

# Global Air Navigation Services Performance Report 2018

2013 - 2017 Performance Results  
of Air Navigation Service Providers

**Executive Summary**

## Testimonials

### **Airways New Zealand**

The *CANSO Global Air Navigation Services Report* and the associated benchmarking practices are used routinely by Airways New Zealand as part of its regular performance monitoring and collaboration with our customers. Participating in these benchmarking practices demonstrates to customers how Airways New Zealand strives for better operational performance as well as providing peace of mind that Airways New Zealand is focused upon providing cost-effective services.

### **ISAVIA**

Isavia has participated in the *CANSO Global Air Navigation Services Report* since 2013. Our continued involvement with and contribution to the report gives us the opportunity to measure our performance metrics and cost effectiveness on an international basis. This collaboration affords us the opportunity to share and compare information with other ANSPs from around the world, giving us insight into the implementation of effective practices being utilised by other ANSPs. Further, these metrics provide us with valuable information and help us to further improve our service to our customers.

### **Japan Air Navigation Service (JANS)**

In addition to the internal use of the *CANSO Global Air Navigation Services Performance Report*, Japan Air Navigation Service (JANS) holds meetings with Japanese airlines and explains the cost-efficiency and productivity using the report.

This is because JANS has the following accountability to aircraft operators which pay air navigation service charges to receive air traffic services (ATS):

- whether JANS is properly managed according to the cost and;
- whether JANS can provide ATS worth the cost.

Each performance indicator in the report is most useful for us to explain the above, and these indicators are also meaningful data for aircraft operators to compare JANS with other air navigation service providers.

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## Foreword



In 2017, global air navigation services supported safely 42 million commercial flights, helping 4 billion passengers travel worldwide and 62 million tonnes of freight move internationally. In turn, air transport contributed USD 2.7 trillion to global GDP and supported 63 million jobs.

The world's air navigation service providers (ANSPs) are the invisible facilitators of all that activity. Every day they are helping to safely and efficiently manage 120,000 flights transiting the globe on over 45,000 routes, ensuring travellers and cargo get to their destinations.

The performance of ANSPs has an important and direct impact on the aviation value chain; from managing overall capacity to maintaining cost-efficiency. Helping to monitor, manage and transform global air traffic management (ATM) performance and recognise opportunities for improvement are vital, particularly in a market that is constantly growing and an operating environment

that is rapidly developing thanks to new tools and technologies.

The *CANSO Global Air Navigation Services Performance Report* is a CANSO initiative which provides an annual global picture of ATM performance, comparing key cost-efficiency and productivity indicators and highlighting global trends. The report provides ANSPs with a means to measure and benchmark their operations, and drives real dialogue on topics and trends related to performance and improving ATM efficiency in the future.

This ninth edition of the *CANSO Global Air Navigation Services Performance Report*, covering performance data from 2013-2017, illustrates the challenges that face the ATM industry at present, from increased demand for air navigation services to rising service costs. It also demonstrates the truly remarkable job that ANSPs do in powering global aviation, enabling connectivity and delivering significant economic benefits. They are accommodating more activity than ever before, while successfully developing and implementing innovative solutions that are improving ATM performance and upholding the highest levels of safety.

Providing a collaborative platform to help improve global ATM performance will remain a focus of both CANSO and its Members. I would like to thank the CANSO Global Benchmarking Workgroup (GBWG) and all the participating CANSO Members. In addition, I would like to thank Helios for its efforts over the past 5 years in data collection and analysis and its continued dedication in supporting this work.

It is by working together that ATM will meet the challenges inevitable in the years to come.

A handwritten signature in black ink, appearing to read 'Jeff Poole', written over a horizontal line.

