EAMONN BRENNAN

Interview
with EUROCONTROL's
Director General

HERMES
AIR TRANSPORT ORGANISATION
THE MAGAZINE

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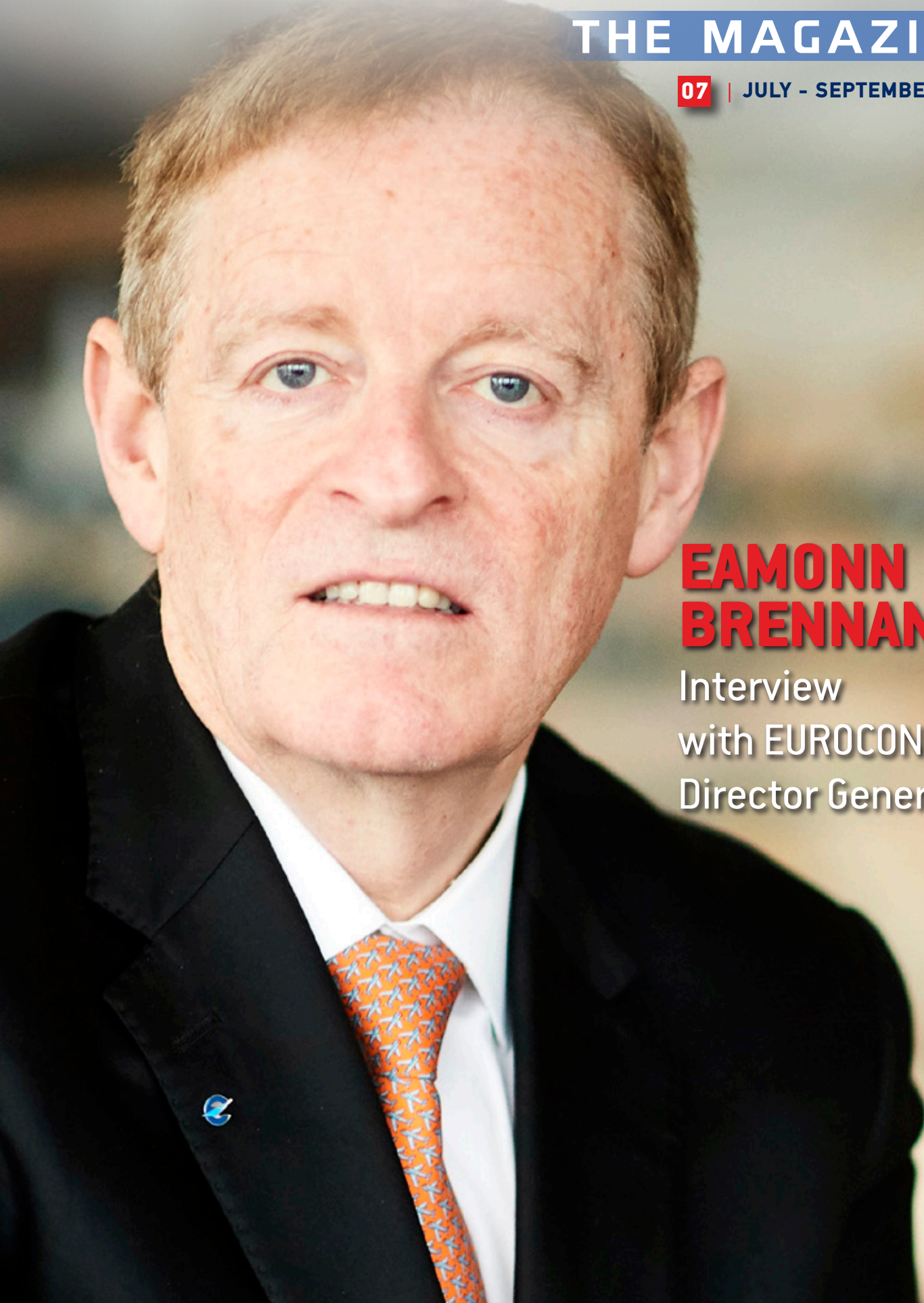
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EDITORIAL

Dr Kostas Iatrou
Director General
Hermes - Air Transport Organisation

Dear Hermes members,

I am pleased to welcome you to the latest issue of The Magazine. Hermes participated in the 40th ICAO Assembly as observer and submitted two information papers, one on «Education and Performance in Aviation» and the other on «Regulatory Environment for a Successful Airline Industry».

During September, Hermes signed two landmark MoUs of cooperation with IATA and EUROCONTROL, thus firther expanding the list of aviation organisations linked to our organisation.

On 17th September in a ceremony organised by Ecali Club to celebrate the unique success of «Brands with History" iniitiative Hermes received an award. In this issue we have the pleasure to host an interview with Eamonn Brennan.

Finally, Hermes has launched the topic for the 2020 recommendations namely «Digitalisation and AI in aviation — the human factor".

1/7/2019

BOEING TAKES NEW TECHNOLOGIES OUT OF THE LAB AND ONTO ECODEMONSTRATOR FLYING TEST BED

Boeing [NYSE:BA] is launching its latest round of flight-testing to assess new technologies that could address real-world challenges for airplane operators and passengers — from enhancing safety and sustainability to improving the flying experience. The company is debuting a Boeing 777 that will serve as the 2019 flying test bed for 50 projects.

Source: Boeing

1/7/2019

KLM'S FIRST BOEING 787-10 DREAMLINER

The new Boeing 787-10 Dreamliner, "Oranjebloesem" (Orange Blossom) registration PH-BKA, was delivered on Sunday. It was greeted at Schiphol with a water salute.
KLM is the first European airline to operate this more sustainable and economical aircraft. The Boeing 787-10 Dreamliner has the same efficient engines as the 787-9. The combination of these engines with the use of lighter materials in the 787-10 means it produces lower carbon emissions and less noise.

Source: KLM

10/07/2019

IATA AND ATA JOIN FORCES TO IMPLEMENT CEIV LIVE ANIMALS

The International Air Transport Association (IATA) and the Animal Transport Association (ATA) have joined forces to encourage industry adoption of the Center of Excellence for Independent Validators for Live Animals Logistics (CEIV Live Animals).

24/07/2019

BOEING REPORTS SECOND-QUARTER RESULTS 2019

-Continue to engage global regulators and customers on safe return to service of the 737 MAX
-Recorded charge and increased costs related to the 737 MAX, as previously announced
-Revenue of $15.8 billionreflecting 737 MAX impacts and higher defense and services volume

Source: Star Alliance

23/07/2019

JAPAN AIRLINES BECOMES SUPPORTING PARTNER OF TOKYO 2020 OLYMPIC TORCH RELAY

Japan Airlines Co., Ltd. (JAL) today signed a "Supporting Partner" Agreement for the Tokyo 2020 Olympic Torch Relay (hereinafter "Partnership Agreement") with the Tokyo Organising Committee of the Olympic and Paralympic Games.
As a Supporting Partner, JAL will strengthen communications of Tokyo 2020 and the Olympic Torch Relay in a broad range of customer touchpoints, such as at the airport, in-flight, JAL website, SNS, and at regional events across Japan, which will help foster the Olympic Movement.
JAL will promote the Tokyo 2020 Olympic Torch Relay and work to build domestic excitement for the Olympic Games Tokyo 2020, which is set to begin one year from now.
In addition, JAL will be working with All Nippon Airways Co., Ltd. to transport the Olympic flame from Greece to Japan.

26/07/2019

STAR ALLIANCE AND NEC CORPORATION SIGN PARTNERSHIP AGREEMENT TO ENHANCE PASSENGER EXPERIENCE THROUGH BIOMETRIC DATA RECOGNITION TECHNOLOGY

Star Alliance, the world's largest airline alliance, and NEC Corporation, global leader in IT, network and biometric technologies, today signed a partnership agreement to develop a biometric data-based identification platform that will significantly improve the travel experience for frequent flyer programme customers of Star Alliance member airlines.

29/07/2019

EUROPEAN COMMISSION STRENGTHENS AVIATION SAFETY COOPERATION WITH JAPAN

The European Commission and Japan have today agreed to strengthen their aviation cooperation by concluding negotiations on an agreement on civil aviation safety that will enhance safety cooperation and facilitate market access of the EU's aeronautical sector. The agreement is a deliverable under the Commission's Aviation Strategy for Europe.

29/07/2019

BRITISH AIRWAYS TAKES DELIVERY OF ITS FIRST A350-1000

British Airways (BA) has taken delivery of its first A350-1000 at Airbus headquarters in Toulouse, France, making it the first operator of the larger A350-1000 in International Airlines Group (IAG). In total, BA has ordered 18 A350-1000s. Iberia, which is also part of IAG, already operates five of the smaller A350-900s.

Source: Airbus

2/08/2019

ACI WORLD AND FLIGHT SAFETY FOUNDATION SIGN NEW MEMORANDUM OF COOPERATION

Airports Council International (ACI) World and Flight Safety Foundation (FSF) have signed a Memorandum of Cooperation (MoC) that allows for enhanced collaboration.

Safety continues to be the number one priority for airports, the aviation community and the travelling public and the MoC will allow ACI and FSF to share relevant safety information and materials and to collaborate on a number of different initiatives, including:

- participation in each other's safety committees
- publicizing the planned 2020 implementation of the International Civil Aviation Organization's (ICAO) Global Reporting Format methodology for assessing and reporting of runway surface conditions
- supporting efforts to improve the delivery of safety information to air crews so it can be more easily understood and prioritized, and
- ensuring ongoing cooperation with regard to the ICAO Global Aviation Safety Plan (GASP) and Global Air Navigation Plan (GANP).

7/08/2019

ACI WORLD LAUNCHES RESILIENCE AND ADAPTATION TO CLIMATE CHANGE SURVEY

Airports Council International (ACI) World has launched an online initiative to assist the airport industry in sharing relevant information to help improve resilience and business continuity in the face of more frequent adverse weather events as a result of climate change.

ACI World's Resilience and Adaptation to Climate Change Survey was launched in the wake of weather events such as Typhoon Jebi which resulted in the flooding and temporary closure pf Kansai Airport in September 2018.

The results of the survey will provide an understanding of the impacts and potential risks of climate change already faced by the airports industry. Identifying the current status of the industry provides a basis to define future action and preparedness.

The results will also underpin advocacy by ACI and the industry for the interests of airports to national and international regulatory bodies and stakeholders by providing a solid base of data and evidence.

19/08/2019

HAHN AIR INTRODUCES NDC PLATFORM AND ISSUES FIRST NDC TICKET

The market leader in airline distribution, Hahn Air, unveiled its new NDC platform. The company is extending its suite of products for partner airlines and travel agencies with a solution powered by IATA's New Distribution Capability (NDC) standard. To mark the occasion, the German airline and ticketing expert welcomed the first passengers holding NDC-enabled Hahn Air tickets on one of its scheduled flights from Luxembourg to Dusseldorf on 16th August 2019.

12/08/2019

STEPHEN M. DICKSON SWORN IN AS ADMINISTRATOR OF THE FEDERAL AVIATION ADMINISTRATION

Stephen M. Dickson was sworn in today by U.S. Transportation Secretary Elaine L. Chao as the 18th Administrator of the Federal Aviation Administration (FAA). An aviation industry professional with nearly 40 years of experience, Dickson is widely respected and assumes the role of Administrator of the agency during a critical moment for aviation safety.

Source: FAA

20/08/2019

EFFICIENCY AND COORDINATION KEY TO ADDRESSING ASIA-PACIFIC CAPACITY CRUNCH

Airports Council International (ACI) World today called for improved coordination among industry stakeholders to increase capacity in the Asia-Pacific Region, home to some of the fastest growing economies and aviation markets.

Speaking at the 56th Conference of Directors General of Civil Aviation, Asia and Pacific Region, ACI Director General addressed the three necessary pillars of improving capacity: using what we have efficiently, protecting the use of what we have, and developing more when necessary, and, underlined their importance to safeguarding the socio-economic benefits that aviation provides to the region at large.

20/08/2019

COMMON APPROACH CRUCIAL TO SOLVING ASIA-PACIFIC'S CAPACITY CONSTRAINTS

The stage has been set for progress toward the resolution of Asia-Pacific's aviation capacity constraints at the 56th Conference of Directors General of Civil Aviation, Asia and Pacific Region (DGCA-APAC/56) in Kathmandu, with ICAO Council President Dr. Olumuyiwa Benard Aliu stressing the pivotal importance of cooperation towards ICAO compliance as the only sustainable solution to the challenges faced by region's States.

Source: ICAO

11/09/2019

EU AVIATION STAKEHOLDERS SIGN JOINT DECLARATION ON THE FUTURE OF THE SINGLE EUROPEAN SKY

The signatories call on the EU Institutions and Members States to take the necessary steps to implement the joint declaration adopted today, outlining their shared commitment to improving Europe's airspace.

At the "Digital European Sky" conference, organised under the Finnish Presidency of the EU, representatives of 21 EU aviation and workers associations will sign a joint declaration committing to a set of concrete actions to finally and fully implement the vision of a Single European Sky (SES).

The joint declaration that will be signed today by A6 Alliance, A4 Airline Grouping, A4E, AIRE, ACI EUROPE, ASD, ATCEUC, Borealis Alliance, B4, CANSO, COOPANS, Drone Alliance Europe, EBAA, EHA, ERA, Gate One, IATA, IFATCA, IFATSEA and IAOPA sends a strong signal that the SES vision can only be achieved through the collaborative and coordinated efforts of all stakeholders, including Member States and the European Institutions.

11/09/2019

AIRBUS COMMENCES IN-FLIGHT TRIALS OF CONNECTED CABIN TECHNOLOGIES

Airbus has commenced in-flight trials of **IoT*** connected cabin technologies on board an A350-900 Flight Lab aircraft – to be shortly revealed to customers. In doing so, Airbus becomes the first aircraft manufacturer to undertake such flight-testing of actual connected cabin innovations.

*IoT = "Internet of Things"

Source: AIRBUS

12/09/2019

ACI WORLD RELAUNCHES TRANSFORMATIVE AIRPORT SMART SECURITY PROGRAMME

Airports Council International (ACI) World has relaunched its transformative Smart Security programme which aims to improve passenger and cabin baggage screening at airports worldwide. In light of ACI forecasts that demand for air services will double by 2034, the world's airports are taking action now to prepare to meet this demand by improving security, efficiency and facilitation across the entire passenger journey.

The relaunched Smart Security programme, led by ACI, forms an integral part of this global effort by bringing together innovation and collaboration between global airports, regulators and airlines.

16/09/2019

ACI WORLD AIRPORT TRAFFIC REPORT SHOWS PASSENGER GROWTH RESILIENCE DESPITE GLOBAL UNCERTAINTY

According to Airports Council International (ACI) World's latest World Airport Traffic Report published today, passenger numbers are estimated to have reached 8.8 billion in 2018, an increase of +6.4% compared to the previous year.

In addition, the world's airports accommodated 122.7 million metric tonnes of cargo and almost 100 million aircraft movements.

While growth moderated slightly compared to 2017, passenger traffic remained resilient in the face of the global uncertainties affecting many major economies. The 2018 increase is still above the +5.8% compounded average annual growth rate for passenger traffic from 2010 through 2018.

While advanced economies held the largest proportion (52.8%) of global passenger traffic, airport traffic in emerging markets and developing economies grew faster (+8.3%) than in advanced economies (+4.8%) in 2018. During 2018, the highest number of passengers travelled through airports in the Asia-Pacific region:

1. Asia-Pacific (3.3 billion, +8.1%)
2. Europe (2.4 billion, +6.4%)
3. North America (2 billion, +5.0%)
4. Latin America-Caribbean (651 million, +5.0%)
5. Middle East (396 million, +0.7%)
6. Africa (214 million, +9.4%).

17/09/2019

AIRPORTS COUNCIL INTERNATIONAL (ACI) WORLD AND AIRPORTS COUNCIL INTERNATIONAL (ACI) WORLD'S LATEST WORLD AIRPORT TRAFFIC REPORT HAS REVEALED THE TOP AIRPORTS FOR PASSENGERS, CARGO AND AIRCRAFT MOVEMENTS AND HIGHLIGHTED THE WORLD'S FASTEST GROWING AIRPORTS FOR 2018

The report found that, in total, the world's airports accommodated 8.8 billion passengers, 122.7 million metric tonnes of cargo, and 99.9 million aircraft movements.

The world's top three airports for passenger traffic volume – Hartsfield-Jackson Atlanta International Airport, Beijing Capital International Airport, and Dubai International Airport respectively – have held their positions while Los Angeles International Airport (fourth) and Tokyo International Airport (fifth) have *(cont.'d ▶)*

Fastest-growing airports (more than 15 million passengers)			
Rank	Airport	Passengers	% Change
1	Bangalore Airport, India	32,331,783	29.1
2	Antalya Airport, Turkey	31,953,777	22.1
3	Hyderabad Airport, India	20,903,930	21.9
4	Vnukovo Airport, Russian Federation	21,478,486	18.4
5	Jinan Airport, China	16,661,795	16.0

Fastest-growing airports (handling over 250,000 metric tonnes of air cargo)			
Rank	Airport	Cargo	% Change
1	Rockford Airport, USA	306,332	56.6
2	Nairobi Airport, Kenya	342,579	25.2
3	Liege Airport, Belgium	871,596	21.6
4	Xi'An Airport, China	312,639	20.3
5	Philadelphia Airport, USA	503,766	20.0

17/09/2019

(cont.'d ▶) **AIRPORTS COUNCIL INTERNATIONAL (ACI) WORLD AND AIRPORTS COUNCIL INTERNATIONAL (ACI) WORLD'S LATEST WORLD AIRPORT TRAFFIC REPORT HAS REVEALED THE TOP AIRPORTS FOR PASSENGERS, CARGO AND AIRCRAFT MOVEMENTS AND HIGHLIGHTED THE WORLD'S FASTEST GROWING AIRPORTS FOR 2018**

swapped places in the top five from last year. The full list of top airports for passenger traffic, cargo, and aircraft movements is as follows:

Rank 2018	Rank 2017	Airport City / Country / Code	Passengers (Enplaning and deplaning)	% Change
1	1	Atlanta GA, US (ATL)	107,394,029	3.3
2	2	Beijing, CN (PEK)	100,983,290	5.4
3	3	Dubai, AE (DXB)	89,149,387	1.0
4	5	Los Angeles CA, US (LAX)	87,534,384	3.5
5	4	Tokyo, JP (HND)	86,942,794	4.4
6	6	Chicago IL, US (ORD)	83,245,472	4.3
7	7	London, GB (LHR)	80,126,320	2.7
8	8	Hong Kong, HK (HKG)	74,515,927	2.6
9	9	Shanghai, CN (PVG)	74,006,331	5.7
10	10	Paris, FR (CDG)	72,229,723	4.0
11	11	Amsterdam, NL (AMS)	71,053,147	3.7
12	16	New Delhi, IN (DEL)	69,900,938	10.2
13	13	Guangzhou, CN (CAN)	69,743,211	5.9
14	14	Frankfurt, DE (FRA)	69,510,269	7.8
15	12	Dallas/Fort Worth TX, US (DFW)	69,112,607	3.0
16	15	Istanbul, TR (ISL)	68,360,648	6.6
17	19	Incheon, KR (ICN)	68,350,784	10.0
18	17	Jakarta, ID (CGK)	65,667,595	4.2
19	18	Singapore, SG (SIN)	65,628,000	5.5
20	20	Denver CO, US (DEN)	64,494,613	5.1
		TOTAL	1,537,949,380	4.8

Rank 2018	Rank 2017	Airport City / Country or Area / Code	Cargo (Metric tonnes) (Loaded and unloaded)	% Change
1	1	Hong Kong, HK (HKG)	5,121,029	1.5
2	2	Memphis TN, US (MEM)	4,470,196	3.1
3	3	Shanghai, CN (PVG)	3,768,573	-1.5
4	4	Incheon, KR (ICN)	2,952,123	1.0
5	5	Anchorage AK, US (ANC)	2,806,743	3.5
6	6	Dubai, AE (DXB)	2,641,383	-0.5
7	7	Louisville KY, US (SDF)	2,623,019	0.8
8	9	Taipei, Chinese Taipei (TPE)	2,322,823	2.4
9	8	Tokyo, JP (NRT)	2,261,008	-3.2
10	13	Los Angeles CA, US (LAX)	2,209,850	2.4
11	16	Doha, QA (DOH)	2,198,308	8.8
12	12	Singapore, SG (SIN)	2,195,000	1.4
13	11	Frankfurt, DE (FRA)	2,176,387	-0.8
14	10	Paris, FR (CDG)	2,156,327	-1.8
15	14	Miami FL, US (MIA)	2,129,658	2.8
16	15	Beijing, CN (PEK)	2,074,005	2.2
17	18	Guangzhou, CN (CAN)	1,890,816	6.2
18	20	Chicago IL, US (ORD)	1,807,091	5.0
19	17	London, GB (LHR)	1,771,342	-1.3
20	19	Amsterdam, NL (AMS)	1,737,964	-2.7
		TOTAL	51,313,665	1.4

Rank 2018	Rank 2017	Airport City / Country / Code	Movements (Take-off and landing)	% Change
1	2	Chicago IL, US (ORD)	903,747	4.2
2	1	Atlanta GA, US (ATL)	895,682	1.8
3	3	Los Angeles CA, US (LAX)	707,833	1.1
4	4	Dallas/Fort Worth TX, US (DFW)	667,213	2.0
5	5	Beijing, CN (PEK)	614,022	2.8
6	6	Denver CO, US (DEN)	595,190	3.5
7	7	Charlotte NC, US (CLT)	550,013	0.4
8	8	Las Vegas NV, US (LAS)	539,857	-0.6
9	9	Amsterdam, NL (AMS)	517,737	0.7
10	13	Frankfurt, DE (FRA)	512,115	7.7
11	10	Shanghai, CN (PVG)	504,794	1.6
12	11	Paris, FR (CDG)	488,092	1.1
13	21	New Delhi, IN (DEL)	480,707	7.3
14	12	London, GB (LHR)	477,769	0.4
15	15	Guangzhou, CN (CAN)	477,364	2.6
16	14	Toronto ON, CA (YYZ)	474,289	1.9
17	17	San Francisco CA, US (SFO)	470,164	2.1
18	19	Houston TX, US (IAH)	466,738	3.6
19	16	Istanbul, TR (ISL)	464,646	0.8
20	22	Jakarta, ID (CGK)	463,069	3.5
		TOTAL	11,271,041	2.4

19/09/2019

SAS PRESENTS NEW LIVERY

For the first time in 21 years, SAS has launched a brand new visual identity and revealed a new design for its aircraft exterior. The new livery is a modern take on classic Scandinavian design, and to highlight the future of SAS, the new Airbus A350 and A320neo, the market's most modern and fuel-efficient aircraft, will be the first to feature the new design.

