quality of one. The quality of an indirect connection will always be lower than one since travel time is added due to transfer time and circuity time. The same holds true for a direct multi-stop connection or a direct connection operated by a turboprop: passengers face a lower network quality because of a longer travel time. Connections with a too long travel time relative to the theoretical direct flight time will be assigned a quality of 0. As such, these connections are considered to be unrealistic travel options for the passenger. Box 1 shows how the quality of individual connections is determined.

The quality of each connection is calculated as follows:

Box 1 **Determining the quality of individual connections**

First the maximum allowable perceived travel time is calculated. The maximum allowable perceived travel time $t_{x(h)y}^{perceived,\max}$ between airports X and Y depends upon the non-stop flight time between both airports $t_{xy}^{flight,non-stop}$ and a factor which decreases with distance. The non-stop flight time is determined by the geographical coordinates of origin and destination airport and the flight speed of an average jet aircraft taking into account the time needed for take-off and landing. Over longer distances passengers are willing to accept longer transfer and ciruity times. Therefore the maximum allowable travel time also depends on a factor which decreases with distance: the further apart two airports are, the longer the maximum perceived travel time will be. For example, when the direct flight time between two airports is one hour, the maximum allowable perceived travel time will be about three hours, whereas this will be 24 hours for airports which are 12 hours apart by direct flight.

$$t_{xy}^{perceived,\max} = t_{xy}^{flight,non-stop} + 5 * \log(t_{xy}^{flight,non-stop} + 0.5)$$

Second the actual perceived travel time is determined. For direct connections, the actual perceived travel time between airports X and Y $t_{x(h)y}^{perceived,actual}$ equals the actual flight time. $t_{xy}^{flight,actual}$ For indirect flights the perceived travel time equals the flight times on both flight legs and the transfer time at hub H. $t_h^{transfer}$ As transfer time is considered more uncomfortable than flight time, the transfer time is penalized by a factor which decreases with distance: p_{xy}

$$t_{x(h)y}^{perceived,actual} = \begin{cases} t_{xy}^{flight,actual} & for\ direct\ flights \\ (t_{xh}^{flight,actual} + t_{hy}^{flight,actual}) + p_{xy} * t_h^{transfer} & for\ indirect\ flights \end{cases}$$

If the actual flight time is smaller than or equal to the average non-stop flight time, then the weight of the connection $q_{x(h)ya}$ equals one. In practice, this is only the case on direct flights operated by aircraft that are at least equally fast as the average jet aircraft on which the non-stop flight time is based. When the perceived travel time becomes larger than the maximum allowable perceived travel time, then the weight of the connection is zero and the connection will be considered unviable. In any other case, the perceived travel time lies between the non-stop flight time and the maximum allowable perceived flight time. In these cases, the weight of the connection depends on the relative difference between the perceived and maximum allowable travel time.

$$q_{x(h)y} = \begin{cases} 1 & if\ t_{x(h)y}^{perceived,actual} <= t_{xy}^{flight,non-stop} \\ 1 - \dfrac{t_{x(h)y}^{perceived,actual} - t_{xy}^{flight,non-stop}}{t_{xy}^{perceived,\max} - t_{xy}^{flight,non-stop}} & if\ t_{xy}^{flight,non-stop} < t_{x(h)y}^{perceived,actual} < t_{xy}^{perceived,\max} \\ 0 & if\ t_{x(h)y}^{perceived,actual} => t_{xy}^{perceived,\max} \end{cases}$$

When the perceived travel time is relatively small compared to the maximum allowable travel time, then the weight of the connection will be high and vice versa. The connectivity $CNU_{x(h)ya}$ of an individual direct or indirect connection equals its quality. $q_{x(h)ya}$

$CNU_{x(h)ya} = q_{x(h)ya}$ The CNU is calculated for each individual direct and indirect connection. This means that when a flight is offered with a daily frequency, the CNU's for each of these seven flights as well as for each possible connection have been calculated. The reason for distinguishing between individual flights is twofold. First, the flights might be carried out by different airplane types during the week leading to different flight times and therefore differing CNU's. Second, the same flight might connect to different flights on for example a Monday than on a Friday.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Connectivity is the metric by which airports live – the more connected an airport is to the wider world, the more attractive it becomes to its users and the greater the value it provides to the community and local, regional or indeed national economy it serves.

Globalisation has prompted burgeoning interest in measuring the connectivity of hub airports and other airports offering point-to-point services. With airport competition now a firm reality for European airports big and small, connectivity is shifting, changing each year.

In 2014, ACI EUROPE partnered with SEO Aviation Economics to produce the first ever industry-wide analysis of airport connectivity. That report measured direct and indirect connectivity between 2004 and 2014 and contained analysis based on SEO's NetScan connectivity methodology. This report is the third edition, measuring direct, indirect and hub connectivity including 2016 data and containing analysis based on SEO's NetScan connectivity methodology.

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