Jeff Poole  
Director General CANSO

## 2017 industry trends

### Movement and passenger number growth resilient



### Demand rising faster than supply



Increase in passenger numbers driven predominantly by

### Asia Pacific region



Japan-Korea journeys increased by **26%** and passenger load factor of **81.5%**, record breaking for the third time in four years

## Airline financial performance



2017 provided record profits for airlines worldwide, collective net profit value of

**USD 38 billion**

Global RPK

**8.1%**

Operating margins remained strong at

**7.5%**



Oil prices lower than 2016 at the start of the year but increased by

**20%**

in the second half

**Positive contribution to the wider economy**



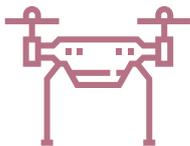
In 2017, air traffic movements contributed

**USD 2.7 trillion**

to global GDP and supported

**63 million** jobs

## Evolving airspace usage



Total European drones in operation for leisure purposes expected

to rise from **1 milion** in 2016

to in excess of **5 milion** by 2020

## Introduction

### Comparing ANSP Performance

Air navigation service providers (ANSPs) are responsible for managing global air traffic safely, efficiently, and cost-effectively. This includes managing and enhancing airspace capacity through improvements to infrastructure and technology, and improving efficiency through a skilled and productive workforce and an innovative and technological approach to airspace management.

The performance of the air navigation system impacts stakeholders across the aviation value chain. From boosting connectivity and minimising delays to upholding the highest standard of safety in aviation, efficient, effective air navigation services are a critical component of a high-performance aviation industry. To that end, CANSO has developed benchmarking tools that aggregate and review global performance accordingly.

Comparing and benchmarking key financial and productivity indicators enables ANSPs to make informed decisions when pursuing increased cost-effectiveness and productivity, without impacting safety – the industry's top priority. It helps ANSPs to work together to address both their own performance and that of the ATM industry worldwide. The *CANSO Global Air Navigation Services Performance Report* does not therefore seek to compare the results of various ANSPs to a 'best-in-class'; rather it highlights global performance trends and identifies performance gaps, acting as a basis for collective improvement.

### Measuring Cost-Efficiency and Productivity

Cost-efficiency and productivity are two key indicators of ANSP performance. They demonstrate how ANSPs are delivering value and serve as indicators of operational efficiency. The *CANSO ANS Performance Framework* (page 15) identifies the factors that determine cost-efficiency and productivity, including employment costs, hours worked and other costs, and is used to create a clear, common model for understanding global ANS performance.

### Global Air Navigation Services Performance Report 2018

The *CANSO Global Air Navigation Services Performance Report 2018* contains performance indicators for identified air navigation service providers (ANSPs) for the year 2017, along with trend data between the 2013 and 2017 fiscal years.

ANSPs also provided contextual comments, including any exceptional events during the year or items that may impact the comparability of their data. Additional comments on important events are included within the contextual data, providing insight into the results of the participating ANSPs.

The detailed results for each ANSP can be found in the [\*Global Air Navigation Services Performance Report 2018: The ANSP View\*](#).

## Related CANSO benchmarking activities

### Safety Performance

CANSO is actively involved with its Member ANSPs to provide a secure platform where safety data can be shared for benchmarking and the overall benefit of aviation safety worldwide. This work is under the responsibility of the CANSO Safety Standing Committee (SSC) and the CANSO Safety Performance Measurement Workgroup (SPMWG), which reports to the SSC.

Approximately 40 ANSPs regularly participate in the sharing of data on IFR-IFR losses of separation, runway incursions and the *EUROCONTROL / CANSO Standard of Excellence in Safety Management Systems Measurement Questionnaire*. Due to the sensitivity of safety information, only participating ANSPs have access to the detailed safety benchmark report. In addition, there are wide variations in the types of reporting systems used to collect this safety data, ranging from manual reports to automatic detection and reporting systems. As a result the data is not consistent across ANSPs.

CANSO and its Members will continue to enhance the safety information included in this *Global Air Navigation Services Performance Report* in future years.

CANSO encourages each of its Members to participate in the CANSO Safety Performance Measurement Workgroup, collaborating for the improvement of global safety performance.