Source: SAS

23/09/2019

IATA LAUNCHES SOLUTION TO COSTLY AIRLINE PARTS CHALLENGES

The International Air Transport Association (IATA) announced the launch of IATA MRO SmartHub, an online tool that brings much needed transparency to the market for aircraft components and parts. It will enable subscribing airlines and maintenance, repair and overhaul (MRO) providers to transparently list items to buy or sell on the new platform and will reduce over-payments by making the assessment of fair market value (FMV) more accurate.

The total MRO market is estimated to be $81.9 billion annually, a significant portion of which is attributed to material costs. IATA MRO SmartHub is expected to shave 10-15% of these material costs through efficiency gains in the supply chain and more accurate assessments of FMV. Additionally, the IATA MRO SmartHub will:

- Enable the accurate valuation of parts inventories at any point in time
- Increase confidence in planning, procuring or selling aircraft components and parts
- Allow better-informed decisions on which aircraft components and parts to procure and use
- Enhance trust in buyer/vendor relationships

26/09/2019

IATA LAUNCHES GENDER DIVERSITY CAMPAIGN

The International Air Transport Association (IATA) today launched the 25by2025Campaign—an airline industry initiative to advance gender diversity in the airline industry by 2025.

The 25by2025 Campaign is a voluntary commitment by participating IATA member airlines. Key among the commitments of airlines participating in the 25by2025 Campaign are:

- Increasing the number of women in senior positions (to be defined by the member airlines) by either 25% against currently reported metrics or to minimum representation of 25% by 2025
- Increasing the number of women in under-represented jobs (e.g. pilots and operations) by either 25% against currently reported metrics or to a minimum representation of 25% by 2025
- Reporting annually on key diversity metrics

23/09/2019

THOMAS COOK HAS CONFIRMED THAT ALL THE COMPANIES IN ITS GROUP HAVE CEASED TRADING, INCLUDING THOMAS COOK AIRLINES

24/09/2019

ERA STRENGTHENS LONG-STANDING RELATIONSHIP WITH FLIGHT SAFETY FOUNDATION

Recognising the power of collective action, ERA and Flight Safety Foundation have officially announced their signing of a Memorandum of Co-operation. Committed to closer working relations, the organisations will explore and identify areas of common interest in the field of aviation safety, benefiting both the association and foundation's members and their key stakeholders, including regulators, passengers and shareholders. The two organisations have agreed to exchange relevant safety information and share materials, as well as consider working together on initiatives addressing pilot and engineering skills shortages. The co-operation will also aim to strengthen the efforts in addressing emerging issues that have resulted from the continued growth and expansion of the air transport industry in Europe, including the complexities associated with limited airspace and FIR boundary challenges.

27/09/2019

DELTA AND LATAM AIRLINES TO FORM THE LEADING AIRLINE PARTNERSHIP THROUGHOUT THE AMERICAS

- Partnership brings together the leading airlines in North America and Latin America, connecting the Americas to the world as never before.
- Together, Delta and LATAM will hold the leading position in five of the top six Latin American markets from the U.S.
- Together, the partners will serve 435 destinations worldwide and carry more passengers between North America and Latin America than any other partnership.
- Customers will benefit from significantly expanded travel choices across the Americas and an industry leading customer experience.

28/09/2018

ICAO'S NO COUNTRY LEFT BEHIND INITIATIVE SUCCESSFULLY DELIVERED A SAFER AND MORE SECURE GLOBAL FLIGHT NETWORK

The success of ICAO's efforts to improve the safety, security, and sustainability of the international civil aviation network is being highlighted by ICAO's Member States at the UN agency's 40th Assembly.

Through its No Country Left Behind (NCLB) initiative, ICAO is working to raise global awareness on the importance of the effective implementation of ICAO standards and recommended practices (SARPs), policies, plans and programmes. Many of these form the basis of States responsibilities to one another under the 1944 Convention on International Civil Aviation, and they underpin the development and modernization of the global air transport system.

30/09/2018

ACI AND CANSO CALL FOR A NEW APPROACH TO COMMUNITY ENGAGEMENT ON NOISE

Airports Council International (ACI) World and the Civil Air Navigation Services Organisation (CANSO) have today presented a paper to the 40th International Civil Aviation Organization (ICAO) Assembly on the crucial issue of how the industry manages the impact of noise.

ACI and CANSO have proposed that ICAO formally recognizes community engagement as an integral part of the ICAO Balanced Approach to Aircraft Noise considering its relevance and effectiveness in identifying practical solutions which include community feedback.

Hermes Participated at the Digital European Sky Conference

Hermes participated at the **European Commission's Digital European Sky conference**, organised together with the Finnish Presidency in Brussels (11-12 September).

The conference stimulated exchange of views between high-level representatives from the aviation sector on how to ensure that a safe, sustainable European ATM system delivers efficiently capacity that responds more flexibly to demand.

Hermes officially was represented by **Dr Kostas Iatrou**, *Director General,* but many members of Hermes participated in the conference and in the panel sessions including **Henrik Hololei**, *DG Move of the European Commission* and *Hermes Board Member*, **Olivier Jankovec**, *Director General of ACI Europe*, **Eamonn**

Brennan, *Director General of EUROCONTROL*, **Athar Husain Khan**, *Director General of EBAA* and **Mario Nemeth**, *Director General of Civil Aviation of Slovakia.*

At the opening of the conference a joint stakeholder declaration was signed committing to finally and fully implementing the Single European Sky.

Brands with History Award

Inspired by the long history of EKALI SA since 1924 and The Ecali Club since 1971 in the fields of hospitality, culture, sports and long-term social and professional relationships, decided to highlight the values of the creation and the development of Ecali Club Brand, which consist at the same time the compass for Ecali Club future.

Ecali Club goal is to honour timeless and prominent companies with their own unique story. The companies that have a long-standing market leadership are those that are built on a stable basis, implement strategic goals while respecting their history and serving the values of their founders. Ecali Club honoured prominent Brands and their representatives to the "Brands With History" Volume 2 ceremony, on Tuesday, September 17th 2019. Hermes – Air Transport Organisation was among the companies that received an award.

Jeff Poole, *President of Hermes* accepted the award on behalf of the organisation.

In his address Mr Poole said: "*I am delighted that this Award recognises Hermes as an established and notable brand in aviation history. Hermes is a relatively young association but already has official Observer status at the International Civil Aviation Organisation and formal partnership arrangements with key air transport associations and bodies.*

Hermes is a unique association in aviation because its Members are notable individual leaders rather than companies and organisations. As aviation will be at the forefront of technological change through digitalisation and artificial intelligence (AI), the human aspects become even more significant and challenging.

Through addressing these challenges proactively, Hermes will continue to grow its relevance, leadership and contribution to the air transport sector and hence the Hermes brand will also continue to grow from strength to strength."

4th Annual Plane Pull Fundraiser – Athens International Airport

Athens International Airport (AIA) hosted its 4th annual Plane Pull fundraiser on September 18, as part of its corporate social responsibility program with proceeds going towards the needs of the non-profit child welfare organization, the Smile of the Child (Hamogelo tou Paidiou).

Jeff Poole, *President of Hermes, presented the award to the most enthusiastic team: Greek Tourism Confederation (SETE).*

Memorandum of Understanding Between EUROCONTROL & HERMES

HERMES —Air Transport Organisation and EUROCONTROL are proud to announce the signature of a Memorandum of Understanding (MoU) on 24 September 2019. HERMES aims to provide a worldwide forum for networking and exchange of ideas among its members and to contribute to the development, progress and promotion of air transport at a global level.

Eamonn Brennan, EUROCONTROL's Director General said, *"I am very pleased to support HERMES and its* goals. *This MoU will facilitate the exchange of ideas and information, which will enable both organisations to support all the stakeholders in the air transport supply chain."*

Dr Kostas Iatrou, Director General of HERMES, said *"We are really honoured to have EUROCONTROL on board. The MoU will allow closer collaboration between the two organisations".*

IATA & Hermes sign a Memorandum of Understanding to Deepen their Cooperation

On 26 September 2019 IATA and Hermes signed a Memorandum of Understanding to deepen their cooperation. *"Hermes and IATA share some important common goals. We both want to support the sustainable growth of aviation. And we are both encourage a thorough examination of aviation's top issues with the benefit of input from multiple stakeholders.*

Today's MoU sets an enhanced framework for IATA and Hermes to work together," said **Alexandre de Juniac**, IATA's Director General and CEO.

"I am delighted to sign this MoU with IATA. This agreement deepens our relationship. IATA already has contributed actively in our recommendations" added **Dr Kostas Iatrou**.

40th ICAO Assembly

Hermes participated as an observer in the 40th ICAO Assembly (24 Sep – 4 Oct) held in Montreal. Dr Kostas Iatrou, Director General and Luis Felipe de Oliveira represented the organisation. Hermes presented two information papers based on its recommendations:

EDUCATION AND PERFORMANCE IN AVIATION: REALISING AND SUSTAINING BENEFITS

The WP highlights education and training as an investment, outlines the challenges faced by the aviation industry in recruiting and retaining personnel, and provides recommended actions that may be undertaken to improve training and educational strategy in aviation.

The WP was included in the report of the Executive Committee on Item 25 (ICAO Civil Aviation Training Policy and Capacity Building in Aviation):

REGULATORY ENVIRONMENT FOR A SUCCESSFUL AIRLINE INDUSTRY

The WP underscored the need for decision-makers to create an environment, including relaxing ownership and control restrictions, which will allow airlines to access the capital necessary for effective competitiveness. The paper explained that carriers pursuing cost leadership and/or revenue generation models extending beyond national boundaries would dominate the industry in the future.

The WP was included in the report of the Economic Committee on Item 32 (Economic Regulation of International Air Transport — Policy). During the 40th ICAO Assembly Hermes signed two Memorandum of Understandings with EUROCONTROL & with IATA.

Finally, Dr Iatrou had a series of meetings with key stakeholders -including ACAO, LACAC, AFCAC, FSF, AIA, IFALPA & IFATSEA- and presented the work of Hermes.

KLM Marks Centenary

Hangar 10 was the backdrop to the "KLM Experience", where guests were treated to an impressive overview of KLM's past, present and future. This included an in-depth look at KLM's development over the decades and the role it played in international civil aviation.

KLM'S 100TH DELFTWARE MINIATURE

In keeping with tradition, KLM marked its anniversary with the presentation of a new Delftware miniature house; a moment eagerly awaited by faithful collectors all over the world. This year's miniature is a replica of Huis ten Bosch Palace in The Hague, the home of King Willem-Alexander and his family. The first copy of KLM's 100th Delftware miniature house was presented to Finance Minister Wopke Hoestra by KLM President & CEO Pieter Elbers.

KLM BOOK

KLM will also mark its centenary with a special book titled Welcome Aboard — 100 years of KLM Royal Dutch Airlines. The first copy was presented by KLM's current Board of Managing Directors, Pieter Elbers, René de Groot and Erik Swelheim, to three former KLM presidents, Pieter Bouw, Leo van Wijk and Peter Hartman.

Jeff Poole, *President* & **Dr Kostas Iatrou,** *Director General* represented Hermes. In the photo together with **Pieter Elbers,** *KLM President & CEO* and *member of Hermes.*

HERMES

AIR TRANSPORT ORGANISATION

HERMES — AIR TRANSPORT ORGANISATION
IS LAUNCHING THE TOPIC FOR 2020 RECOMMENDATIONS

DIGITALIZATION, AI IN AVIATION AND THE HUMAN FACTOR

According to a White Paper prepared for the World Economic Forum, *"There is widespread recognition among industry leaders that the role of digital technology is rapidly shifting, from being a driver of marginal efficiency to an enabler of fundamental innovation and disruption."* The White Paper further notes that the aviation industry has been at the forefront of digital innovation, but that, *"further digitalization will be vital if the expectations of tomorrow's consumers are to be met."* Along the same lines, a working paper prepared by the Singapore delegation to ICAO's Thirteenth Air Navigation Conference notes, *"The growing pace of digital technological advancement provides opportunity to advance the global aviation industry, but is also a challenge that can disrupt the aviation industry."*

Digitalization promises to increase efficiency and safety in the aviation industry, as well as to improve the customer experience. Integration across physical and digital assets, *"will result in a seamless customer journey by making information available continuously, reducing waiting and transfer times, hyper-personalizing services and optimizing rerouting."* Increasing the digitalization of assets will further facilitate predictive maintenance, as information is communicated on a real-time basis to control centers outlining required safety checks and repairs.

Building on these digital advancements, artificial intelligence (AI) offers the opportunity to learn from experience: *"The differentiating factor of an AI system from a standard software system is the characteristic ability to learn, improve, and predict."* According to a recent report by McKinsey & Company. *"Machines powered by AI can today perform many tasks—such as recognizing complex patterns, synthesizing information, drawing conclusions, and forecasting—that not long ago were assumed to require human cognition... After decades of false starts, artificial intelligence is on the verge of a breakthrough... Tech giants and digital natives are investing in and deploying the technology at scale, but widespread adoption among less digitally mature sectors and companies is lagging."*

The pace of change in aviation from digitalization and AI is fast and accelerating, with almost every aspect being impacted — not just greater autonomy in the air in aircraft and other airspace vehicles and in air traffic management but also on the ground for operations, security and the passenger experience. Clearly, increased use of digitalization and AI in the aviation industry will disrupt the current workforce. Although, some jobs will be lost with workers replaced by technology, many more workers will need to be retrained to accommodate the new technologies: *"Digital transformation demands a different skill set from workers in today's economy, and will create new types of jobs... Challenges such as managing the impact of automation on employment, reskilling the industry workforce for the digital economy, and creating a safety net for workers in a flexible workforce, will need to be tackled collaboratively by industry, regulators and policy-makers."* In this context, Hermes invites interested stakeholders to submit papers on the following topics:

1. **WHAT CHANGES ARE NEEDED** to ensure that aviation proactively embraces digitalization and AI in a way that ensures continued safety, security and sustainability? Are current arrangements with ICAO (regulations, standards, etc) and industry associations (industry standards, benchmarking, sharing of best practices, etc) adequate or is there a need for more explicit leadership in aviation and, if so, by whom?

2. **WHAT POLICIES AND REGULATIONS NEED** to be instituted, altered or removed to ensure successful implementation of digitalization and AI in aviation? Is a performance-based approach to human involvement and to regulation sufficient or is there a need to be more prescriptive on when human involvement and management is essential?

3. **DIGITALIZATION AND AI WILL REDUCE THE COGNITIVE LOAD ON HUMANS** but will also have a significant impact on the need for human time and resources. How can aviation best anticipate and manage that impact? What changes are needed to recruitment, management, retention and retraining practices to ensure adequate and appropriate human resources that thrive in the aviation workplace?

1 World Economic Forum, *Digital Transformation Initiative Aviation, Travel and Tourism Industry*, White Paper, January 2017.

2 *Ibid.*

3 ICAO, Thirteenth Air Navigation Conference, Working Paper, AN-Conf/13-WP/232.

4 World Economic Forum, *op. cit.*

5 ICAO, Thirteenth Air Navigation Conference, *op. cit.*

6 McKinsey & Company, *Artificial Intelligence: The Next Digital Frontier?* Discussion Paper, June 2017.

7 World Economic Forum, *op cit.*

Italian Hipster smiles
at Athens International Airport
Ceramic, 2019 A.D.

THE ΛUTHENTIC SMILES

ATHENS
INTERNATIONAL AIRPORT
ELEFTHERIOS VENIZELOS

EAMONN BRENNAN

EUROCONTROL's Director General

EUROCONTROL

CURRENT CHALLENGES FACING EUROPEAN AVIATION AND THE IMPORTANCE OF DIGITALISATION

So Eamonn, what do you see are some of the key issues facing European aviation?

European airspace is among the busiest in the world, with over 37,000 flights on busy days and very high airport density. Inefficiencies in part of the network have resulted in a capacity issue today; at the same time, we know that the current fragmented airspace system won't be able handle future demand, it's just not scalable enough to meet business needs. Another challenge is that there are virtually no airports or runways being built in Europe and that's going to be a real constraint for Europe in the years ahead.

As we face up to the capacity issue, we also need to address aviation's carbon footprint. This is something that is top of the global agenda and a key focus under the Green Deal set out by incoming Commission President Ursula van der Leyen. We know we need to find ways to rapidly decarbonise the sector but it's a huge challenge for policy

What's EUROCONTROL's role in addressing this?

This year, the EUROCONTROL Network Manager, in collaboration with airlines, Air Navigation Service Providers (AN-SPs) and airports, engaged in a number of crisis management measures designed to alleviate the capacity issues and to minimise ATFM delays. We rerouted or level capped over 1,000 flights per day throughout the summer to help improve the situation. Fortunately, we had fewer ATC strikes this year and many of our ANSPs made local changes. Collectively we've seen a marginal improvement, but the delay situation is still twice as bad as it was in previous years; clearly, the system is structurally flawed. The current European ATM system will continue to be inefficient due to shortfalls in the way airspace, capacity and infrastructure is managed and the Wise Persons Group has recommended the need to strengthen the Network Manager in those three areas.

While we deal with the daily operational issues, we are also addressing many other areas. As a civil-military organisation, we're in an excellent position to ensure that the military is fully integrated and involved in the changes that need to be made to make best use of the airspace. We work closely with our Member States — all 41 of them — as well as our 2 Comprehensive Agreement States to ensure that each one is in a position to contribute to increasing Network capacity. With the environmental impact of aviation becoming an increasingly important issue across Europe, we are working in support of the European Commission and ICAO to develop the tools that are needed to implement or monitor requirements related to noise or emissions. A major

makers. So for me, one of the greatest issues we are facing in Europe is how we will reconcile the demand for air travel with the very legitimate requirement from citizens that we become more aggressive in addressing the environmental impact of aviation.

Some clear recommendations on how to address these challenges were made this year to the European Com-

mission by the "Wise Persons Group", of which I was a member. These included the need for managing European airspace as a real network, and also the implementation of a new Digital European Sky. In parallel, the Airspace Architecture study sets out how we can restructure the airspace to increase capacity and prepare for future technology. This is a really good blueprint for way forward.

contribution to managing our environmental footprint will of course come from deployment of new technology and here we've been very active for many years in the field of R&D, working closely with the SESAR partners to drive the technological changes that will be needed for our future systems. Digitalisation is of course a huge part of the changes that need to be made and we are very engaged on a number of levels, including working on cyber-security and connectivity as well as starting to look into how we can harness Artificial Intelligence for the benefit of the network as a whole.

What are the main benefits to the aviation industry of digital technology and a digitalization strategy?

Today we only exploit 10% of the data produced in the aviation business. This shows clearly that despite aviation being well developed technologically and in terms of automation, its digitalisation transformation has not really started.

There are four key features of the aviation industry that frame how it will adapt to digitalisation. Firstly, aviation is built on a unique, distributed and tightly inter-related ecosystem of stakeholders including the airlines, ANSPs, Airports, Aircraft manufacturers, ground handlers, airport security services. Secondly, the aviation sector is one of the most regulated sectors when it comes to safety. Thirdly, aviation operates in a global market with global air operations. Fourthly, technological evolution is limited by the long lifespan of aircraft and ATM systems.

When it does finally embrace digitalisation and AI, aviation will enter a new era, one in which it will be able to provide innovative services to its customers, while at the same time facing competition from new and more agile players. We have already seen this happening in the drone and U-Space services area where small companies have developed airborne vehicles and traffic management digital services much faster than traditional aviation and ATM businesses. Space based ADS-B data providers such as Aireon are now providing global Air Traffic surveillance solutions and competing for a digital air global market while other sectors such as autonomous cars are also developing fast and could become competitors in the aviation digital race, including traffic management services. Digital competition may not just come from inside but from big global digital players who see traditional ATM as a hindrance to their business development.

EUROCONTROL is fully committed to contribute to the Digital European Sky initiative recently launched by the European Commission under the Finnish

presidency. An example is EUROCONTROL's Maastricht Upper Area Control Centre (MUAC) which is already operating AI-based route predictions to reduce controller workload and subsequently increase capacity. Like us, most of our stakeholders are now engaging in AI, but these developments are still scattered. Developing a digital strategy for aviation is fundamental to enable the sector to move forward coherently, focusing on using technology to improve its business performance, creating new products, developing high performant processes, building new partnerships. By putting in place a shared approach, aviation will be able to become even more dynamic and responsive to the needs of society.