### Human Resources

Human resources is a key determining factor of cost-efficiency and productivity. Alongside the *CANSO Global Air Navigation Services Performance Report*, the *CANSO ATCO Remuneration and HR Metrics Report* provides in-depth analysis of the terms and conditions of employment and other trends and issues, including employment costs.

The 2017 survey indicated that 11 ANSPs had made some provision for pay increases for ATCOs during the period 2018-2020 and one ANSP reported that negotiations are scheduled to commence in 2017. In addition, the report indicated that between 3% and 20% of an air traffic controller's (ATCO) time is spent on non-operational duties.

Some of the key results from the 2017 survey are as follows:

- The average mandatory retirement age for ATCOs is 62 and the median is 60
- Re-call of staff is the most popular method used by ANSPs to cover unplanned absences of ATCOs
- The average length of service is 21+ years
- The average working week of an ATCO is 38 hours
- Annual leave averages a total of 29 days for an ATCO
- 60% of ANSPs provide a shift premium to ATCOs
- 20% of ANSPs do not pay overtime to ATCOs. Where overtime is paid the most common rate is double time
- 11 ANSPs have made some provision for pay increases for ATCOs during the period 2018-2020 and one ANSP reported that negotiations are scheduled to commence in 2017
- 80% of respondents pay students while in training and the average failure rate is 17%

## Key findings

### Increases in the costs of service provision have accompanied increases in traffic<sup>1</sup>

The highest level metric for determining cost-efficiency is cost per IFR flight hour. This is the total cost incurred by an ANSP for safely managing controlled IFR flight hours in continental and oceanic airspace. It is presented on a unit basis (i.e. per IFR hour basis), in order to eradicate the effect of the geographical size of service requirements and the length of flight, thus improving the comparability of the data between different sized ANSPs.

The data shows that around 56% of ANSPs have seen an increase in their continental cost per IFR flight hour, while 44% saw a decrease in 2017. This contrasts to 2016, where the majority (52%) of ANSPs saw a decrease in their continental cost per IFR flight hour.

The cost per IFR flight hour for oceanic ANS, although a much smaller sample size, demonstrates similar trends. A total of 60% of ANSPs providing oceanic services increased the metric, compared to only 25% in 2016.

CANSO Member ANSPs are continuing to adapt to significant increases in traffic, in fact 96% of ANSPs saw an increase in the number of IFR flight hours they controlled. Monitoring the effect of demand pressures on performance is vital to identifying any possible future risks to ATM. This year's data suggests that rises in costs have become necessary to meet rising demands, and that the majority of ANSPs experienced a reduction in cost-efficiency due to the underlying factors within the lower level KPIs (detailed within the report). Unlike many industries where greater volume means lower unit costs, providing additional capacity in ATM can often be more complex and challenging than for the existing capacity, hence higher unit costs for that additional capacity.



<sup>1</sup> For the identified results supporting this key finding, see the results for Cost per IFR hour (Indicator 1) in the ANSP View.

## The pace of increases in employment costs continues to slow<sup>2</sup>

The 'ATCOs in OPS employment cost per ATCO hour' metric considers employment costs per service delivery. A multitude of factors can lead to variances in the absolute value of employment costs in different States and regions, most notably differences in the local or regional economy. It is therefore not beneficial to compare these figures; instead, value can be found in tracking trends in annual growth rates, in addition to observing the values with purchasing power parity (PPP) adjustment.

Similar to the increases noted for the top-level metric (cost per IFR flight hour), the employment costs metric rose for most ANSPs in 2017, as demonstrated by 73% of providers of continental ANS and 67% of providers of oceanic ANS. This roughly matched the proportion of ANSPs increasing this metric from 2015-16. The increase is significantly lower, however, than in 2015, where 89% of ANSPs increased KPI for continental ANS. The magnitude of increases is also noteworthy; whereas 48% of ANSPs saw an increase in the metric of over 5% in 2015, this year only 35% saw such a significant change. Therefore, while employment costs continue to rise – as they have done for several years – the rate of this increase appears to have continued to decelerate.