What are the main benefits to the aviation industry to employing artificial intelligence (AI)?

AI has tremendous potential to benefit aviation in a number of different areas. Already AI is being used to improve production line processes and detect defects while airlines aim to improve customer satisfaction, carry out predictive maintenance, and optimise their schedules.

As far as ATM is concerned AI offers a whole world of new opportunities in areas such as increasing flight predictability and sector capacities, reducing Air Traffic Controller workload, optimising use of scarce resources such as runways, helping to monitor system performance including cyber threat detection, enhancing customer experience.

Aviation today is faced with a major challenge — how can we respond to growing demand while at the same

time reducing the environmental footprint of aviation ? With two apparently contradictory requirements, we are in real need of a disruptive and fundamentally different approach — which AI has the potential to support if not lead.

What changes are needed to aviation operations to ensure that digitalization and AI strategies are successful?

There is no unique recipe to accelerate the digitalisation of air transport operations. However, there are some essential ingredients to get the whole thing moving. The MH370 tragedy demonstrated clearly the lack of a global surveillance system and the impact of data access being limited to each operator's strict scope and geographic area. Access to data in an open and standardised way is certainly one of the key changes required.

The EUROCONTROL Network Manager (NM) is already a catalyst for ATM digital transformation, and we continue to observe a very significant increase in our operational data access (NM B2B) with message exchanges in the dozens of millions a day. With these — open SWIM standard - services, EUROCONTROL is already responding to the needs of more than 37 countries worldwide in terms of data and global interoperability. The NM B2B services are at the heart of NM's Interoperability Strategy, and aligned with the European Aviation Strategy and the Digital Single Market. They have stimulated creativity and innovation and have contributed to safer and more operational-efficient and cost-efficient services. They form the backbone for inter-regional data exchange that supports the global ATFM vision.

Nevertheless, the key change to enable digitalisation of air operations for AI based solutions resides in the safety critical nature of aviation operations. The current certification/approval process is based on deterministic solutions — where the human can predict what decisions the machine will make in a given situation. Deep learning by its nature is very different and for that reason, we will certainly need to adapt our certification/approval process to reflect that. This is a significant change of culture, but we are confident based on our initial deployed AI-Based applications that solutions exist. These experiences are also fed into EASA and its AI aviation regulatory framework.

How can the aviation industry ensure that digitalization and AI strategies promote safety, security and sustainability?

Aviation safety has developed primarily on the basis of lessons learned from previous incidents. Thanks to the quality of air traffic services, safety-related incidents are rare. So safety cases and demonstration requirements rely heavily on expert judgement. Digitalisation and AI open up new possibilities for aviation safety as huge amounts of data can now be processed in order to identify unknown risks. So while today we are still struggling to put in place an efficient reporting system for safety occurrences including all aviation actors, digital solutions have the potential to process and detect unsafe situations that today could go unreported or unanalysed. In addition, digitalization enables us to virtually recreate such events, and so improve the definition of preventative actions such as retraining, improved supervision etc.

Artificial intelligence in the sense of a machine that can truly think for itself and make reasonable decisions in complex and open-ended situations, such as air traffic control and aviation more generally, is some way off, and so for the medium term there will need to be at least a supervisory level of human control. To remain safe and secure during the evolution of AI (e.g. from machine learning to generalised AI), a new human-machine partnership needs to be established.

According to an AIRBUS study, disruptive technology introduction in Aviation has demonstrated significant safety improvements but with an initial operating phase resulting in an increase of fatal accidents often attributed to human errors. With the introduction of AI we should not fall in this trap and perhaps rather aim to use AI to de-risk the introduction of new technologies. It is critical for the human, whether air traffic controller or pilot, to know when the system is employing AI. Moreover, the human needs to develop a calibrated degree of trust in the machine, and to retain the capability to recover from system failures including cyber-interference or biasing of the AI system, but also for the cases of rare failures for which the system's database is currently not adequate.

Embracing new technologies and concepts using non-aviation specific means (e.g. Cloud, 5G, Internet of Things, satellite communications and navigation) will inevitably increase the number of aviation actors potentially impacted by a cyberattack. Aviation systems/services need to become more and more cyber-resilient while remaining safe and cost-effective.

In a broader perspective, to ensure higher level of safety and security in particular, we need to understand what AI is about, what it can do right but also what can go wrong. Machine Learning depends on the data you feed the machine — and such data can be biased. AI requires the system to emulate human values, including the priority of safety (safety culture), or else unsafe decisions will be made, as most machine intelligence systems today use algorithms based on cost-reward calculations. We therefore need to bring an "AI culture" into aviation, as we did with the "Safety Culture" approach

Along with AI Culture, we need to be very aware of the impact of AI on Just Culture — which is a fundamental principle in aviation. In a 'Just Culture', operators, irrespective of whether they are front-line or not, are not punished for actions, omissions or decisions which are commensurate with their experience and training. An 'AI Culture' will therefore clearly need to address how we will manage an accident or incident caused by a controller or pilot following the advice of an intelligent machine.

Who (airlines, aircraft manufacturers, tech companies, trade associations, ICAO, others) is in the best position to lead the industry towards successful digital and AI implementations?

To ensure a successful digital transformation and development of AI-based applications all aviation stakeholders, in their respective roles, need to be involved and committed and cooper-

ate to make this transformation a reality and success for our sector. Without such engagement, there exists a risk that the transformation will happen anyway from outside the aviation community. A well-coordinated implementation approach should maximise the benefits for all aviation stakeholders. It would in particular build on an existing robust safety and security culture, and on the high-level of automated and autonomous systems expertise we have in aviation today.

All of us should be part of this change. EUROCONTROL is a great believer that such changes should happen from the inside. We have recently launched the European Aviation Artificial Intelligence High Level group committed to develop a roadmap and practical recommendations to accelerate the uptake of AI in our sector. This group is a public-private group, composed of EU bodies, international organisations in aviation and aviation industries representatives.

What is the role of ICAO and of industry associations in the movement towards digitalization and AI?

We in the aviation sector through ICAO, industry organisations, EU bodies as well as within EUROCONTROL can play a role of catalyst to accelerate aviation digitalisation and AI uptake. The first steps should be to demystify AI, to manage the change, and to showcase first AI-based applications in the aviation sector.

ICAO has also an important role to play at global level in developing the necessary provisions ensuring interoperability of AI-based services. Moreover, there is a need for global standards to help share open, fair and complete aviation data sets across all aviation stakeholders.

What policies and regulations need to be instituted, altered or removed to ensure successful implementation of digitalization and AI in aviation?

AI is a technology that can apply to all sectors. Europe is supporting the development of what is known as 'Trustworthy AI'. Trustworthy AI has three components, which should be met throughout the system's entire life cycle: 1) it should be lawful, complying with all laws and regulations, 2) it should be ethical, ensuring adherence to ethical principles and values and 3) it should be robust, both from a technical and social perspective, since even with good intentions, AI systems can cause unintentional harm. However, other regions of the world do not yet fully share all of these principles.

Given that aviation is based on global operations under the Chicago Convention, one could argue that it would be a mistake to apply different principles to AI-based solutions depending on the geographic location being flown. Hence the need to look into a global approach for AI.

As regards revised regulatory framework and policies, open data policy and governance, safety, security and notably Cyber, operating procedures and training provisions should be reassessed.

In other sectors, e.g. justice or security, AI algorithms are starting to be used and raise ethical concerns; for example West Midlands Police recently announced the development of a

system called NAS (National Analytics Solution): a predictive model to "guess" the likelihood of someone committing a crime. We need to be vigilant about this ethical dimension as with AI-based products personal data (e.g. passengers but also pilots, controllers, and other aviation staff) are likely to be used and we cannot just accept decisions to be taken by algorithms to ensure safe and secure air transport operations.

Is a performance-based approach to human involvement and to regulation sufficient or is there a need to be more prescriptive on when human involvement and management is essential?

A performance-based approach is needed with or without AI to ensure a system does not affect the overall performance of air operations. Currently, systems developed in aviation for safety critical operations are producing a deterministic response. This allows the establishment of clear repeatable human operating procedures. So for example, at any stage until touchdown, a pilot can abort a landing by initiating a go-around; he remains the one making the decision. Nevertheless, this remains a performance-based approach in which the human response is part of the risk and mitigation assessment.

With AI, the degree of delegation will vary depending notably on the type of AI used and the level of customisation to the user's performance. Hence, the AI system should enhance the performance of the human by reducing the complexity of its task. This will lead to a variable, non-systematic and non-deterministic involvement of the human in the decision. Therefore, a prescrip-

tive involvement of the human may not be appropriate in all circumstances. Moreover, if the AI used and results/decisions made are opaque to the user, the system should not be deployed.

At the same time, if we are prescriptive on the machine taking over human tasks when the pilot or controller no longer has their full cognitive capacities we could reduce some of our current risks. Just to give you an example of current pilot incapacitation case: a malicious or hostile act such as assault by an unruly passenger, terrorist action or small arms fire, or possibly malicious targeting of aircraft with high powered lasers by persons on the ground.

Digitalization and AI will reduce the cognitive load on humans but will also have a significant impact on the need for human time and resources. How can aviation best anticipate and manage that impact?

There has been a significant amount of research to tackle the problem of integration of a high level of automation in the aviation system including in the ATM SESAR programme. So far, automation of ATM has been shown to be difficult. When considering Deep Learning where AI decision-making tools or resolution tools are more difficult to explain, controllers need to be much more involved in original development so they can understand their limits, trust these tools and be more ready to work with them. In addition, the AI decision-making tools needs to be adapted to the person using them so as to strengthen their ability to detect errors and manage crises. The desirable performance outcome is that the human-plus-AI-system is better than either one (AI or human) alone.

What changes are needed to recruitment, management, retention and retraining practices to ensure adequate and appropriate human resources that thrive in the digitalized aviation workplace?

Most sectors transitioning to a digitalized workplace are faced with the same issue — a shortage of the required skills among existing staff and the high costs of recruiting staff with existing expertise. So significant effort in reskilling and continuous training are required in order to anticipate, adapt, upskill, retrain and take advantage of the opportunities presented by new AI-related activities. However since aviation and in particular ATM is a human-centric area of activity, new social and behavioural skills will be needed for operators to adapt to a highly automated systems.

Digitalised services are developed based on three types of technical profiles: data scientists, computer scientists and experts of the given domain. As these skills are very different, it is essential that a good mix of these three profiles are developed and or recruited. Co-creation principles applied to interdisciplinary skills should be applied and the process should also rely on operational experts who will use the system. Without it, AI-based applications may not be accepted nor possibly will their design enhance human and system performance.

Finally, we know that we need skills in the domain of cybersecurity for aviation. AI services are very vulnerable to cyber-threats so we have to go beyond safety culture and develop a cyber-culture at all stages of the organisation that enables the development of cyber-resilient digitalised services, notably the AI-based ones. ⬆

DIGITAL EUROPEAN SKY – HIGH LEVEL CONFERENCE ON THE FUTURE OF THE SINGLE EUROPEAN SKY / Brussels

The European Commission, together with the Finnish presidency organised a high-level conference to contribute to the growing momentum for reforming the Single European Sky and to consider the latest trends and developments in the context of ongoing and future digitalisation.

The high-level conference on the future of Single European Sky, organised by DG MOVE on 11-12 September in Brussels.

At the opening of the conference a joint stakeholder declaration was signed committing to finally and fully implementing the Single European Sky.

The declaration signatories – 21 aviation associations (A6 Alliance, A4 Airline Grouping, A4E, AIRE, ACI EUROPE, ASD, ATCEUC, Borealis Alliance, B4, CANSO, COOPANS, Drone Alliance Europe, EBAA, ECA, EHA, ERA, Gate One, IATA,

IFATCA, IFATSEA and IAOPA), have called upon the European institutions and Member States to consider the steps necessary to achieve the goals of the Single European Sky, assessing their potential impact, costs and benefits.

They have also called on the European institutions to simplify the regulatory framework and institutional set-up to make the European ATM network fit for the future.

The first panel of the whole-day conference discussed the possibilities of creating a network-centric approach to overcoming the limits of the current ATM fragmentation.

Panellists all agreed that instead of the current crisis management (in the context of short-term measures by the NM to minimise ATM delays), there is a need for structural change during which ANSPs should act with a proactive mindset to facilitate these changes and

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also co-ordinate future technological investments.

Capacity shortage on the ground was addressed too, with ACI confirming that a change in operational culture is needed and therefore integrating airports into ATM system is one of its key priorities.

During the second panel, speakers shared their views about digitalisation being the solution to enhance capacity. SESAR JU stressed its goal to move forward with the implementation of new technology through large-scale demonstrators.

Panellists agreed that one of the biggest challenges of future digitalisation might be data management and that any technological implementation should be preceded by careful safety assessment. The last session focussed on the human role in facilitating the transition to the new digital ATM environment. As was stated, change starts with proper training and whilst automation is the tool to improving the system, the human will always remain fundamental. One of the speakers reminded delegates that safety should focus on managing risks but should not be used as an excuse to resist change.

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DIGITAL
EUROPEAN SKY

High Level Conference on the Future of the Single European Sky

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11-12 SEPTEMBER 2019
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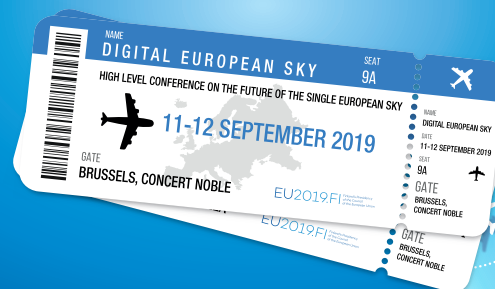
Future of the Single European Sky (SES)

A Joint Stakeholder Declaration

We, representatives of the ATM stakeholders, are aware that, as a result of how the ATM network in Europe is currently operated, it has reached serious capacity problems and that there is a pressing need to prepare for its longer-term future. Recent growth in air traffic is causing delays of a magnitude not seen for more than a decade, creating inconvenience for passengers, and at the same time, posing a growing challenge to the improvement of the sustainable environmental performance of the sector. Against this background, we recognise that:

> safety will continue to be industry's priority and has to be underpinned by Just Culture;

> security of ATM remains paramount;

> civil-military collaboration is key;

> the environmental performance of aviation remains one of the key objectives of SES;

> the implementation of the SES vision can only be achieved through coordinated efforts by all ATM stakeholders, States and European institutions. This approach should be the foundation for the future of the SES;

> all stakeholders need to consider the effect of their actions on the entire network, recognising that the Network Manager has a key role in optimising the functioning of the network through enhanced and effective Collaborative Decision Making (CDM) processes with all the operational stakeholders;

> the future ATM network in Europe needs to be inclusive on a fair and equitable basis, and able to accommodate all types of airspace users, civil and military, as well as new entrants, ranging from drones at both high and low flight level, and other new types of aircraft and space vehicles;

> greater flexibility and resilience of the ATM network are needed in combination with improved predictability so that the capacity of the system can be better scaled to demand, while respecting the environmental implications of a growing aviation sector;

> continued acceleration of the uptake of new interoperable technology, including those building on SESAR validated solutions, and increased digitalisation and automation supported by appropriate regulation are the key elements to increasing the scalability of the ATM system in Europe, while considering the increasing importance of security, especially cybersecurity. A smooth and efficient change management process, at all levels, is key for success;

> the human and collective dimensions are key elements in the implementation of new technology. This should be achieved in full cooperation with and inclusion of staff representatives and unions;

> ATM needs to become a more customer-focused system, ensuring that all stakeholder needs are balanced;

> the simplification and a clear distinction of roles and responsibilities are required in the institutional set-up at European level. Whatever institutional arrangements are decided they should ensure that there are no duplications and overlaps, that sufficient expertise is available and that functions are performed in a cost-effective, environmentally- and socially-aware and safe manner.

DIGITAL
EUROPEAN SKY

High Level Conference on the Future of the Single European Sky

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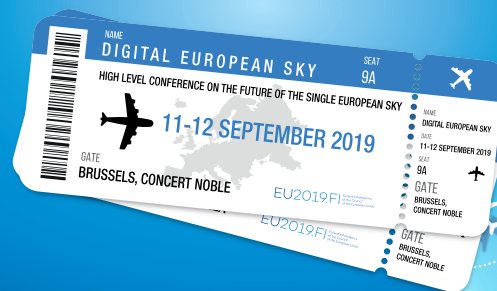
We hereby agree to the following:

> The ATM network must function as a fully integrated system in which every node acts under a systemic approach where the Network Manager plays the central role to overcome traffic challenges while maintaining safety levels. The idea is that optimising the ATM network and its interfaces is decided upon collaboratively (CDM) and takes precedence over any individual requirements and preferences by executing effectively the network functions and respecting the needs and the responsibilities of the military. This applies both in the air and on the ground because operations in the airspace and at the airport cannot be addressed separately. The Network Manager will duly take into account the legal obligations of the concerned stakeholders.

> Digitalisation is a driving force for providing flexible capacity and making the ATM system more scalable. SESAR technology, including an open system architecture, represents the key enabler for the future ATM system to be safe, cyber-secure, interoperable and supportive of environment-friendly operations.

> As the ATM system evolves, so too will the role of the workforce. It is therefore essential to reinforce the dialogue on future developments between the social partners.

> When a full understanding of ATM technological evolution is achieved, training for ATM staff and, where relevant, licensing requirements, need to be re-assessed with the full involvement of social partners (staff representatives, employers, etc.) and EU institutions in coordination with EASA.

> The effectiveness of the economic regulation of European ATM requires targets to be set where market forces do not exist and incentives to be put in place for the modernisation of the ATM system, considering the interdependency between different key performance indicators.

> Public funds, including for SESAR research, industrialisation and deployment, are important support to the modernisation of ATM, specifically in situations of negative business cases.

Next steps:

The stakeholders commit to:
> All actors in the aviation value chain to intensify efforts to realise the full environmental benefit of the Single European Sky.

> Operational ATM stakeholders to engage in the implementation of an airspace architecture transition plan as an integral part of the ATM Master Plan and to play a proactive role in the implementation of measures to improve the ATM network as a whole.

> Staff organisations in cooperation and in negotiation with their employers, with the support of the European Commission, EASA and the Member States, to develop a roadmap on the human role in facilitating the transition to the new digital ATM environment while addressing the future requirements for pilots, air traffic controllers, ATSEP and other relevant ATM staff training and licencing.

> The Network Manager to continue to work closely with operational stakeholders on developing and applying measures to address short-term capacity bottlenecks and to mitigate delays in the network while continuously optimising the functioning of the network, including large and small nodes, when necessary.

> All ATM stakeholders to ensure timely industrialisation and implementation of interoperable technological solutions, where appropriate on the basis of common standards, in collaboration with the relevant institutions.

The stakeholders call upon:
> The European institutions on one hand and the Member States individually on the other hand to consider the steps necessary to achieve the goals of the SES, assessing their potential impact, costs and benefits.

> The European institutions to simplify the regulatory framework and the institutional set-up to make the European ATM fit for purpose, allowing it to respond to present and future needs.

**THE FIFTH ANNUAL
ICAO WORLD AVIATION FORUM**
INNOVATION IN AVIATION
MONTRÉAL, CANADA | 22 - 23 SEPTEMBER 2019

Outcome Statement agreed at the Ministerial Roundtable at the Fifth ICAO World Aviation Forum (IWAF/5) in Montréal, Canada on 23 September 2019

We, the Ministers responsible for transport in Member States of the International Civil Aviation Organization (ICAO) and the Heads of international organizations, have assembled to seek understanding of, and to orient our response to, challenges and opportunities arising from innovation and frontier technologies, as well as new concepts of operation that are rapidly becoming available and increasingly transforming the aviation sector.

We acknowledge that frontier technologies, being at the intersection of radical forward thinking and real-world implementation, provide innovative solutions and tools to the air transport system such as automation and unmanned systems, transport electrification, big data, artificial intelligence and machine learning, and digitalization of processes. We encourage the aviation sector to continue to embrace innovation and frontier technologies to shape the future of the aviation business and address issues such as emissions reduction while ensuring their safe, secure, efficient and sustainable use.

We are fully aware of, and welcome the potential of these technological and regulatory innovations, to significantly accelerate the realization of socio-economic benefits and improve environmental performance through a seamless air transport system. We also underline the contribution of innovation towards achieving ICAO's objectives that there is *No Country Left Behind* (NCLB) and the Sustainable Development Goals (SDGs) set in the United Nations (UN) *2030 Agenda for Sustainable Development*.

Policy and Business Models for Innovation

We support ongoing initiatives and efforts by States to establish an enabling institutional, legal and regulatory framework for aviation stakeholders to operate, for technological innovation to thrive and expand, for emerging products and solutions to be effectively implemented, and for the benefits of the new era of urban air mobility to be fully realized.

We appreciate the unique challenge our leaders are faced with in the wake of these technological developments, which calls for an unprecedented design of a balanced environment capable of fostering innovation while ensuring regulatory and policy transparency and enforcement, legal certainty for businesses, cybersecurity, consumer and data protection, and a fair, environmentally, economically and socially sustainable development on a global scale.

We observe that substantial research and development (R&D) investments will continue to be required but certain new technologies incur relatively low development costs, allowing small and medium-sized "start-up" enterprises to be at the forefront of transformation in air transport. Regardless of breakthrough inventions or small-scale, incremental improvements alike, we should adapt to the new reality of the innovation process and adopt favorable measures in the progress from research to implementation.

We underscore that the enabling framework should not be technology specific but rather be designed to facilitate the timely evaluation and assessment of technological developments with the objective to allow an early integration, deployment and application of these technologies, strengthen incentives for entrepreneurship and provide a hospitable legal environment for the successful realization of "start-ups" in the aviation sector.

Innovation in Aviation Regulation and Governance

We recognize that the nature and pace of innovation require regulators at the national, regional and global level to avail themselves of new methodologies and tools. Latest technologies have the capability to accelerate aviation regulatory processes and make them more efficient, streamlined and responsive, allowing governments to level up with the speed of change in the industry and to fully leverage the potential benefits offered by technological advances.

We stress the importance of good governance which, based on greater coordination and communication between and across transport authorities and other ministries in charge of related portfolios, will provide for an expedited decision-making process, facilitate the reconciliation of objectives and needs with responsibilities and resources, and drive the process optimization in responding to new technology landscape.

We call for States to examine how latest and future technologies can be used to improve the existing regulatory frameworks of air transport, to facilitate the implementation of global standards, to increase the efficiency and effectiveness of processes while securing the value created, to enhance cyber resilience and to minimize potential risks and threats to the aviation sector.

Moving Forward / Next Steps

We wish to continue our cooperation among all stakeholders with the objectives to identify and evaluate the effects of the discussed frontier technologies, to accurately estimate the future demand and costs associated, to mobilize and secure necessary resources and to explore the possibilities of leapfrogging and taking full advantage of such technologies to bridge the technological divide between developed and developing countries.

We are committed to sharing our experience between States and among the States, governmental and non-governmental organizations, the private sector, academia and the relevant UN system entities in order to facilitate the introduction of innovation in civil aviation, strengthen community outreach efforts, and establish an inclusive dialogue at a strategic level that will encourage further collaboration in relation to innovation.

We look forward to the deliberations at the 40th Session of the ICAO Assembly related to Innovation in Aviation and trust that the Assembly will take into account this Statement.

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Call for long-term aviation emissions target, CORSIA support, and new CAEP supersonics study among key environmental protection outcomes at 40th ICAO Assembly

Important civil aviation Environmental Protection outcomes were established this year at the 40th ICAO Assembly, including the strengthening of international resolve to move forward on the implementation of the CORSIA emissions offsetting solution for international flights and the basket of measures of environmental protection to reduce emissions.

States' decisions relevant to CORSIA included advancing work supporting CORSIA-eligible fuels and emissions units, progressing the structure of the CORSIA central registry, and the continuation of ICAO's ACT CORSIA capacity-building initiative, which has been of tremendous assistance to many national governments.

With the 40th Assembly taking place during a period characterized by the world's largest ever climate marches—including one which passed right before ICAO's doorstep on 27 September led by Swedish activist Greta Thunberg—it was recognized as an encouraging signal that governments reconfirm their resolve in support of the CORSIA global offsetting solution.

While highlighting the successful adoption of the new fourth volume to Annex 16, and the ICAO-driven development and implementation of 116 State Action Plans to reduce aviation-related CO_2 emissions, further ICAO Assembly decisions called for prioritization of a long-term global aspirational goal for international

aviation CO_2 emissions reduction, and the need for further elaboration of the 2050 ICAO Vision on Sustainable Aviation Fuel.

States also acknowledged the excellent progress recently achieved through ICAO on the first aeroplane CO_2 emissions standard, and the non-volatile Particulate Matter standard for aircraft engines. They also called for ICAO's Committee on Aviation Environmental Protection (CAEP) to prioritize an exploratory study on environmental impacts of new supersonic aircraft being developed. At the conclusion of the 40th Assembly on Friday evening, States acknowledged the crucial leadership of the President of the ICAO Council, **Dr. Olumuyiwa Benard Aliu**, towards achieving these outcomes. A number of States took the floor of the Assembly to stress the importance of an inclusive and sustainable approach to the development of the global civil aviation system, and thanked Dr. Aliu for his personal commitment in this regard.

40th ICAO Assembly endorses key action items for global aviation's Security and Facilitation strategic objective

States endorsed a wide range of security- and facilitation-related topics at the 40th Session of the ICAO Assembly this year, reflecting both their long-term objectives and their broad support for a new Declaration on Aviation Security – affirming global commitment to strengthening implementation.

States also welcomed and endorsed the ICAO Cybersecurity strategy for the air transport sector, a first-of-its-kind response which features key goals

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relating to information sharing, improved coordination among all partnering government and enforcement entities, and timely and aligned responses to related risks and events.

They further endorsed ICAO's expeditious delivery of the Global Aviation Security Plan (GASeP), with over 160 States participating in the lively discussions, and supported the ICAO Secretariat's initiative to establish a mechanism for reporting implementation progress, which is critical in encouraging all States to reach the GASeP aspirational targets for 2020, 2023, and 2030.

"ICAO is very grateful to have received such a strong endorsement of the GASeP, and to be reassured once again that the accelerated development and implementation of this important global resource is meeting the expectations of States, counter terrorism agencies, and international enforcement stakeholders" underscored ICAO Secretary General **Dr. Fang Liu**.

Further Security and Facilitation developments included States' endorsement of ICAO's continuing work on passport and border control modernization, and identity-related infrastructure, under its Traveller Identification Programme (TRIP) strategy.

States additionally supported the recommendation that governmental authorities worldwide should join the ICAO Public Key Directory to boost their e-Passport security.

There was also clear agreement that ICAO should increase its outreach to States on the implementation

of Advance Passenger Information (API) systems, in line with United Nations Security Council resolution 2396 (2017).

The Assembly adopted a new resolution on the development and implementation of facilitation provisions to combat human trafficking that, inter alia, urged States to implement the relevant Annex 9 provisions on the matter, and to use ICAO's guidance material developed to assist States.

Lastly, the Assembly endorsed the continued addressing by ICAO of the recommendations that emerged from the Second High-level Conference on Aviation Security convened in 2018. Attention was focused on countering the insider threat, furthering the work on Cybersecurity governance, achieving the national targets reflected in the GASeP, completing a comprehensive review of the Universal Security Audit Programme, and other aviation security priorities.

Hermes presented two information papers:

• EDUCATION AND PERFORMANCE IN AVIATION: REALISING AND SUSTAINING BENEFITS

The paper was included in the REPORT OF THE EXECUTIVE COMMITTEE ON AGENDA ITEM 25 **(https://www.icao.int/ Meetings/a40/Documents/WP/wp_637_en.pdf)**

• REGULATORY ENVIRONMENT FOR A SUCCESSFUL AIRLINE INDUSTRY

The paper was included in the REPORT OF THE ECONOMIC COMMISSION ON AGENDA ITEM 31& 31 **(https://www. icao.int/Meetings/a40/Documents/WP/wp_618_en.pdf)**

International Civil Aviation Organization

WORKING PAPER

A40-WP/408
EX/167
31/07/19
(Information Paper)
English only

ASSEMBLY — 40TH SESSION

EXECUTIVE COMMITTEE

Agenda Item 25: ICAO Civil Aviation Training Policy and Capacity Building in Aviation

EDUCATION AND PERFORMANCE IN AVIATION:
REALISING AND SUSTAINING BENEFITS

(Presented by the Hermes Air Transport Organisation)

EXECUTIVE SUMMARY	
Aviation is facing significant challenges in hiring and retaining personnel to meet rapid growth and to address the increasing use of automation and artificial intelligence. Putting people first is a key requirement and so education and training must be seen as key priority for the International Civil Aviation Organization (ICAO), States and industry alike.	
Strategic Objectives:	This working paper relates to Strategic Objective D — *Economic Development of Air Transport.*
Financial implications:	Not Applicable.
References:	Not Applicable.

1. **INTRODUCTION**

1.1   Air traffic is expected to double over the next twenty years. This will inevitably create new challenges in terms of equipment (e.g. aircraft) and infrastructure (e.g. IT systems, airports), but also in terms of hiring and developing personnel. In this context, education and training in the sector (both of technical and managerial) should be seen not only as a cost, but also as the roadmap to competitiveness and success in the marketplace. Putting people first is of the essence in an increasingly automated sector and appropriate policies should be designed to address the various knowledge and skills gaps. Moreover, it is important to reach the appropriate scale of sector-educated and trained people to realise and sustain benefits for all involved stakeholders. Addressing the issue of education and training in the sector is of major importance from both a quantitative (i.e. number of educated employees) and qualitative (i.e. in terms of bridging the skills gap between what is needed by the market and what is offered by education service providers) perspective.

- 2 -

1.2   This working paper highlights education and training as an investment, outlines the challenges faced by the aviation industry in recruiting and retaining personnel, and provides recommended actions that may be undertaken to improve training and educational strategy in aviation.

2.   **EDUCATION AND TRAINING IN AVIATION AS AN INVESTMENT**

2.1   Education and training in aviation should be considered as an investment based on three major factors, namely cost, return and risk.

2.2   To the individual seeking training and development, the cost has two major components: the monetary aspect in terms of tuition fees and the time dimension related to the time spent on being trained. Returns refer to the salary, career progression and non-pecuniary benefits (such as health insurance and benefits-in-kind, such as free flights) that may be received from an aviation career. Risks refer to the possibility of not gaining employment after having received the education and training, as well as the possibility of being locked into a sub-optimal career progression path due to low transferability of the acquired skills.

2.3   There are also costs, benefits and risks to the aviation organisation. The organisation may incur costs either directly through in-house training or by subsidising training at partner or third-party organisations. Benefits include improved performance from trained personnel and increased retention of personnel. Risks include the possibility of trained personnel leaving the organisation, perhaps even to competitors.

2.4   So, if appropriate actions are to be taken to ensure that education and training in aviation are to progress and thrive in the future, the following three points need to be addressed.

2.5   First, who should bear the cost of training and education? Should the cost be borne by the trainee, by the aviation service provider (i.e., airline, airport, air navigation services provider, etc.) or by the government? In an increasingly market environment of post-secondary education, governments in many countries may be reluctant to fund industry-specific training. As aviation education and training may be costly to provide, predominantly in the case of training flight crews, but also with other operational and managerial skills, interested individuals may choose other less-costly careers. In fact, many aviation service providers, and especially airlines, operate with low profit margins, thus reducing their capacity and their inclination to fund training, especially if skills can be easily transferred to other organisations. Similarly, governments may be reluctant to subsidise aviation training, even external benefits from the aviation sector (e.g. to trade and tourism) given other spending priorities and negative externalities from the sector, such as carbon emissions.

2.6   Second, the aviation sector may not be as appealing to new recruits, as was the case in the past. Many people in the Generation Y and Generation Z age groups may be attracted by firms perceived to be operating in more dynamic industries, such as, start-ups in the IT sector, characterised by potentially very large returns and the excitement of working in "cutting-edge" positions. Furthermore, the aviation industry may not be seen as being as "green" as other industries given its contribution to greenhouse gas emissions. Young recruits may prefer to work in industries considered to be better for the environment.

2.7   Finally, given the rapid changes in technology, risks in aviation education and training may be rising. People may be replaced by technology, as key positions, such as air traffic control, are transformed due to technology. Unless training organisations are at the cutting edge of technology, it may be that the skills and education gained by students will be obsolete in the near future.

3.   CHALLENGES TO MEET

3.1   Given the above discussion, the following challenges emerge with respect to education and training in the aviation industry:

a)   *Meeting the needs of a growing industry*: The aviation industry is projected to continue to grow over the upcoming years, with growth faster in some areas of the world, such as Asia-Pacific and Africa. This growth will generate increasing needs for personnel in all areas of the aviation sector.

b)   *Competing for personnel*: Aviation must compete with other industries for available personnel. As populations age in many areas of the world, there are fewer "young people" as a proportion of the population. Traditionally, the aviation industry has relied on travel benefits as incentives for attracting new recruits. However, these may not be the primary benefits demanded by the younger generation. They may be more interested in personal development and growth opportunities. Moreover, much of the aviation industry has traditionally not been as profitable or provided the job security as other industry sectors. So, based on pay, personal growth and development, and job security, the industry may find it difficult to compete for personnel with other more attractive and higher-paying industries.

c)   *Retention*: Related to the challenges of hiring new personnel is the problem of retaining personnel. Given the needs for personal growth, the industry will have to develop in-house training programmes and partner with educational providers in order to facilitate this growth. Retention is especially a problem in regions of the world with lower pay levels, as personnel may migrate to higher paying positions outside the region. Therefore, creating growth opportunities within these lower-paying areas is especially important.

d)   *Providing Training Opportunities*: The aviation industry, itself, cannot fully meet its training needs. Therefore, it needs to partner with educational institutions and other training providers. It may be that traditional educational institutions are best suited to providing the "soft-skills" needed by the industry. However, the aviation industry will need to compete with other industries for these new hires. There are ways that the aviation industry may increase the probability of hiring new recruits from these educational institutions, such as offering internships, working with the placement offices in the educational institutions, and volunteering as guest speakers in classes. On the other hand, training in the technical skills may best be offered in-house or in partnership with specialised training organisations. Traditional higher educational institutions generally do not have the expertise needed to provide this type of training.

e)   *Filling the Gender Gap and Addressing Diversity*: In a liberalised and commercialised environment, knowledge of economics, management, marketing and soft skills become essential to effectively running a business. Recruiting personnel in these areas, as well as in more technical areas, is essential. As a result, the industry must look to recruit individuals currently underrepresented in aviation. In particular, recruiting more women will be required, since the percentage of women in the industry is relatively low, compared to the percentage of women in the workforce, in general.

f) *Automation and Artificial Intelligence:* Aviation education should be pursued as a Science, Technology, Engineering and Mathematics (STEM) field, focusing on helping recruits and current employees discover science and technology fundamentals. Expected developments in technology may have important implications for aviation jobs in the future and the training of personnel to undertake these positions. Unmanned and remotely controlled aircraft may question the need to train pilots; robots may be able to undertake many operational tasks currently undertaken by people; blockchain technology may reduce errors and the need for control; while artificial intelligence may render data analysts and managers less important if not redundant.

4. RECOMMENDATIONS

4.1 First, it is important for the industry to gain comprehensive situational awareness of its status and future needs. This can be gained through a series of studies and needs-analyses that focus on current industry standing and future prospects. These will include but not be limited to salary levels, levels of technology penetration, employee satisfaction and mobility (inter and intra). Specific policies and recommendations can be more effectively drawn and produce tangible and systematic results in the long run if they are based on comprehensive data gathered through these studies. International organisations will be of importance in assisting with data gathering and helping to shape the questions addressed by these studies.

4.2 Second, effective and systematic industry-education partnerships must be developed at national, regional and even global levels that will provide a framework for addressing future educational and training priorities of the industry. Such a framework can provide for a flexible and sustainable means to address future industry needs.

4.3 Third, it is important that the aviation industry examine best practices found in other industry settings in regard to effective training and education regimes, industry-education partnerships, as well as employee satisfaction and retention. Otherwise, the aviation industry may be outcompeted for the best talent by industries perceived as providing better opportunities for employment and advancement.

4.4 Fourth, it is important to ensure that current aviation employees can be usefully re-deployed or re-trained. The acquisition of educational skills should prove flexible enough to accommodate technological disruptions in a service sector such as aviation. At the same time, the aviation industry must hire recruits with the soft skills, such as customer service, that are so important in the industry. Moreover, education and training in aviation should address gender imbalances. Finally, aviation industry stakeholders should become more proactive in partnering with educational institutions, both traditional and more specialised. Effective industry education partnerships can be built in two ways: a) through direct partnerships between aviation businesses/organisations and academic institutions/training centres. These partnerships can focus on specific skills that need to be developed in the industry; and b) through networks that include government, academia and industry that can address skills required by the aviation industry, as well as many other industries.

5. CONCLUSION

5.1 The Assembly is invited to consider:

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a) working jointly with industry associations to ensure that appropriate studies are conducted to gain comprehensive situational awareness of the status and needs for education and training at global, regional and national level; and to identify the key priorities;

b) supporting the development of effective aviation industry and education partnerships to provide a framework for addressing future educational and training priorities;

c) working jointly with industry association to identify the relevant best practices adopted in other industries to successfully compete for and retain personnel;

d) ensuring the development of best practice education and training programmes and processes so that current employees can be usefully deployed and retrained; and

e) ensuring that all initiatives and actions related to education and training in aviation address diversity imbalance.

— END —

40th ASSEMBLY

International Civil Aviation Organization

WORKING PAPER

A40-WP/415
EC/35
31/7/19
(Information paper)
English only

ASSEMBLY — 40TH SESSION

ECONOMIC COMMISSION

Agenda Item 32: Economic Regulation of International Air Transport — Policy

REGULATORY ENVIRONMENT FOR A SUCCESSFUL AIRLINE INDUSTRY

(Presented by the Hermes Air Transport Organisation)

EXECUTIVE SUMMARY	
Decision-makers should consider the benefits from creating a regulatory environment that will allow airlines access to the capital necessary to effectively compete in the industry. This may include relaxing ownership and control restrictions. States should consider acting in concert with like-minded states to develop the environment needed to support aviation growth. Although ownership and control barriers may remain in certain regions, a new multilateral approach to airline regulation can emerge under the auspices of ICAO.	
Strategic Objectives:	This working paper relates to Strategic Objective — *Economic Development of Air Transport.*
Financial implications:	Not Applicable.
References:	Not Applicable.

1.   **INTRODUCTION**

1.1.   Air transport is a major contributor to the world economy characterized by solid growth. To accommodate this growth, it is forecast that about 37,500 new passengers and dedicated freighter aircrafts at a value of US$5.8 trillion will be needed over the next 20 years, compared to the current fleet of around 26,000 aircrafts. These immense capital requirements are intensified by the need of airlines to fund other processes including investments in big data analytical systems, product customization and baggage handling.

2.   **OWNERSHIP AND CONTROL ARE BARRIERS TO AIRLINE FINANCING**

2.1.   Securing airline financing is faced by severe difficulties. These difficulties are confounded in the airline industry by ownership and control restrictions that inhibit the ability of airlines to finance their operations. As in every industry, including other parts of the air transport supply chain, investors are expected to carefully balance expected returns against risks. Small markets and inability to

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reap economies of scale and scope may significantly discourage investors who also prefer to avoid funnelling money into fragmented sectors characterized by hyper-competition. Moreover, complexities in the regulatory environment and legal uncertainties create further disincentives for investment. These regulatory barriers may limit market size; allow inefficient carriers to remain afloat; and raise investment risks from a legal perspective. In fact, these barriers may significantly inhibit financial/portfolio investors, while the inability to effectively control an airline may discourage strategic investors and deny potential synergies emerging at the airline level.

3. CIRCUMVENTING OWNERSHIP AND CONTROL BARRIERS ARE HELPFUL BUT NOT THE SOLUTION

3.1.   There seems to be empirical support that effectively dealing with ownership and control clauses may have a positive impact for the airline sector. The European Union has created new industry dynamics by substituting national with community ownership and control clauses thus encouraging *inter alia* the development of low fare airlines and allowing consolidation through mergers and acquisitions among network carriers. In Latin America, LAN has successfully engaged in transnational acquisitions, creating among others LATAM, while Australia and New Zealand have also adopted a liberal stance *vis-à-vis* international ownership and control of their carriers.

3.2.   It is of interest also to note that even in parts of the world where national clauses in ownership and control are powerful, alternative market responses are also possible. The establishment of the three strategic alliances (i.e. Star, SkyTeam and Oneworld) among network carriers is certainly a success story in terms of creating a global network experience. Similarly, low fare airlines such as Air Asia/JetStar and Air Arabia have managed to establish a solid presence in Australasia and the Middle East/North Africa respectively by establishing local subsidiaries.

3.3.   Yet, these circumvention efforts, irrespective of how successful they may prove in the short and medium terms, add costs, raise complexity and create legal uncertainties. Thus, they fall short of achieving the benefits of full integration offered by a relaxation of ownership and control clauses. Even the community clause introduced in the European Union may face legal challenges on international routes and markets when third (i.e. non-EU) countries are reluctant to accept it in the renegotiation of their bilateral agreements.

4. AIRLINES MUST ACCESS CAPITAL TO BE SUCCESSFUL

4.1.   In any case, financing will flow to the airlines that investors believe are most likely to be successful. Successful airlines will be the carriers that have the lowest operating costs and/or the greatest ability to generate revenues. For example, airlines that can best use customer data to develop ancillary revenues may be able to gain market share, since the ancillary revenues will allow the carriers to lower base fares.

4.2.   We see the future industry as one dominated by carriers pursuing cost leadership and/or revenue generation models that extend beyond national boundaries. These carriers will have the access to private financing necessary for fleet acquisition and will be able to gain market share over carriers that are more reliant on government financing. Clearly, the industry will require a shift from a nationally-based industry to a market that better allows for international growth.

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5. CONCLUSIONS: REGULATORY REFORM CAN HELP THE AIRLINE INDUSTRY BE SUCCESSFUL

5.1.   Decision-makers should consider the benefits of being proactive in creating the environment that will allow airlines access to the capital necessary to effectively compete in the industry. This may include relaxing ownership and control restrictions within a regional context. States should consider acting in concert with like-minded states to seek regional solutions to develop the environment needed to support aviation growth. Moreover, regional blocs should develop a dialogue with other regional blocs to facilitate aviation growth for the benefit of their populations and economies.

5.2.   The successful airline industry that will emerge will be well-managed, attract investments, benefit travellers and drive GDP growth. Regulatory barriers, such as ownership and control, are obstacles to the movement towards this emerging industry, but are not insurmountable obstacles. The barriers can be lifted by governments or circumvented by airlines. However, the barriers may remain in certain regions of the world due to the political will and priorities of the countries in those regions. Ultimately, a new multilateral approach to airline regulation will only emerge under the auspices of ICAO.