An increase in employment cost per ATCO in OPS hours suggests either a rise in ATCOs' remuneration or a decrease in working hours. It could also be due to legislative and management changes in some ANSPs, as described in more detail in *The ANSP View*. The continued rises in the metric may allude to a higher average level of experience of ATCOs (who therefore receive larger salaries), or that working hours are being reduced, perhaps due to legal requirements or management choices. Importantly, the slowing rate of growth, meanwhile, may indicate that the industry is approaching more stable cost levels.

↑ **73%**  
increase

↓ **27%**  
decrease

in continental  
employment cost  
per IFR flight hour

↑ **67%**  
increase

↓ **33%**  
decrease

in oceanic employment  
cost per IFR flight hour

<sup>2</sup> For the identified results supporting this key finding, see the results for ATCOs in OPS employment cost per ATCO hour (Indicator 2A) in *The ANSP View*.

## ATCO productivity has increased<sup>3</sup>

The 'ATCOs in OPS hour productivity' metric measures the performance of ATCOs. It is the number of IFR flight hours controlled for every hour that an ATCO is in OPS.

While ATCO employment costs have increased, the data shows that there has been a concurrent rise in ATCO productivity. 71% of ANSPs have seen continental productivity increases over the last year – with approximately 43% of these increases being greater than, or equal to, 4%. This continues the positive trend from 2016, when 76% of ANSPs experienced continental productivity increases.

ATCO productivity is intrinsically linked to IFR hours. It is possible to interpret, therefore, that the majority of participating ANSPs effectively increased ATCO performance in order to meet the rises in IFR hours. In addition, the influence of ATCOs' access to improved technology, which can simplify and thus increase the efficiency of their operations, should be considered in addition to any possible airspace restructuring. The relationship between new technologies and human performance will play an increasingly important role in both the efficiency and effectiveness of ANS in the future.



<sup>3</sup> For the identified results supporting this key finding, see the results for ATCOs in OPS hour productivity (Indicator 2B) in *The ANSP View*.

## Costs excluding ATCO in OPS employment costs also increased for most ANSPs<sup>4</sup>

The 'Costs excluding ATCO in OPS employment costs' metric reflects the contribution that ANS costs, other than those related to ATCO in OPS employment or MET costs, make towards total cost per IFR flight hour. These are referred to as 'other costs', and include operating costs, depreciation or amortization and costs of capital related to providing air traffic control services.

Similarly to ATCO in OPS employment costs, other costs increased in 2016-17 for the majority of ANSPs. In total, 59% of ANSPs saw increases in their other continental ANS costs, while all ANSPs reporting other oceanic ANS costs saw these costs rise.

This trend may, in part, be due to the impact of prolonged traffic growth, leading to ANSPs needing to invest further to provide sufficient capacity. It can therefore help to explain a rise in ANS costs, and a reduction in overall costs efficiency. As mentioned earlier, unlike many industries where greater volume means lower unit costs, providing additional capacity in ATM can often be more complex and challenging than for the existing capacity, hence higher unit costs for that additional capacity.



<sup>4</sup> For the identified results supporting this key finding, see the results for Cost excluding ATCO in OPS employment costs per IFR hour (Indicator 2C) in *The ANSP View*.

## Cost of service delivery has largely increased despite increases in ATCO productivity

Charting the 'Cost per IFR flight hour' against the 'ATCOs in OPS hour productivity' highlights the cost of service delivery compared with the productivity of ATCOs. It helps determine whether changes in ATCO productivity have driven the changes in service delivery costs.

The results demonstrate that, although CANSO ANSP Members have and are continuing to effectively drive improvements in global performance, there are signs that total costs are still rising alongside traffic levels. Most ANSPs increased their productivity for continental ANS, and the majority of ANSPs also saw increases in their cost per IFR flight hour. Nonetheless, there was still a third of ANSPs which both increased their productivity, whilst decreasing their cost per IFR hour for continental ANS. It is also noteworthy that the majority of ANSPs with lower productivity also had higher unit costs.