5.3.   Although ownership and control may not appear as a major problem to some governments and airlines given the advent of alliances and the other workarounds employed to facilitate air transport, it may be the case that the states that are proactive in developing policies that facilitate aviation financing and growth will produce the winning airlines in the long run.

— END —

ARTICLE ✏️

By Capt. AYSHA ALHAMELI,
Permanent Representative
of the United Arab Emirates
on the Council of ICAO

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GENERAL CIVIL AVIATION AUTHORITY

Introduction

50 years or less from now, airplanes will be fully autonomous, robots will be refueling our airplanes, airports will be empty from law enforcement personnel, we will be walking through tunnels that check our biometrics and apply security measures, we will not need passports, and the possibilities go on and on. Many of the conventional functions and jobs will be replaced, but also new opportunities will be created.

Today we live the fourth industrial revolution. Our systems are interconnected, information-sharing, harmonization, and interoperability are essential in order to ensure the sustainability of the air transport system. The aviation system like many will be more and more data-driven.

Automation and artificial intelligence (AI) in aviation are not new subjects.

The evolution of the automated systems has been part of commercial aviation for years. Artificial intelligence will pose many challenges; however, it will bring significant benefits. Aviation is global in nature. ICAO is the global international civil aviation organization responsible to set standards and recommended practices (SARPS) to ensure harmonization of the aviation system, which itself serves the ultimate goal of maintaining safety, security, and sustainability of air transport. With the rapid development in automation and AI, the question of how ICAO will evolve to continue fulfilling its mandate becomes relevant.

AI is not new to aviation, especially in the cockpit. The evolution of the autopilot has brought the endless possibility of application. The more data we feed the systems, the more intelligent they become.

Autopilot and many more of the automated systems in aviation played a key role in reducing workload and increasing efficiency which led to higher safety records. But we need to keep in mind the following principle "the machines are as intelligent as the data we feed them". Data-sharing, data assurance and redundancy are keys to ensure that AI operates safely.

Data Complexity and Application

The forecasted growth and complexity in operations will challenge the

human mind, especially when dealing with big data. Interpretability of systems and data-driven operations will force the industry towards the adaption of AI to increase safety, efficiency, speed, and reduce the load, in addition to many benefits that come with tasks that require the set protocol and repeated actions.

Moreover, the future of customer service will be modernized and be focused on the passenger experience. Aviation both technically and commercially will rapidly shift from the way we know it today.

AI has the potential to enhance safety significantly. It will reduce the cognitive load (and the resulting cognitive fatigue) on pilots, as well as the number of pilots required to be at the controls. This means the crew can spend more time handling the overall strategy and mission of a flight and less time dealing with all the small sub-problems of piloting an aircraft.

Another area of AI is building autonomous vehicles and air taxis designed to transport people inside urban areas. AI could potentially be used in a passenger plane when the pilots are rendered unconscious from a fall in cabin pressure. It can add up factors and make better decisions faster under high-pressure situations compared to humans when given the right data. Consequently, it will result in a potential increase in safety and efficiency.

As machine learning and AI have the capacity of transforming the role of many professions in aviation, these technologies need to be as thoroughly tested as their human counterparts and deemed at least as competent.

Automation and artificial intelligence will have a significant impact on the most valuable resources: time and manpower. The development that we will witness will impact those advancements in machine learning and other AI technologies that will emerge in aviation—the technologies' reach could encompass nearly every aspect of the industry. Aircraft manufacturers and airlines are already investing significant resources in AI technologies in applications that span from the flight deck to the customer's experience.

Not only the private sectors but the Governments also consider AI as a big tool for smart use of human resources and time: two big assets for productive operations.

Is there a need for ICAO leadership and guidance?

The innovations and application of AI have been growing exponentially since 2017 and is projected to be even bigger in the years to come. Aviation will be an area of the great potential of its application. Good aviation safety track record is due to the implementation and harmonization of ICAO's Standards and Recommended Practices. Our systems are interconnected, and data-sharing will be essential to move forward.

ICAO will have to play an active role to connect and collaborate with other international organizations and Member States dealing with AI to gain sufficient expertise on the subject. It can learn from States and institutions that took major leap steps in the area of AI and encourage national policies and industry groups to shape their strategies accordingly. ICAO needs to

play a leadership role in enabling innovation and ensuring that safety is safeguarded.

ICAO needs to provide a global platform where States and the industry share their best practices of using the technology in aviation. Risks and opportunities related to AI should be detected quickly and shared globally. ICAO has a well-proven experience in promoting inter-State cooperation in order to ensure the proper use and maximum benefits from AI applications.

By promoting AI and sharing knowledge between its Member States, ICAO will serve its primary goal: enhancing safety, security, and efficiency of international air transport, while at the same time, promoting passenger wellbeing.

The issue of geographical disparity in access to technology will affect all of us. We cannot afford to leave anyone behind. Things are changing and will keep evolving even further at an exponential speed. We cannot afford an accident to act on the urgency to find solutions and discuss standards. We need to learn and evolve as a sector. Air accidents' cost is high and painful.

We as a sector need to be proactive, innovative and inclusive. As an international aviation regulatory body, ICAO needs to continue playing a leadership role to connect and provide a global platform for collaboration to ensure harmonization and sustainable development of air transport. ⊼

STATISTICS

JUN 2019:
Air Passenger Market Analysis

Chart 1 – Air passenger volumes

Industry RPKs (billion per month)

Sources: IATA
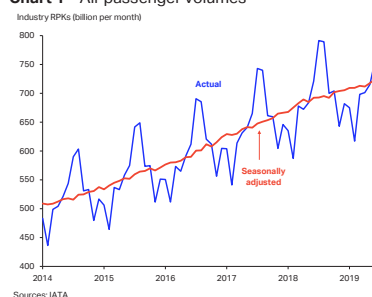
Chart 2 – Contribution to annual RPK growth in the half of each year (airline region of registration)
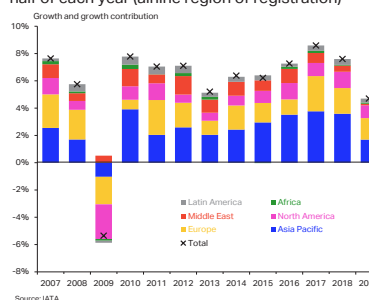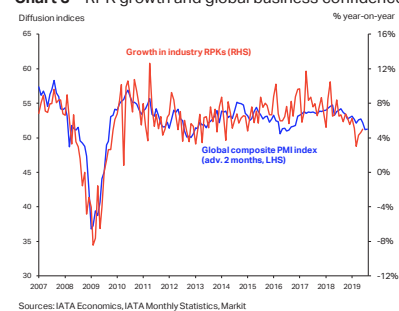
Growth and growth contribution

Source: IATA

Chart 3 – RPK growth and global business confidence

Diffusion indices / % year-on-year

Sources: IATA Economics, IATA Monthly Statistics, Markit

Chart 4 – Economic conditions (monthly data from composite PMIs, selected regions and countries)

Chart 5 – Passenger load factors by region
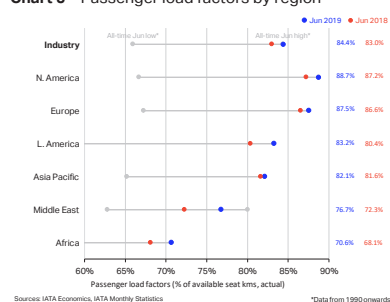
Sources: IATA Economics, IATA Monthly Statistics   *Data from 1990 onwards

Chart 6 – International RPK growth (airline region of registration basis)

Sources: IATA Economics, IATA Monthly Statistics

Chart 7 – Domestic RPK growth by market

Sources: IATA Economics, IATA Monthly Statistics
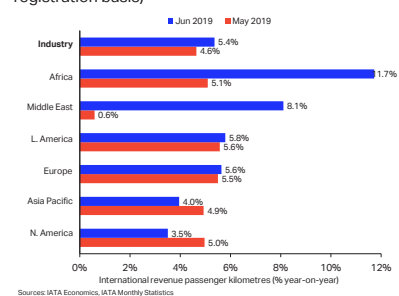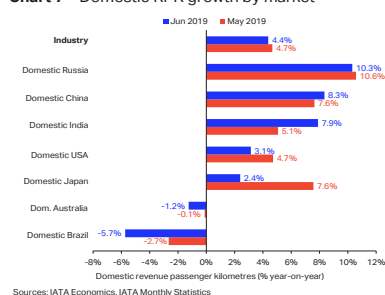
Air passenger market detail - June 2019

	World share [1]	June 2019 (% year-on-year)				% year-to-date			
		RPK	ASK	PLF (%-pt) [2]	PLF (level) [3]	RPK	ASK	PLF (%-pt) [2]	PLF (level) [3]
TOTAL MARKET	*100.0%*	5.0%	3.3%	1.4%	84.4%	4.7%	4.1%	0.5%	81.9%
Africa	*2.1%*	11.7%	7.7%	2.5%	70.6%	4.4%	2.7%	1.2%	70.8%
Asia Pacific	*34.5%*	4.7%	4.0%	0.5%	82.1%	4.8%	4.7%	0.1%	81.5%
Europe	*26.7%*	5.7%	4.6%	1.0%	87.5%	6.1%	5.8%	0.3%	83.8%
Latin America	*5.2%*	4.9%	1.2%	2.9%	83.2%	5.6%	4.3%	1.0%	82.3%
Middle East	*9.2%*	7.8%	1.5%	4.4%	76.7%	1.2%	0.3%	0.7%	75.3%
North America	*22.4%*	3.1%	1.4%	1.5%	88.7%	4.1%	3.0%	1.0%	84.3%
International	*64.0%*	5.4%	3.4%	1.6%	83.8%	4.8%	4.1%	0.5%	81.2%
Africa	*1.8%*	11.7%	7.7%	2.6%	70.5%	4.4%	2.4%	1.4%	70.4%
Asia Pacific	*19.0%*	4.0%	3.1%	0.7%	81.4%	4.6%	4.4%	0.2%	80.7%
Europe	*23.9%*	5.6%	4.5%	1.0%	87.9%	6.3%	5.9%	0.3%	84.4%
Latin America	*2.7%*	5.8%	2.5%	2.6%	84.0%	5.1%	4.3%	0.7%	82.7%
Middle East	*8.9%*	8.1%	1.7%	4.5%	76.6%	1.4%	0.4%	0.8%	75.3%
North America	*7.6%*	3.5%	2.0%	1.3%	87.9%	4.5%	3.0%	1.2%	83.0%
Domestic	*36.0%*	4.4%	3.1%	1.1%	85.5%	4.6%	4.0%	0.4%	83.1%
Dom. Australia [4]	*0.9%*	-1.2%	-0.5%	-0.6%	78.0%	-0.6%	-0.4%	-0.2%	78.6%
Domestic Brazil [4]	*1.1%*	-5.7%	-10.1%	3.8%	81.7%	0.7%	-1.8%	2.0%	82.2%
Dom. China P.R. [4]	*9.5%*	8.3%	8.9%	-0.4%	84.0%	8.2%	8.5%	-0.2%	83.9%
Domestic India [4]	*1.6%*	7.9%	3.1%	4.0%	89.4%	5.7%	6.1%	-0.3%	88.1%
Domestic Japan [4]	*1.0%*	2.4%	2.3%	0.1%	70.2%	3.7%	2.4%	0.9%	70.2%
Dom. Russian Fed. [4]	*1.4%*	10.3%	9.8%	0.4%	85.5%	11.0%	10.5%	0.4%	80.3%
Domestic US [4]	*14.0%*	3.1%	1.4%	1.5%	89.4%	4.2%	3.3%	0.8%	85.0%

[1] % of industry RPKs in 2018   [2] Year-on-year change in load factor   [3] Load factor level

[4] Note: the seven domestic passenger markets for which broken-down data are available account for 30% of global total RPKs and approximately 82% of total domestic RPKs.

Note: The total industry and regional growth rates are based on a constant sample of airlines combining reported data and estimates for missing observations. Airline traffic is allocated according to the region in which the carrier is registered; it should not be considered as regional traffic.

JUL 2019:
Air Passenger Market Analysis

IATA

Chart 1 – Air passenger volumes and latest trend

Industry RPKs (billion per month)

Actual

Seasonally adjusted

3,9 pa (CAGR)

Sources: IATA Economics, IATA Monthly Statistics

Chart 2 – Contribution to annual RPK growth (airline region of registration)

Percentage points

Latin America — Africa — Middle East — North America — Europe — Asia Pacific — X Total

Sources: IATA Economics, IATA Monthly Statistics

Chart 3 – RPK growth and global business confidence

Diffusion indices — % year-on-year

Growth in industry RPKs (RHS)

Global composite PMI index (adv. 2 months, LHS)

Sources: IATA Economics, IATA Monthly Statistics, Markit

Chart 4 – Economic conditions (monthly data from composite PMIs, selected regions and countries)

Business confidence   Legend: >50 and rising = green; >50 but stable or falling = yellow; <50 = red

	2017	2018	2019
World			
Developed markets			
US			
Eurozone			
UK			
Japan			
Australia			
Emerging markets			
China			
India			
Brazil			
Russia			
ASEAN*			
South Africa			
Nigeria			

Highly supportive — Partly supportive — Least supportive

Sources: IATA, Markit, Thomson Reuters Datastream   * Manufacturing PMI

Chart 5 – Passenger load factors by region

● Jul 2019 ● Jul 2018

		Jul 2019	Jul 2018
Industry	All-time Jul low* / All-time Jul high*	85.7%	85.4%
Europe		89.0%	88.8%
N. America		88.8%	87.8%
L. America		85.3%	84.5%
Asia Pacific		83.1%	83.1%
Middle East		81.2%	80.8%
Africa		73.5%	74.8%

Passenger load factors (% of available seat kms, actual)

Sources: IATA Economics, IATA Monthly Statistics   *Data from 1990 onwards

Chart 6 – International RPK growth (airline region of registration basis)

■ Jul 2019 ■ Jun 2019

	Jul 2019	Jun 2019
Industry	2.7%	5.3%
L. America	4.1%	5.8%
Africa	3.6%	9.8%
Europe	3.3%	5.6%
Asia Pacific	2.7%	3.9%
Middle East	1.6%	8.3%
N. America	1.5%	3.5%

International revenue passenger kilometres (% year-on-year)

Sources: IATA Economics, IATA Monthly Statistics

Chart 7 – Domestic RPK growth by market

■ Jul 2019 ■ Jun 2019

	Jul 2019	Jun 2019
Industry	5.2%	4.7%
Domestic China	11.7%	8.9%
Domestic India	8.9%	8.2%
Domestic Russia	6.8%	8.8%
Domestic Japan	4.7%	2.6%
Domestic USA	3.8%	3.6%
Dom. Australia	-0.9%	-0.8%
Domestic Brazil	-6.1%	-5.7%

Domestic revenue passenger kilometres (% year-on-year)

Sources: IATA Economics, IATA Monthly Statistics

Air passenger market detail - July 2019

	World share [1]	July 2019 (% year-on-year)				% year-to-date			
		RPK	ASK	PLF (%-pt) [2]	PLF (level) [3]	RPK	ASK	PLF (%-pt) [2]	PLF (level) [3]
TOTAL MARKET	100.0%	3.6%	3.2%	0.3%	85.7%	4.7%	4.1%	0.5%	82.6%
Africa	2.1%	4.0%	5.8%	-1.3%	73.5%	4.9%	3.8%	0.7%	71.4%
Asia Pacific	34.5%	5.2%	5.1%	0.0%	83.1%	5.1%	4.9%	0.1%	81.9%
Europe	26.8%	3.3%	3.1%	0.2%	89.0%	5.6%	5.3%	0.2%	84.8%
Latin America	5.1%	2.8%	1.8%	0.8%	85.3%	5.2%	3.9%	1.0%	82.8%
Middle East	9.2%	1.3%	0.8%	0.4%	81.2%	1.5%	0.7%	0.7%	76.0%
North America	22.3%	2.7%	1.6%	0.9%	88.8%	4.0%	2.8%	1.0%	85.2%
International	63.9%	2.7%	2.4%	0.2%	85.3%	4.6%	4.0%	0.5%	81.9%
Africa	1.8%	3.6%	6.1%	-1.7%	72.9%	5.0%	3.7%	0.9%	70.8%
Asia Pacific	19.0%	2.7%	2.4%	0.2%	82.6%	4.5%	4.3%	0.2%	81.0%
Europe	23.9%	3.3%	3.2%	0.1%	89.0%	5.9%	5.6%	0.2%	85.2%
Latin America	2.7%	4.1%	2.7%	1.1%	85.6%	4.9%	4.0%	0.7%	83.1%
Middle East	8.9%	1.6%	1.0%	0.4%	81.3%	1.8%	0.8%	0.7%	76.1%
North America	7.6%	1.5%	0.7%	0.7%	87.9%	3.9%	2.6%	1.1%	83.9%
Domestic	36.1%	5.2%	4.7%	0.4%	86.5%	4.8%	4.2%	0.4%	83.8%
Dom. Australia [4]	0.9%	-0.9%	0.1%	-0.8%	82.1%	-0.7%	-0.3%	-0.3%	78.9%
Domestic Brazil [4]	1.1%	-6.1%	-6.9%	0.7%	84.7%	-0.4%	-2.6%	1.8%	82.6%
Dom. China P.R. [4]	9.5%	11.7%	12.3%	-0.4%	84.9%	9.0%	9.3%	-0.2%	84.8%
Domestic India [4]	1.6%	8.9%	7.1%	1.4%	88.3%	6.2%	6.3%	-0.1%	88.2%
Domestic Japan [4]	1.1%	4.7%	5.8%	-0.8%	71.7%	4.0%	3.1%	0.6%	71.4%
Dom. Russian Fed. [4]	1.5%	6.8%	6.3%	0.5%	92.2%	8.7%	8.3%	0.3%	82.3%
Domestic US [4]	14.0%	3.8%	2.6%	1.1%	89.4%	4.4%	3.3%	0.8%	85.9%

[1] % of industry RPKs in 2018   [2] Year-on-year change in load factor   [3] Load factor level

[4] Note: the seven domestic passenger markets for which broken-down data are available account for 30% of global total RPKs and approximately 82% of total domestic RPKs

Note: The total industry and regional growth rates are based on a constant sample of airlines combining reported data and estimates for missing observations. Airline traffic is allocated according to the region in which the carrier is registered; it should not be considered as regional traffic.

STATISTICS

AUG 2019:
Air Passenger Market Analysis

Chart 1 – Air passenger volumes and latest trend

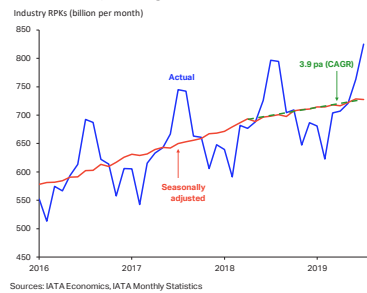Industry RPKs (billion per month)

Actual
3.8 pa (CAGR)
Seasonally adjusted

Sources: IATA Economics, IATA Monthly Statistics

Chart 2 – RPK growth and global business confidence

Diffusion indices / % year-on-year

Growth in industry RPKs (RHS)
Global composite PMI index (adv. 2 months, LHS)

Sources: IATA Economics, IATA Monthly Statistics, Markit
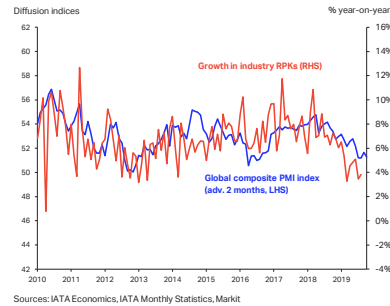
Chart 3 – Economic conditions (monthly data from composite PMIs, selected regions and countries)

Business confidence   Legend: >50 and rising = green; >50 but stable or falling = yellow; <50 = red

World
Developed markets: US, Eurozone, UK, Japan, Australia
Emerging markets: China, India, Brazil, Russia, ASEAN*, South Africa, Nigeria

Highly supportive   Partly supportive   Least supportive

Sources: IATA, Markit, Thomson Reuters Datastream   * Manufacturing PMI
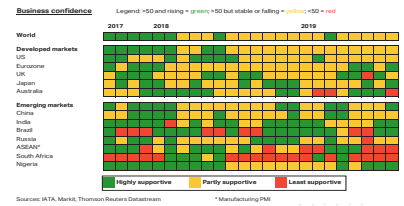
Capacity growth remains slower than demand

Chart 4 – Passenger load factors by region

Aug 2019 / Aug 2018

Industry	85.7% 85.4%
Europe	88.9% 88.7%
N. America	87.5% 86.8%
Asia Pacific	83.9% 84.4%
L. America	83.3% 81.2%
Middle East	82.1% 80.8%
Africa	75.5% 77.0%

Passenger load factors (% of available seat kms, actual)

Sources: IATA Economics, IATA Monthly Statistics   *Data from 1990 onwards
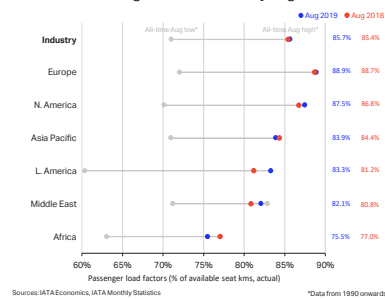
Chart 5 – International RPK growth (airline region of registration basis)

Aug 2019 / Jul 2019

	Aug 2019	Jul 2019
Industry	3.3%	2.8%
Africa	4.1%	3.2%
Europe	3.7%	3.6%
Asia Pacific	3.5%	2.6%
Middle East	2.9%	1.7%
N. America	2.5%	1.4%
L. America	2.3%	4.0%

International revenue passenger kilometres (% year-on-year)

Sources: IATA Economics, IATA Monthly Statistics
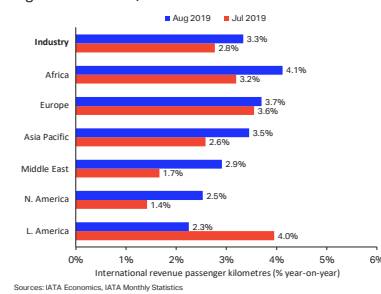
Chart 6 – Domestic RPK growth by market

Aug 2019 / Jul 2019

	Aug 2019	Jul 2019
Industry	4.7%	4.7%
Domestic China	10.1%	11.7%
Domestic Russia	6.0%	6.8%
Domestic USA	3.9%	3.7%
Domestic India	3.7%	3.1%
Domestic Japan	2.1%	5.1%
Dom. Australia	-0.4%	0.7%
Domestic Brazil	-6.1%	-1.4%

Domestic revenue passenger kilometres (% year-on-year)

Sources: IATA Economics, IATA Monthly Statistics
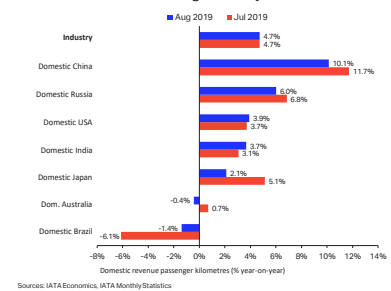
USA, India and Brazil (See Chart 7).

Chart 7 – Domestic passenger load factors by market

Aug 2019 / Aug 2018

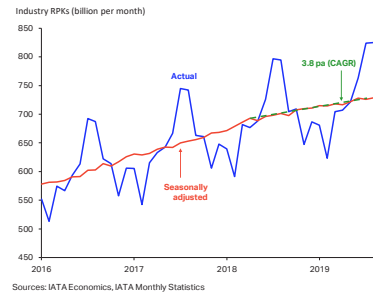|	
Industry	85.9% 85.8%
Domestic Russia	91.0% 91.7%
Domestic China	87.6% 88.7%
Domestic USA	87.1% 86.5%
Domestic India	85.5% 83.6%
Domestic Brazil	82.5% 79.9%
Domestic Japan	80.9% 81.2%
Dom. Australia	79.4% 79.6%

Domestic passenger load factors (% of available seat kms, actual)

Sources: IATA Economics, IATA Monthly Statistics   *Data from 1990 onwards

Air passenger market detail - August 2019

	World share [1]	August 2019 (% year-on-year)				% year-to-date			
		RPK	ASK	PLF (%-pt)[2]	PLF (level)[3]	RPK	ASK	PLF (%-pt)[2]	PLF (level)[3]
TOTAL MARKET	100.0%	3.8%	3.5%	0.3%	85.7%	4.5%	4.0%	0.4%	83.0%
Africa	2.1%	4.0%	6.1%	-1.5%	75.5%	4.7%	4.2%	0.4%	71.9%
Asia Pacific	34.5%	4.9%	5.4%	-0.4%	83.9%	5.0%	5.0%	0.0%	82.2%
Europe	26.8%	3.6%	3.3%	0.2%	88.9%	5.4%	5.1%	0.2%	85.4%
Latin America	5.1%	3.4%	0.8%	2.1%	83.3%	4.9%	3.5%	1.1%	82.9%
Middle East	9.2%	2.6%	1.1%	1.2%	82.1%	1.7%	0.7%	0.7%	76.9%
North America	22.3%	3.1%	2.3%	0.7%	87.5%	3.9%	2.7%	0.9%	85.5%
International	63.9%	3.3%	2.9%	0.3%	85.6%	4.5%	3.9%	0.5%	82.4%
Africa	1.8%	4.1%	6.1%	-1.4%	75.6%	4.8%	4.1%	0.5%	71.5%
Asia Pacific	19.0%	3.5%	3.9%	-0.4%	82.8%	4.5%	4.3%	0.1%	81.2%
Europe	23.9%	3.7%	3.4%	0.2%	89.0%	5.6%	5.4%	0.2%	85.7%
Latin America	2.7%	2.3%	-0.3%	2.1%	83.9%	4.6%	3.5%	0.9%	83.2%
Middle East	8.9%	2.9%	1.3%	1.3%	82.4%	2.0%	0.9%	0.8%	77.0%
North America	7.6%	2.5%	1.3%	1.0%	88.3%	3.7%	2.4%	1.1%	84.5%
Domestic	36.1%	4.7%	4.6%	0.1%	85.9%	4.7%	4.2%	0.4%	84.1%
Dom. Australia [4]	0.9%	-0.4%	-0.2%	-0.2%	79.4%	-0.2%	0.1%	-0.2%	79.1%
Domestic Brazil [4]	1.1%	-1.4%	-4.4%	2.5%	82.5%	-0.5%	-2.8%	1.9%	82.5%
Dom. China P.R. [4]	9.5%	10.1%	11.5%	-1.1%	87.6%	9.2%	9.6%	-0.3%	85.2%
Domestic India [4]	1.6%	3.7%	1.4%	1.9%	85.5%	5.1%	5.1%	0.0%	87.6%
Domestic Japan [4]	1.1%	2.1%	-0.2%	1.9%	80.9%	3.8%	3.1%	0.5%	72.7%
Dom. Russian Fed. [4]	1.5%	6.0%	6.8%	-0.7%	91.0%	8.3%	8.1%	0.1%	83.6%
Domestic US [4]	14.0%	3.9%	3.2%	0.6%	87.1%	4.2%	3.2%	0.8%	86.1%

[1] % of industry RPKs in 2018   [2] Year-on-year change in load factor   [3] Load factor level

[4] Note: the seven domestic passenger markets for which broken-down data are available account for 30% of global total RPKs and approximately 82% of total domestic RPKs

Note: The total industry and regional growth rates are based on a constant sample of airlines combining reported data and estimates for missing observations. Airline traffic is allocated according to the region in which the carrier is registered; it should not be considered as regional traffic.

STATISTICS

MAY 2019: Worldwide Traffic Results
Passenger traffic / Freight volumes
(*Summary*)

TABLE 1: SUMMARY WORLDWIDE TRAFFIC RESULTS, MAY 2019 (% CHANGE)

	May 2019 over May 2018	Year to date 2019	12-month rolling year
PaxFlash			
International passenger	3.6	4.6	5.7
Domestic passenger	2.7	2.9	4.0
Total passenger	3.1	3.6	4.8
FreightFlash			
International freight	(5.1)	(4.7)	(1.3)
Domestic freight	2.4	1.8	2.8
Total freight	(2.8)	(2.7)	(0.1)

TABLE 2: PaxFlash summary – May 2019

Regions	May 2019 % YOY	YTD May 2019 % YOY	YE thru May 2019 % YOY
International passengers			
Africa	0.1	6.7	10.1
Asia-Pacific	4.0	4.3	5.3
Europe	4.0	5.2	6.1
Latin America-Caribbean	4.0	3.6	3.9
Middle East	0.1	1.7	3.2
North America	4.2	5.2	6.0
World	3.6	4.6	5.7
Domestic passengers			
Africa	2.4	4.1	4.9
Asia-Pacific	0.6	1.3	3.5
Europe	0.4	1.3	2.8
Latin America-Caribbean	6.7	6.5	6.4
Middle East	...	...	...
North America	4.4	3.9	4.3
World	2.7	2.9	4.0
Total passengers			
Africa	0.8	6.1	8.5
Asia-Pacific	1.8	2.3	4.1
Europe	3.1	4.1	5.2
Latin America-Caribbean	6.0	5.6	5.6
Middle East	(0.1)	1.6	3.0
North America	4.3	4.1	4.6
World	3.1	3.6	4.8

TRAFFIC TABLE DEFINITIONS:

PASSENGER TRAFFIC: departing + arriving passengers
INTERNATIONAL: traffic performed between the designated airport and an airport in another country/territory
DOMESTIC: traffic performed between two airports located in the same country/territory
TOTAL: international + domestic passengers + direct transit passengers counted once (when breakdown is available)
Year-over-year percentage changes (% YOY) are calculated from a representative sample.

YOY   Year-over-year same month comparison
YTD   Year to date, starting Jan 2019, compared to same period in previous year
YE   Year end, based on a rolling 12-month period, compared to the same prior 12-month perio

MAY 2019: Worldwide Traffic Results
Passenger traffic / Freight volumes
(Summary)

TABLE 3: FreightFlash summary – May 2019			
Regions	May 2019 % YOY	YTD May 2019 % YOY	YE thru May 2019 % YOY
International freight			
Africa	5.7	0.9	7.6
Asia-Pacific	(7.0)	(6.6)	(2.6)
Europe	(1.9)	(3.6)	(1.0)
Latin America-Caribbean	(6.5)	(3.2)	0.8
Middle East	(4.0)	(2.4)	(1.2)
North America	(5.6)	(4.5)	(0.6)
World	(5.1)	(4.7)	(1.3)
Domestic freight			
Africa	...	...	...
Asia-Pacific	(2.0)	(3.2)	0.0
Europe	1.5	2.8	1.7
Latin America-Caribbean	8.0	4.2	7.5
Middle East	...	...	...
North America	4.4	4.2	4.0
World	2.4	1.8	2.8
Total freight			
Africa	(2.9)	1.7	7.9
Asia-Pacific	(5.7)	(5.7)	(2.0)
Europe	(1.8)	(3.4)	(1.0)
Latin America-Caribbean	(2.4)	(1.1)	2.7
Middle East	(4.0)	(1.8)	(0.9)
North America	0.4	0.7	2.3
World	(2.8)	(2.7)	(0.1)

TRAFFIC TABLE DEFINITIONS:

FREIGHT TRAFFIC: loaded and unloaded freight; data in metric tonnes
INTERNATIONAL: traffic performed between the designated airport and an airport in another country/territory
DOMESTIC: traffic performed between two airports located in the same country/territory
TOTAL: international + domestic freight (when breakdown is available)
Note: No domestic freight traffic is reported by airports in the Middle East and Africa regions.
Year-over-year percentage changes (% YOY) are calculated from a representative sample.

YOY   Year-over-year same month comparison
YTD   Year to date, starting Jan 2019, compared to same period in previous year
YE   Year end, based on a rolling 12-month period, compared to same prior 12-month period

JUN 2019: Worldwide Traffic Results

Passenger traffic / Freight volumes
(*Summary*)

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AIRPORTS COUNCIL INTERNATIONAL

Table 1: Summary Worldwide Traffic Results, JUNE 2019 (% change)

	June 2019 over June 2018	Year to date 2019	12-month rolling year
PaxFlash			
International passenger	5.7	4.9	5.5
Domestic passenger	2.3	2.5	3.5
Total passenger	3.9	3.6	4.4
FreightFlash			
International freight	(6.5)	(5.0)	(2.0)
Domestic freight	(1.4)	1.3	2.5
Total freight	(5.1)	(3.2)	(0.7)

TABLE 2: PaxFlash summary – June 2019

Regions	June 2019 % YOY	YTD June 2019 % YOY	YE thru June 2019 % YOY
International passengers			
Africa	13.2	8.3	9.8
Asia-Pacific	5.3	4.6	5.1
Europe	5.7	5.4	6.0
Latin America-Caribbean	5.0	3.9	4.0
Middle East	8.4	2.5	3.0
North America	3.2	4.8	5.6
World	5.7	4.9	5.5
Domestic passengers			
Africa	11.2	5.3	5.1
Asia-Pacific	0.5	0.4	2.4
Europe	1.6	1.4	2.6
Latin America-Caribbean	6.5	6.3	6.5
Middle East	...	...	...
North America	2.9	3.7	4.1
World	2.3	2.5	3.5
Total passengers			
Africa	12.3	7.1	8.3
Asia-Pacific	2.1	1.9	3.3
Europe	4.7	4.3	5.1
Latin America-Caribbean	6.0	5.5	5.6
Middle East	8.1	2.5	2.9
North America	2.9	3.9	4.4
World	3.9	3.6	4.4

TRAFFIC TABLE DEFINITIONS:

PASSENGER TRAFFIC: departing + arriving passengers
INTERNATIONAL: traffic performed between the designated airport and an airport in another country/territory
DOMESTIC: traffic performed between two airports located in the same country/territory
TOTAL: international + domestic passengers + direct transit passengers counted once (when breakdown is available)
Year-over-year percentage changes (% YOY) are calculated from a representative sample.

YOY Year-over-year same month comparison
YTD Year to date, starting Jan 2019, compared to same period in previous year
YE Year end, based on a rolling 12-month period, compared to the same prior 12-month perio

JUN 2019: Worldwide Traffic Results
Passenger traffic / Freight volumes
(Summary)

TABLE 3: FreightFlash summary – June 2019			
Regions	June 2019 % YOY	YTD June 2019 % YOY	YE thru June 2019 % YOY
International freight			
Africa	1.4	1.4	7.0
Asia-Pacific	(7.1)	(6.7)	(3.3)
Europe	(7.0)	(4.6)	(2.0)
Latin America-Caribbean	(5.4)	(3.5)	(0.5)
Middle East	(7.1)	(3.1)	(1.6)
North America	(5.7)	(4.4)	(1.1)
World	(6.5)	(5.0)	(2.0)
Domestic freight			
Africa	...	...	...
Asia-Pacific	(5.0)	(3.6)	(0.7)
Europe	(6.0)	0.9	1.0
Latin America-Caribbean	(8.2)	2.0	5.2
Middle East	...	...	...
North America	1.7	4.1	4.3
World	(1.4)	1.3	2.5
Total freight			
Africa	0.3	1.6	7.0
Asia-Pacific	(6.5)	(5.9)	(2.7)
Europe	(7.0)	(4.4)	2.0
Latin America-Caribbean	(6.3)	(1.9)	1.1
Middle East	(7.1)	(2.7)	(1.4)
North America	(1.5)	0.5	2.1
World	(5.1)	(3.2)	(0.7)

TRAFFIC TABLE DEFINITIONS:

FREIGHT TRAFFIC: loaded and unloaded freight; data in metric tonnes
INTERNATIONAL: traffic performed between the designated airport and an airport in another country/territory
DOMESTIC: traffic performed between two airports located in the same country/territory
TOTAL: international + domestic freight (when breakdown is available)
Note: No domestic freight traffic is reported by airports in the Middle East and Africa regions.
Year-over-year percentage changes (% YOY) are calculated from a representative sample.

YOY   Year-over-year same month comparison
YTD   Year to date, starting Jan 2019, compared to same period in previous year
YE   Year end, based on a rolling 12-month period, compared to same prior 12-month period

JUL 2019: Worldwide Traffic Results

Passenger traffic / Freight volumes
(*Summary*)

TABLE 1: SUMMARY WORLDWIDE TRAFFIC RESULTS, JULY 2019 (% CHANGE)			
	July 2019 over July 2018	Year to date 2019	12-month rolling year
PaxFlash			
International passenger	3.1	4.6	5.2
Domestic passenger	1.6	2.5	3.3
Total passenger	2.3	3.4	4.2
FreightFlash			
International freight	(4.2)	(4.5)	(2.3)
Domestic freight	3.3	1.5	1.9
Total freight	(2.1)	(2.8)	(1.1)

TABLE 2: PaxFlash summary – July 2019			
Regions	July 2019 % YOY	YTD July 2019 % YOY	YE thru July 2019 % YOY
International passengers			
Africa	6.8	7.9	9.9
Asia-Pacific	3.8	4.3	4.6
Europe	3.1	4.9	5.7
Latin America-Caribbean	1.7	3.5	3.7
Middle East	3.2	2.7	2.8
North America	1.0	4.3	5.3
World	3.1	4.6	5.2
Domestic passengers			
Africa	8.2	6.0	5.9
Asia-Pacific	1.8	1.0	2.4
Europe	(0.5)	1.0	2.1
Latin America-Caribbean	2.0	5.1	5.5
Middle East	…	…	…
North America	2.1	3.6	3.9
World	1.6	2.5	3.3
Total passengers			
Africa	7.2	7.2	8.6
Asia-Pacific	2.4	2.2	3.1
Europe	2.2	3.9	4.8
Latin America-Caribbean	1.9	4.5	4.8
Middle East	2.5	2.1	2.4
North America	1.9	3.7	4.1
World	2.3	3.4	4.2

TRAFFIC TABLE DEFINITIONS:

PASSENGER TRAFFIC: departing + arriving passengers
INTERNATIONAL: traffic performed between the designated airport and an airport in another country/territory
DOMESTIC: traffic performed between two airports located in the same country/territory
TOTAL: international + domestic passengers + direct transit passengers counted once (when breakdown is available)
Year-over-year percentage changes (% YOY) are calculated from a representative sample.

YOY   Year-over-year same month comparison
YTD   Year to date, starting Jan 2019, compared to same period in previous year
YE   Year end, based on a rolling 12-month period, compared to the same prior 12-month perio

STATISTICS

JUL 2019: Worldwide Traffic Results
Passenger traffic / Freight volumes
(Summary)

TABLE 3: FreightFlash summary – July 2019			
Regions	**July 2019** **% YOY**	**YTD July 2019** **% YOY**	**YE thru July 2019** **% YOY**
International freight			
Africa	5.0	1.9	7.5
Asia-Pacific	(6.5)	(6.7)	(4.1)
Europe	(1.9)	(3.0)	(1.7)
Latin America-Caribbean	(2.8)	(3.1)	(0.9)
Middle East	(2.0)	(3.0)	(2.0)
North America	(5.6)	(4.3)	(1.5)
World	(4.2)	(4.5)	(2.3)
Domestic freight			
Africa	...	...	...
Asia-Pacific	(0.8)	(3.7)	(2.1)
Europe	5.1	1.0	1.1
Latin America-Caribbean	0.7	2.2	4.8
Middle East	...	...	...
North America	5.7	4.3	4.1
World	3.3	1.5	1.9
Total freight			
Africa	4.9	2.2	7.5
Asia-Pacific	(5.0)	(5.9)	(3.6)
Europe	(1.6)	(2.8)	(1.6)
Latin America-Caribbean	(1.9)	(1.7)	0.6
Middle East	(1.9)	(2.6)	(1.7)
North America	0.8	0.6	1.7
World	(2.1)	(2.8)	(1.1)

TRAFFIC TABLE DEFINITIONS:

FREIGHT TRAFFIC: loaded and unloaded freight; data in metric tonnes
INTERNATIONAL: traffic performed between the designated airport and an airport in another country/territory
DOMESTIC: traffic performed between two airports located in the same country/territory
TOTAL: international + domestic freight (when breakdown is available)
Note: No domestic freight traffic is reported by airports in the Middle East and Africa regions.
Year-over-year percentage changes (% YOY) are calculated from a representative sample.

YOY   Year-over-year same month comparison
YTD   Year to date, starting Jan 2019, compared to same period in previous year
YE   Year end, based on a rolling 12-month period, compared to same prior 12-month period

STATISTICS

ECONOMIC DEVELOPMENT
JUL 2019: Air Transport Monthly Monitor
World Results and Analyses for MAY 2019. Total scheduled services
(Domestic and international)

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http://www.icao.int/sustainability/Pages/Air-Traffic-Monitor.aspx

GLOBAL KEY FIGURES	MAY 2019 *(versus MAY 2018)*	OUTLOOK* - JUN 2019 *(versus JUN 2018)*
	RPK ▲ +4.5% ASK ▲ +2.7% FTK ▼ -3.4% LF: 81.5% ▼ -1.3 pt	ASK ▲ +3.5% * Source OAG

PASSENGER TRAFFIC
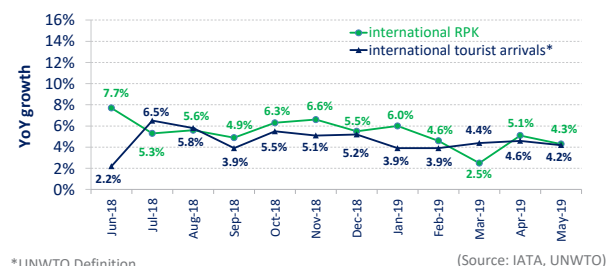
Revenue Passenger-Kilometres - RPK

World passenger traffic grew by +4.5% YoY in May 2019, +0.2 percentage point higher than the growth in the previous month. Although there was a slight improvement, this growth remained to be one of the weakest performances in the last five years. Both Europe and the Middle East posted a slowdown, with the latter experiencing a negative growth, reflecting changes in the airline business in the region. Russian Federation recorded the fastest domestic traffic growth, followed by China and Japan.

(Source: ICAO, IATA, OAG)
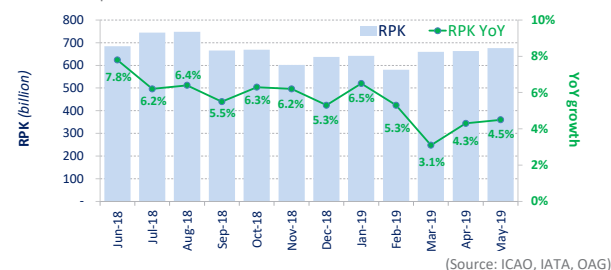
International Traffic vs. Tourist Arrivals

International passenger traffic grew by +4.3% YoY in May 2019, -0.8 percentage point lower than the growth in the previous month. Latin America/Caribbean, Asia/Pacific, and Africa accelerated in traffic growth. Europe, however, experienced the biggest deceleration, followed by the Middle East which became the slowest growing region.

The growth of international tourist arrivals* remained relatively stable.

*UNWTO Definition

(Source: IATA, UNWTO)

CAPACITY

Available Seat-Kilometres - ASK

Capacity worldwide increased by +2.7% YoY in May 2019, -0.9 percentage point lower than the growth in the previous month (+3.6%).

According to the airline schedules, capacity expansion is expected to rise up to +3.5% in June 2019.

(Source: ICAO, IATA, OAG)

Load Factor - LF

The passenger Load Factor reached 81.5% in May 2019, -1.3 percentage points lower than the LF recorded in the previous month.

As traffic growth outpaced the capacity expansion, the May LF was +1.4 percentage points higher compared to the rate in the same period of 2018.

(Source: IATA)

FREIGHT TRAFFIC

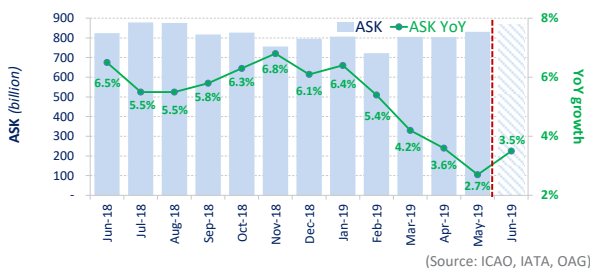### Freight Tonne-Kilometres - FTK

World freight traffic reported a decline of -3.4% YoY in May 2019, +1.3 percentage points higher than the growth in the previous month. Freight traffic started to trend downwards since the end of last year, except for a short-lived growth in March. All regions posted negative growth, except for Africa and Latin America/Caribbean. Africa outperformed other regions, followed by Latin America/Caribbean, albeit with a slight slowdown. Freight growth remained depressing, affected by the global trade tensions. The most significant fall was observed in the Middle East and Asia/Pacific, which together accounted for almost half of world air freight traffic volume.

(Source: IATA)

ACRONYMS: **ACI:** Airports Council International; **ASK:** Available Seat-Kilometres; **IATA:** International Air Transport Association; **FTK:** Freight Tonne-Kilometres; **LF:** Passenger Load Factor; **OAG:** Official Airline Guide; **RPK:** Revenue Passenger-Kilometres; **UNWTO:** World Tourism Organization; **YoY:** Year-on-year; **YTD:** Year-to-date.

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ECONOMIC DEVELOPMENT
ICAO | JUL 2019: Air Transport Monthly Monitor

World Results and Analyses for MAY 2019. Total scheduled services
(Domestic and international)

TOP 15 AIRPORTS (Ranked by aircraft departures, passengers and volume of freight)

MAY 2019: +2.9%, +3.2%, and -3.2% YoY in terms of aircraft departures, passengers and freight for the Top 15

MAY 19

Airports (ranking by number of departures)	Departures	YoY	Airports (ranking by number of passengers)	Passengers*	YoY	Airports (ranking by tonnes of freight)	Freight**	YoY
Atlanta GA, US (ATL)	39,423	1.3%	Atlanta GA, US (ATL)	4,944,960	3.7%	Hong Kong, CN (HKG)	396,000	-7.5%
Chicago IL, US (ORD)	39,309	2.8%	Beijing, CN (PEK)	4,115,961	-1.4%	Memphis TN, US (MEM)	379,192	-0.9%
Dallas/Fort Worth TX, US (DFW)	30,702	7.8%	Los Angeles CA, US (LAX)	3,806,725	0.9%	Shanghai, CN (PVG)	299,695	-6.1%
Los Angeles CA, US (LAX)	29,117	-4.0%	Chicago IL, US (ORD)	3,731,773	3.0%	Anchorage AK, US (ANC)	236,672	-2.5%
Denver CO, US (DEN)	26,821	7.2%	Tokyo, JP (HND)	3,483,952	-2.6%	Louisville KY, US (SDF)	226,884	8.5%
Charlotte NC, US (CLT)	24,607	2.8%	London, GB (LHR)	3,384,685	1.3%	Incheon, KR (ICN)	220,756	-8.1%
Beijing, CN (PEK)	24,392	-6.4%	Shanghai, CN (PVG)	3,282,392	6.7%	Dubai, AE (DXB)	194,082	-12.3%
Amsterdam, NL (AMS)	23,256	0.2%	Dallas/Fort Worth TX, US (DFW)	3,278,296	9.9%	Miami FL, US (MIA)	190,152	2.2%
Frankfurt, DE (FRA)	23,091	1.0%	Paris, FR (CDG)	3,230,426	6.2%	Doha, QA (DOH)	189,778	2.9%
Paris, FR (CDG)	21,927	4.9%	Amsterdam, NL (AMS)	3,220,737	0.6%	Taipei, CN (TPE)	182,784	-6.4%
Shanghai, CN (PVG)	21,912	2.7%	Frankfurt, DE (FRA)	3,112,863	1.5%	Frankfurt, DE (FRA)	174,849	0.6%
Las Vegas NV, US (LAS)	21,059	6.3%	Hong Kong, HK (HKG)	3,110,500	3.2%	Singapore, SG (SIN)	171,800	-4.8%
London, GB (LHR)	20,868	1.0%	Denver CO, US (DEN)	3,020,928	9.6%	Los Angeles CA, US (LAX)	171,062	-6.2%
Houston TX, US (IAH)	20,174	5.3%	Incheon, KR (ICN)	2,911,455	6.8%	Beijing, CN (PEK)	167,587	-3.0%
Phoenix AZ, US (DVT)	20,166	17.6%	Guangzhou, CN (CAN)	2,880,808	2.0%	Paris, FR (CDG)	167,000	3.1%

Note: Total scheduled and non-scheduled services

(Source: ACI)

In terms of **aircraft departures**, the Top 15 airports reported a growth of **+2.9%** YoY. Thirteen out of the Top 15 airports posted YoY increases. **Atlanta** remained at **1st** with a modest growth of **+1.3%**. The strongest growth in operations was recorded by **Phoenix** at **+17.6%**, followed by **Dallas/Fort Worth** at **+7.8%**.

In terms of **passengers**, the Top 15 airports reported a growth of **+3.2%** YoY. All the Top 15 airports posted YoY increases, except for **Beijing** and **Tokyo** with a decline of **-1.4%** and **-2.6%**, respectively. **Atlanta** remained **1st** with a growth of **+3.7%**. The highest growth was reported by **Dallas/Fort Worth** at **+9.9%**, followed by **Denver** at **+9.6%**.

In terms of **freight**, the Top 15 airports reported a decline of **-3.2%** YoY. Ten out of the Top 15 airports posted YoY declines, mostly in Asia/Pacific and North America. The sharpest decrease was posted by **Dubai** (**-12.3%**), followed by **Incheon** (**-8.1%**) and **Hong Kong** (**-7.5%**). **Louisville** outperformed the other major freight hubs and was up by **+8.5%**.

TOP 15 AIRLINE GROUPS (Ranked by RPK)

MAY 2019: +5.0% YoY in terms of RPK for the Top 15

In terms of RPK, the Top 15 airline groups accounted for 48.7% of world total RPK in May 2019 and grew by +5.0% YoY. This growth was +0.5 percentage point higher than the world average on scheduled services. Twelve out of the Top 15 airline groups posted YoY increases.

For the third consecutive time, **Delta** ranked **1st** with a solid growth of **+7.0%**, followed by **United**, rising at **+4.3%** YoY. **American** continued to be **3rd** with a marginal growth of **+0.8%**. **Southwest** slipped at **-0.8%** and remained at **10th**.

Emirates continued to trend downwards with a negative growth of **-9.5%** and dropped by 2 positions to **8th**. **Qatar** recorded the highest growth among the Top 15 airlines for the second time this year, at a staggering **+18.6%**, albeit remained at **13th**.

Lufthansa and **AF-KLM** grew modestly by **+5.8%** and **+4.8%**, and remained **4th** and **5th**, respectively. **IAG** recorded a solid growth at **+6.0%** and elevated by 1 position to **6th**. **Ryanair** posted the second-highest growth among the Top 15 at **+12.5%** albeit remained at **12th**. **Turkish Airlines** remained unchanged and retained its position.

China Southern recorded a solid growth at **+9.5%** and ranked 1 position up to **7th**. **Air China**, **China Eastern** and **Singapore Airlines** grew solidly by **+8.4%**, **+11.4%** and **+8.0%**, and remained at **9th**, **11th** and **15th**, respectively.

MAY 19

	RPK (billion)	YoY	% Share of World Total	Cumulative % Share
Delta	33.9	7.0%	5.0%	5.0%
United[1]	33.1	4.3%	4.9%	9.9%
American[1]	32.8	0.8%	4.9%	14.8%
Lufthansa Group[2]	26.2	5.8%	3.9%	18.6%
AF-KLM	25.1	4.8%	3.7%	22.4%
IAG[3]	24.8	6.0%	3.7%	26.0%
China Southern	22.7	9.5%	3.4%	29.4%
Emirates	20.1	-9.5%	3.0%	32.4%
Air China	19.4	8.4%	2.9%	35.2%
Southwest[1]	18.7	-0.8%	2.8%	38.0%
China Eastern	18.3	11.4%	2.7%	40.7%
Ryanair	17.4	12.5%	2.6%	43.3%
Qatar Airways	12.8	18.6%	1.9%	45.2%
Turkish Airlines	12.2	0.0%	1.8%	47.0%
Singapore Airlines Group	11.8	8.0%	1.8%	48.7%
Top 15 Total RPKs	**329 billion**	**5.0%**	**48.7%**	
World Total RPKs	**676 billion**	**4.5%**	**100.0%**	

(Source: ICAO, airlines' websites)

Note: Total scheduled and non-scheduled services

CAPACITY BY REGION *(ICAO Statistical Regions)*

MAY 2019: +2.7% YoY in terms of World ASK

% Share of Capacity by Region

- 5.0%
- 2.3%
- 9.8%
- 32.2% Asia/Pacific
- 23.2%
- 27.4%
- Europe
- North America
- Middle East
- Latin America/Caribbean
- Africa

(Source: ICAO, IATA, OAG)
Note: Total scheduled services

+3.2% YoY +3.6% YTD (North America)
+4.6% YoY +6.3% YTD (Europe)
+3.5% YoY +4.7% YTD (Asia and Pacific)
-5.9% YoY 0.0% YTD (Middle East)
+0.3% YoY +1.2% YTD (Africa)
+2.8% YoY +4.8% YTD (Latin America and the Caribbean)

World: +2.7% YoY +4.3% YTD
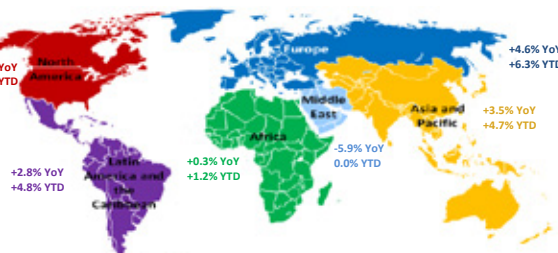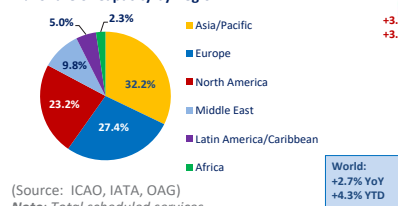
Worldwide capacity expanded by **+2.7%** YoY in May 2019. All regions posted a slowdown in capacity expansion, except for minor acceleration in the **Asia/Pacific**. Despite the deceleration, **Europe** continued to be the fastest-growing region. For the second consecutive month, the **Middle East** was the only region posting negative capacity growth resulting in a unchanged YTD capacity expansion, the slowest among all regions.

ECONOMIC DEVELOPMENT
AUG 2019: Air Transport Monthly Monitor

ICAO

World Results and Analyses for JUN 2019. Total scheduled services
(Domestic and international)

http://www.icao.int/sustainability/Pages/Air-Traffic-Monitor.aspx

Air Transport Bureau
E-mail: ecd@icao.int

GLOBAL KEY FIGURES	JUN 2019 *(versus JUN 2018)*	OUTLOOK* - JUL 2019 *(versus JUL 2018)*
	RPK ▲ +5.0% ASK ▲ +3.3% FTK ▼ -4.8% LF: 84.4% ▲ +2.9 pt	ASK ▲ +3.5% * Source OAG

PASSENGER TRAFFIC

Revenue Passenger-Kilometres - RPK

World passenger traffic grew by +5.0% YoY in June 2019, +0.5 percentage point higher than the growth in the previous month. This growth indicated continuous recovery since the sharp slowdown observed in March, although remained below the average pace in the last twelve months. All regions recorded improvements in growth with the most notable acceleration in Africa and the Middle East, respectively. Russian Federation continued to record the fastest domestic traffic growth, followed by China and India.
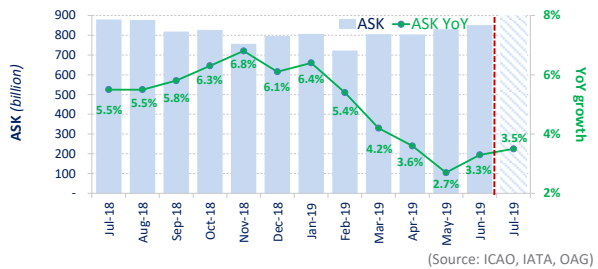

(Source: ICAO, IATA, OAG)

International Traffic vs. Tourist Arrivals

International passenger traffic grew by +5.4% YoY in June 2019, +1.1 percentage points higher than the growth in the previous month. Both Africa and the Middle East posted significant recovery and became the fastest growing regions.

The growth of international tourist arrivals* remained relatively stable.

*UNWTO Definition

(Source: IATA, UNWTO)
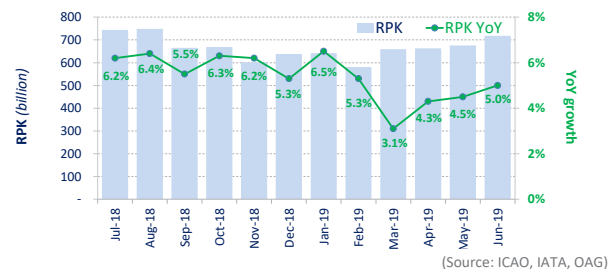
CAPACITY

Available Seat-Kilometres - ASK

Capacity worldwide increased by +3.3% YoY in June 2019, +0.6 percentage point higher than the growth in the previous month (+2.7%).
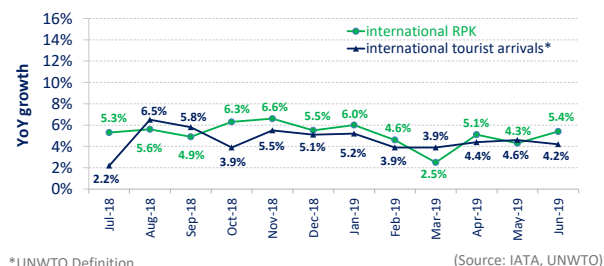
According to the airline schedules, capacity expansion is expected to rise up to +3.5% in July 2019.

(Source: ICAO, IATA, OAG)

Load Factor - LF

The passenger Load Factor reached 84.4% in June 2019, +2.9 percentage points higher than the LF recorded in the previous month.

As traffic growth outpaced the capacity expansion, the June LF was +1.6 percentage points higher compared to the rate in the same period of 2018.
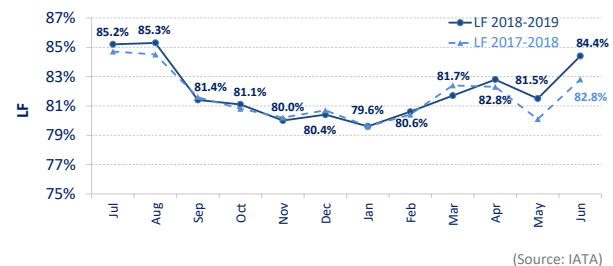
(Source: IATA)

FREIGHT TRAFFIC

Freight Tonne-Kilometres - FTK

World freight traffic reported a decline of -4.8% YoY in June 2019, -1.4 percentage points lower than the growth in the previous month. Freight traffic continued to trend downwards and reached its lowest level in the last twelve months, reflecting the global trade tensions. All regions posted negative growth, except for Africa, which remained as the fastest-growing region, albeit with a slight slowdown compared to a month ago. For the second-consecutive time, the Middle East experienced the most substantial fall and posted the weakest performance. This was followed by the three biggest freight regions, Asia/Pacific, North America and Europe.
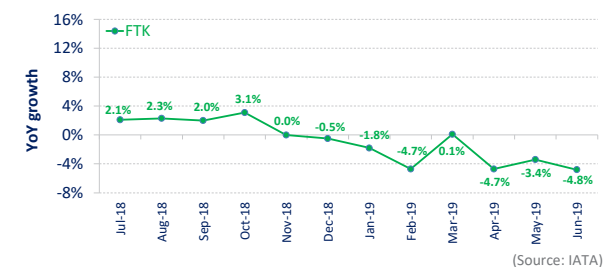
(Source: IATA)

ACRONYMS: **ACI:** Airports Council International; **ASK:** Available Seat-Kilometres; **IATA:** International Air Transport Association; **FTK:** Freight Tonne-Kilometres; **LF:** Passenger Load Factor; **OAG:** Official Airline Guide; **RPK:** Revenue Passenger-Kilometres; **UNWTO:** World Tourism Organization; **YoY:** Year-on-year; **YTD:** Year-to-date.

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ECONOMIC DEVELOPMENT
AUG 2019: Air Transport Monthly Monitor
World Results and Analyses for JUN 2019. Total scheduled services
(Domestic and international)

TOP 15 AIRPORTS (Ranked by aircraft departures, passengers and volume of freight)

JUN 2019: +1.6%, +2.9%, and -4.6% YoY in terms of aircraft departures, passengers and freight for the Top 15

JUN 19

Airports (ranking by number of departures)	Departures	YoY	Airports (ranking by number of passengers)	Passengers*	YoY	Airports (ranking by tonnes of freight)	Freight**	YoY
Chicago IL, US (ORD)	40,299	▲ 2.8%	Atlanta GA, US (ATL)	4,971,119	▲ 4.0%	Hong Kong, CN (HKG)	379,000	▼ -8.9%
Atlanta GA, US (ATL)	39,140	▲ 0.7%	Beijing, CN (PEK)	4,048,776	▼ -1.0%	Memphis TN, US (MEM)	347,629	▼ -7.5%
Dallas/Fort Worth TX, US (DFW)	31,072	▲ 5.8%	Los Angeles CA, US (LAX)	4,017,784	▲ 0.3%	Shanghai, CN (PVG)	292,457	▼ -4.6%
Los Angeles CA, US (LAX)	29,564	▼ -3.3%	Chicago IL, US (ORD)	3,973,783	▲ 2.9%	Anchorage AK, US (ANC)	238,197	▲ 2.7%
Denver CO, US (DEN)	27,781	▲ 5.3%	London, GB (LHR)	3,623,202	▲ 1.7%	Louisville KY, US (SDF)	221,036	▲ 9.1%
Beijing, CN (PEK)	24,378	▼ -2.1%	Tokyo, JP (HND)	3,557,511	▲ 1.6%	Incheon, KR (ICN)	220,322	▼ -7.0%
Charlotte NC, US (CLT)	24,092	▲ 7.0%	Dubai, AE (DXB)	3,541,771	▲ 4.2%	Dubai, AE (DXB)	192,344	▼ -10.4%
Frankfurt, DE (FRA)	22,936	▲ 1.4%	Paris, FR (CDG)	3,458,604	▲ 6.5%	Tokyo, JP (NRT)	174,068	▼ -3.7%
Amsterdam, NL (AMS)	22,625	▼ -0.1%	Dallas/Fort Worth TX, US (DFW)	3,419,787	▲ 5.8%	Doha, QA (DOH)	173,341	▼ -2.8%
Paris, FR (CDG)	22,118	▲ 3.6%	Frankfurt, DE (FRA)	3,290,122	▲ 3.4%	Taipei, CN (TPE)	173,283	▼ -9.8%
Shanghai, CN (PVG)	21,306	▲ 2.1%	Amsterdam, NL (AMS)	3,251,294	▲ 1.8%	Miami FL, US (MIA)	168,980	▲ 5.6%
London, GB (LHR)	20,501	▲ 1.2%	Shanghai, CN (PVG)	3,241,049	▲ 3.9%	Los Angeles CA, US (LAX)	166,242	▼ -8.0%
San Francisco CA, US (SFO)	20,137	▼ -1.9%	Denver CO, US (DEN)	3,193,460	▲ 8.2%	Frankfurt, DE (FRA)	165,169	▼ -4.8%
Seattle WA, US (SEA)	20,104	▲ 1.0%	Hong Kong, CN (HKG)	3,163,500	▲ 2.1%	Beijing, CN (PEK)	162,320	▼ -5.0%
Houston TX, US (IAH)	19,853	▼ -0.5%	Istanbul, TR (IST)	3,049,170	▶ 0.0%	Singapore, SG (SIN)	161,900	▼ -5.0%

Note: Total scheduled and non-scheduled services

(Source: ACI)

In terms of **aircraft departures**, the Top 15 airports reported a growth of +1.6% YoY. Ten out of the Top 15 airports posted YoY increases. **Chicago** ranked **1st** with a modest growth of **+2.8%.** The strongest growth in operations was recorded by **Charlotte** at **+7.0%,** followed by **Dallas/Fort Worth** at **+5.8%.**

In terms of **passengers**, the Top 15 airports reported a growth of +2.9% YoY. Thirteen out of the Top 15 airports posted YoY increases, except for **Beijing** with a decrease of **-1.0%** and **Istanbul** with no growth. **Atlanta** remained **1st** with a growth of **+4.0%.** The highest growth was reported by **Denver** at **+8.2%,** followed by **Paris** at **+6.5%.**

In terms of **freight**, the Top 15 airports reported a decline of -4.6% YoY. All the Top 15 airports posted negative growth, except three hubs in North America. The sharpest decrease was posted by **Dubai** (-10.4%), followed by **Taipei** (-9.8%) and **Hong Kong** (-8.9%). **Louisville** continued to grow strongly and was up by **+9.1%.**

TOP 15 AIRLINE GROUPS (Ranked by RPK)

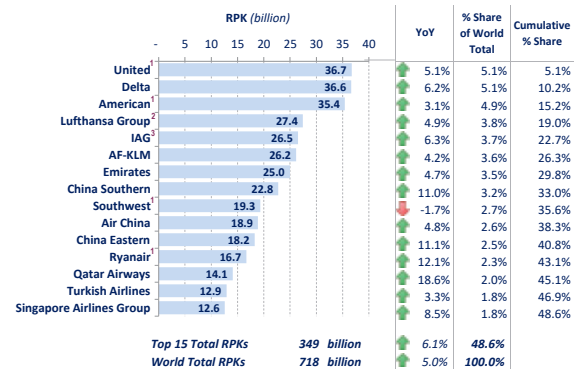**JUN 2019:** +5.7% YoY in terms of RPK for the Top 15

In terms of RPK, the Top 15 airline groups accounted for 48.6% of world total RPK in June 2019 and grew by +5.7% YoY. This growth was +0.7 percentage point higher than the world average on scheduled services. Thirteen out of the Top 15 airline groups posted YoY growth.

For the first time this year, **United** ranked **1st** with a growth of **+5.1%,** followed by **Delta**, rising at **+6.2%** YoY. **American** continued to be **3rd** with a moderate growth of **+3.1%.** Southwest dropped by **-1.7%,** however scaled 1 position up at **9th.**

Emirates posted a growth of 4.7% and ascended 1 position to **7th.** For a third-consecutive month, **Qatar Airways** recorded the highest growth among the Top 15 airlines at **+18.6%** while remained at **13th.**

Lufthansa retained its position of **4th** with a growth of **+4.9%.** With an increase of **+6.3%,** IAG elevated 1 position to **5th.** AF-KLM grew modestly at **4.2%** and dropped 1 position to **6th.** Ryanair continued to grow strongly by **+12.1%** while remained at **12th.** With a relatively slower growth of **+3.3%,** Turkish Airlines ranked **14th.**

Both **China Southern** and **China Eastern** grew strongly with double-digit growth while remained at the position of **8th** and **11th.** With a moderate increase of **+4.8%,** Air China ranked 1 position down to **10th.** Singapore Airlines grew solidly by **+8.5%,** and remained at **8th.**

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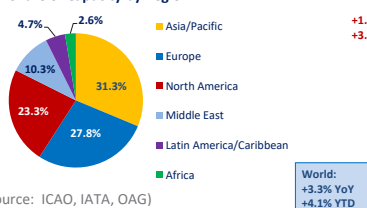|	RPK (billion)	YoY	% Share of World Total	Cumulative % Share
United[1]	36.7	▲ 5.1%	5.1%	5.1%
Delta	36.6	▲ 6.2%	5.1%	10.2%
American[1]	35.4	▲ 3.1%	4.9%	15.2%
Lufthansa Group[2]	27.4	▲ 4.9%	3.8%	19.0%
IAG[3]	26.5	▲ 6.3%	3.7%	22.7%
AF-KLM	26.2	▲ 4.2%	3.6%	26.3%
Emirates	25.0	▲ 4.7%	3.5%	29.8%
China Southern	22.8	▲ 11.0%	3.2%	33.0%
Southwest[1]	19.3	▼ -1.7%	2.7%	35.6%
Air China	18.9	▲ 4.8%	2.6%	38.3%
China Eastern	18.2	▲ 11.1%	2.5%	40.8%
Ryanair[1]	16.7	▲ 12.1%	2.3%	43.1%
Qatar Airways	14.1	▲ 18.6%	2.0%	45.1%
Turkish Airlines	12.9	▲ 3.3%	1.8%	46.9%
Singapore Airlines Group	12.6	▲ 8.5%	1.8%	48.6%
Top 15 Total RPKs	**349 billion**	▲ 6.1%	**48.6%**	
World Total RPKs	**718 billion**	▲ 5.0%	**100.0%**	

(Source: ICAO, airlines' websites)

Note: Total scheduled and non-scheduled services

CAPACITY BY REGION *(ICAO Statistical Regions)*

JUN 2019: +3.3% YoY in terms of World ASK

% Share of Capacity by Region

- Asia/Pacific 31.3%
- Europe 27.8%
- North America 23.3%
- Middle East 10.3%
- Latin America/Caribbean 4.7%
- Africa 2.6%

North America: +1.4% YoY / +3.0% YTD
Europe: +4.6% YoY / +5.8% YTD
Middle East: +1.5% YoY / +0.3% YTD
Asia and Pacific: +4.0% YoY / +4.7% YTD
Latin America and the Caribbean: +1.2% YoY / +4.3% YTD
Africa: +7.7% YoY / +2.7% YTD

World: +3.3% YoY / +4.1% YTD

(Source: ICAO, IATA, OAG)
Note: Total scheduled services

Worldwide capacity expanded by **+3.3%** YoY in June 2019. All regions posted growth in capacity expansion, with the most notable acceleration in **Africa.** However, a slight slowdown was reported by **Latin America/Caribbean** and **North America,** making them the slowest growing regions in their respective order.

Africa, followed by **Europe** became the regions with the fastest capacity expansion.

* Embarked Passengers   ** Loaded and Unloaded Freight in Tonnes   1. ICAO estimates   2. Lufthansa Airlines, Eurowings, SWISS, Austrian Airlines, Brussels Airlines, Sun Express, and Lufthansa Cargo   3. British Airways, Aer Lingus, Iberia, and Vueling

ACRONYMS: **ACI:** Airports Council International;   **ASK:** Available Seat-Kilometres;   **IATA:** International Air Transport Association;   **FTK:** Freight Tonne-Kilometres;   **LF:** Passenger Load Factor;   **OAG:** Official Airline Guide;   **RPK:** Revenue Passenger-Kilometres;   **UNWTO:** World Tourism Organization;   **YoY:** Year-on-year;   **YTD:** Year-to-date.

STATISTICS

ECONOMIC DEVELOPMENT
SEP 2019: Air Transport Monthly Monitor
World Results and Analyses for JUL 2019. Total scheduled services
(Domestic and international)

ICAO · OACI · ИКАО | ICAO

GLOBAL KEY FIGURES	JUL 2019 *(versus JUL 2018)*	OUTLOOK* - AUG 2019 *(versus AUG 2018)*
	RPK ▲ +3.6% ASK ▲ +3.2% FTK ▼ -3.2% LF: 85.7% ▲ +1.3 pt	ASK ▲ +3.4% * Source OAG

PASSENGER TRAFFIC

Revenue Passenger-Kilometres - RPK

World passenger traffic grew by +3.6% YoY in July 2019, -1.4 percentage points lower than the growth in the previous month. Growth momentum again softened after a recent steady recovery, and reached its second slowest level during the year. All regions, except for Asia/Pacific, eased the growth rates. The most significant slowdown was observed in Africa and the Middle East; and the latter became the weakest performing region. China regained the fastest growing domestic market, followed by India and the Russian Federation.
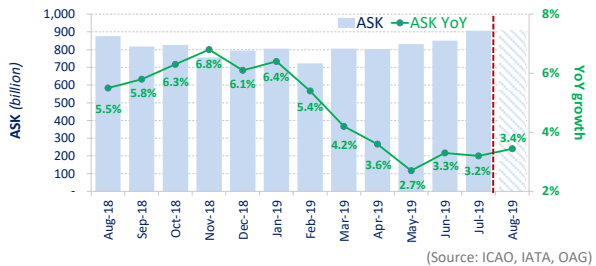

(Source: ICAO, IATA, OAG)

International Traffic vs. Tourist Arrivals

International passenger traffic grew by +2.7% YoY in July 2019, -2.7 percentage points lower than the growth in the previous month. All regions experienced deceleration in traffic growth, with the most notable slowdown in Africa and the Middle East. North America continued to be the slowest growing region.

The growth of international tourist arrivals* remained relatively stable.

*UNWTO Definition

(Source: IATA, UNWTO)

CAPACITY

Available Seat-Kilometres - ASK

Capacity worldwide increased by +3.2% YoY in July 2019, -0.1 percentage point lower than the growth in the previous month (+3.3%).
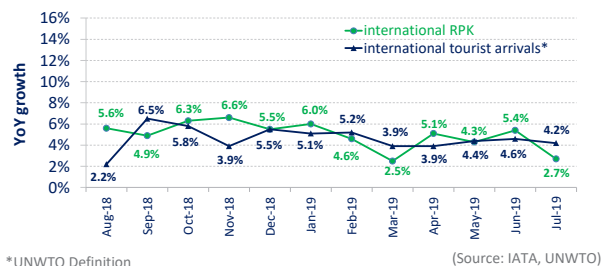
According to the airline schedules, capacity expansion is expected to up slightly to +3.4% in August 2019.

(Source: ICAO, IATA, OAG)

Load Factor - LF

The passenger Load Factor reached 85.7% in July 2019, +1.3 percentage points higher than the LF recorded in the previous month.

As traffic growth outpaced the capacity expansion, the July LF was +0.5 percentage point higher compared to the rate in the same period of 2018.
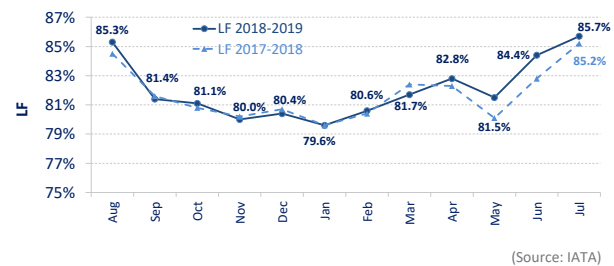
(Source: IATA)

FREIGHT TRAFFIC

Freight Tonne-Kilometres - FTK

World freight traffic reported a decline of -3.2% YoY in July 2019, +1.6 percentage points higher than the growth in the previous month. Despite the improvement, freight traffic growth remained negative reflecting the stagnant world trade. Weakness in freight growth has been broad-based, with all regions posting YoY decline, except for Africa and Latin America/Caribbean. Africa demonstrated an outstanding performance and recorded a robust double-digit growth. For the third-consecutive month, the Middle East experienced the most sluggish growth, followed by Asia/Pacific. The two other major freight regions, Europe and North America also showed subdued performance.
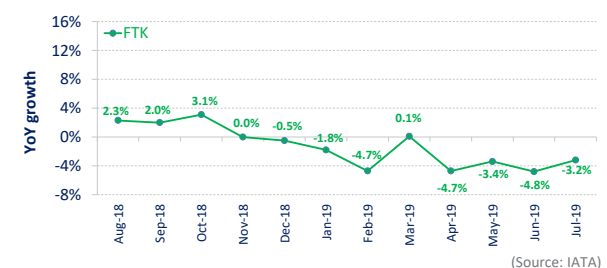
(Source: IATA)

ACRONYMS: **ACI:** Airports Council International;   **ASK:** Available Seat-Kilometres;   **IATA:** International Air Transport Association;   **FTK:** Freight Tonne-Kilometres;   **LF:** Passenger Load Factor;   **OAG:** Official Airline Guide;   **RPK:** Revenue Passenger-Kilometres;   **UNWTO:** World Tourism Organization;   **YoY:** Year-on-year;   **YTD:** Year-to-date.

STATISTICS

ICAO | ECONOMIC DEVELOPMENT
SEP 2019: Air Transport Monthly Monitor
World Results and Analyses for JUL 2019. Total scheduled services
(Domestic and international)

TOP 15 AIRPORTS (Ranked by aircraft departures, passengers and volume of freight)

JUL 2019: +2.2%, +1.9%, and -2.2% YoY in terms of aircraft departures, passengers and freight for the Top 15

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Airports (ranking by number of departures)	Departures	YoY	Airports (ranking by number of passengers)	Passengers*	YoY	Airports (ranking by tonnes of freight)	Freight**	YoY
Chicago IL, US, (ORD)	42,192	2.8%	Atlanta GA, US, (ATL)	5,108,142	3.4%	Hong Kong, HK, (HKG)	392,000	-7.7%
Atlanta GA, US, (ATL)	40,292	1.3%	Beijing, CN, (PEK)	4,386,755	2.1%	Memphis TN, US, (MEM)	346,955	-1.8%
Dallas/Fort Worth TX, US, (DFW)	32,518	8.0%	Los Angeles CA, US, (LAX)	4,234,908	0.5%	Shanghai, CN, (PVG)	302,721	-3.2%
Los Angeles CA, US, (LAX)	31,001	-1.7%	Chicago IL, US, (ORD)	4,089,349	1.4%	Anchorage AK, US, (ANC)	262,838	6.5%
Denver CO, US, (DEN)	29,450	8.4%	Dubai, AE, (DXB)	4,003,615	-2.5%	Louisville KY, US, (SDF)	233,230	18.9%
Beijing, CN, (PEK)	25,611	-1.2%	London, GB, (LHR)	3,877,248	-0.8%	Incheon, KR, (ICN)	222,840	-8.7%
Charlotte NC, US, (CLT)	24,542	3.2%	Paris, FR, (CDG)	3,714,154	3.9%	Dubai, AE, (DXB)	217,642	-2.6%
Frankfurt, DE, (FRA)	23,563	1.0%	Tokyo, JP, (HND)	3,598,902	-0.7%	Doha, QA, (DOH)	183,942	1.3%
Paris, FR, (CDG)	23,481	3.3%	Dallas/Fort Worth TX, US, (DFW)	3,576,115	8.4%	Taipei, TW, (TPE)	179,908	-10.6%
Amsterdam, NL, (AMS)	23,214	-1.8%	Frankfurt, DE, (FRA)	3,460,198	0.8%	Tokyo, JP, (NRT)	177,000	0.7%
Shanghai, CN, (PVG)	22,389	3.7%	Shanghai, CN, (PVG)	3,412,972	4.6%	Singapore, SG, (SIN)	170,200	-7.2%
Seattle WA, US, (SEA)	21,382	0.8%	Denver CO, US, (DEN)	3,366,163	10.0%	Frankfurt, DE, (FRA)	168,773	1.4%
San Francisco CA, US, (SFO)	21,158	-0.5%	Amsterdam, NL, (AMS)	3,362,012	-0.7%	Los Angeles CA, US, (LAX)	163,633	-7.7%
London, GB, (LHR)	21,117	0.6%	Hong Kong, HK, (HKG)	3,358,000	1.0%	Miami FL, US, (MIA)	162,490	1.7%
Guangzhou, CN, (CAN)	20,909	4.0%	Istanbul, TR, (IST)	3,195,627	0.0%	Beijing, CN, (PEK)	161,318	-6.6%

Note: Total scheduled and non-scheduled services

(Source: ACI)

In terms of **aircraft departures**, the Top 15 airports reported a growth of +2.2% YoY. Eleven out of the Top 15 airports posted YoY increases. **Chicago** ranked **1st** with a modest growth of +2.8%. The strongest growth in operations was recorded by **Denver** at +8.4%, followed by **Dallas/Fort Worth** at +8.0%.

In terms of **passengers**, the Top 15 airports reported a growth of +1.9% YoY. Ten out of the Top 15 airports posted YoY increases. **Atlanta** remained **1st** with a growth of +3.4%. **Denver** recorded a sharp increase at +10.0%, driven by solid economy in the area such as business expansion of Amazon. **Dubai** posted a decline of -2.5%, in line with the performance of major airline in the region.

In terms of **freight**, the Top 15 airports reported a decline of -2.2% YoY. More than half of the Top 15 airports posted negative growth. Significant drops were observed in major hubs in Asia/Pacific with **Taipei** and **Incheon** contracting -10.6% and -8.7%, respectively. **Louisville** continued to grow robustly at +18.9%, indicating the strengthening of its hub position of UPS.

TOP 15 AIRLINE GROUPS (Ranked by RPK)

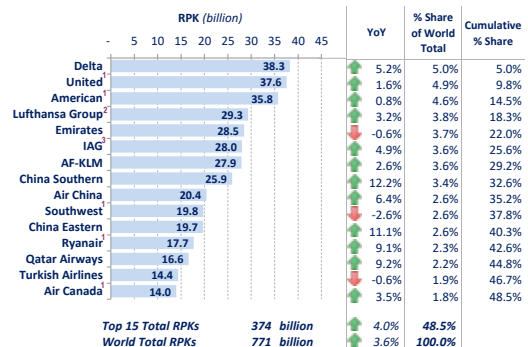**JUL 2019: +4.0% YoY in terms of RPK for the Top 15**

In terms of RPK, the Top 15 airline groups accounted for 48.5% of the world's total RPK in July 2019 and grew by +4.0% YoY. This growth was +0.4 percentage point higher than the world's average on scheduled services. Twelve out of the Top 15 airline groups posted YoY growth.

Delta ranked over United becoming **1st** with a solid growth of +5.2%. Followed were **United** and **American**, growing modestly at +1.6% and +0.8%, respectively. **Southwest** continued to post a decline and was 1 position down to **10th**. For the first time this year, **Air Canada** made its way to the Top 15 airline groups and ranked **15th** with a growth of +3.5%.

Despite a negative growth of -0.6%, **Emirates** was up two positions to **5th**. **Qatar Airways** continued to grow strongly at +9.2% and remained at **13th**.

Lufthansa retained its position of **4th** and rose +3.2%. Both **IAG** and **AF-KLM** dropped 1 position to **6th** and **7th**, and grew moderately at +4.9% and +2.6%, respectively. **Ryanair** continued to show strong growth at +9.1% while stayed at **12th**. **Turkish Airlines** remained at **14th**, albeit contracted by -0.6%.

For the second consecutive month, both **China Southern** and **China Eastern** recorded double-digit growth and became the fastest growing Top15 airlines at the position of **8th** and **11th**. With a solid increase of +6.4%, **Air China** ranked 1 position up to **9th**.
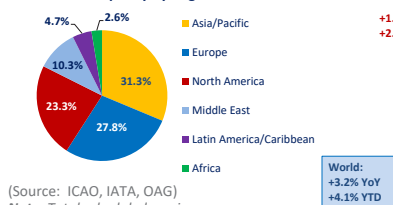
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	RPK (billion)	YoY	% Share of World Total	Cumulative % Share
Delta	38.3	5.2%	5.0%	5.0%
United[1]	37.6	1.6%	4.9%	9.8%
American[1]	35.8	0.8%	4.6%	14.5%
Lufthansa Group[2]	29.3	3.2%	3.8%	18.3%
Emirates	28.5	-0.6%	3.7%	22.0%
IAG[3]	28.0	4.9%	3.6%	25.6%
AF-KLM	27.9	2.6%	3.6%	29.2%
China Southern	25.9	12.2%	3.4%	32.6%
Air China	20.4	6.4%	2.6%	35.2%
Southwest[1]	19.8	-2.6%	2.6%	37.8%
China Eastern	19.7	11.1%	2.6%	40.3%
Ryanair[1]	17.7	9.1%	2.3%	42.6%
Qatar Airways	16.6	9.2%	2.2%	44.8%
Turkish Airlines	14.4	-0.6%	1.9%	46.7%
Air Canada[1]	14.0	3.5%	1.8%	48.5%

			YoY	% Share	Cumulative
Top 15 Total RPKs	374	billion	4.0%	48.5%	
World Total RPKs	771	billion	3.6%	100.0%	

(Source: ICAO, airlines' websites)

Note: Total scheduled and non-scheduled services

CAPACITY BY REGION *(ICAO Statistical Regions)*

JUL 2019: +3.2% YoY in terms of World ASK

% Share of Capacity by Region

4.7%
2.6%
10.3%
23.3%
27.8%
31.3%

- Asia/Pacific
- Europe
- North America
- Middle East
- Latin America/Caribbean
- Africa

(Source: ICAO, IATA, OAG)
Note: Total scheduled services

North America: +1.6% YoY, +2.8% YTD
Europe: +3.1% YoY, +5.3% YTD
Latin America and the Caribbean: +1.8% YoY, +3.9% YTD
Africa: +5.8% YoY, +3.8% YTD
Middle East: +0.8% YoY, +0.7% YTD
Asia and Pacific: +5.1% YoY, +4.9% YTD

World: +3.2% YoY, +4.1% YTD

Worldwide capacity expanded by +3.2% YoY in July 2019. Overall capacity expansion moderated compared to the previous month, except for slight increases in Asia/Pacific, Latin America/Caribbean and the Middle East. **Africa** recorded the fastest capacity expansion, followed by **Asia/Pacific**. The **Middle East** continued to see slow growth.

The YTD capacity expansion was at +4.1%, with **Europe** recording the highest increase.

* Embarked Passengers ** Loaded and Unloaded Freight in Tonnes   1. ICAO estimates   2. Lufthansa Airlines, Eurowings, SWISS, Austrian Airlines, Brussels Airlines, Sun Express, and Lufthansa Cargo   3. British Airways, Aer Lingus, Iberia, and Vueling

ACRONYMS: **ACI:** Airports Council International; **ASK:** Available Seat-Kilometres; **IATA:** International Air Transport Association; **FTK:** Freight Tonne-Kilometres; **LF:** Passenger Load Factor; **OAG:** Official Airline Guide; **RPK:** Revenue Passenger-Kilometres; **UNWTO:** World Tourism Organization; **YoY:** Year-on-year; **YTD:** Year-to-date.