The most likely explanation is that costs – not necessarily ATCO employment related – were incurred by ANSPs investing in long-term measures to enable continued delivery of ATS to significantly increased traffic. And the contribution of increases in ATCO productivity to cost-efficiency were not able to overcome these. These other costs could be linked to the costs of training new ATCOs employed to help meet the current and future demands of increased traffic, and investment costs to implement new technology and systems to cope with traffic growth.

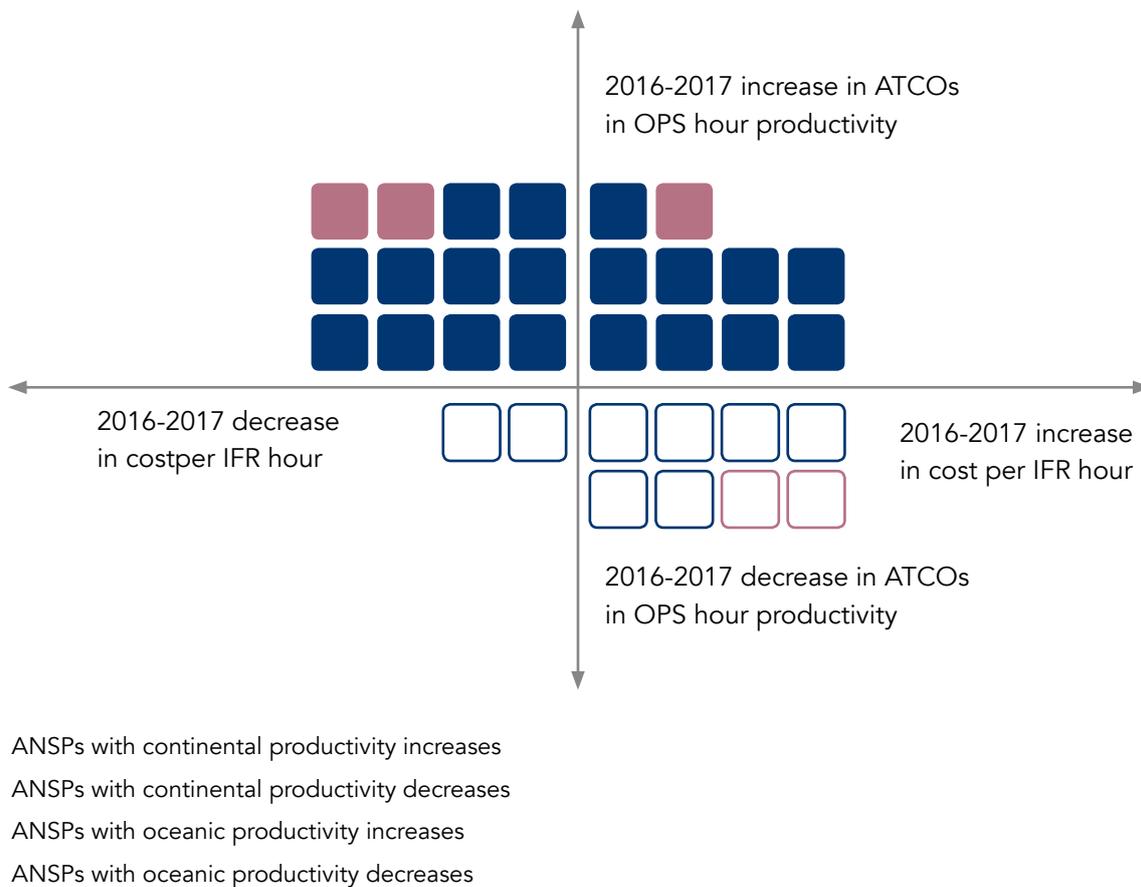


Figure 1: Cost per IFR flight hour vs. IFR flight hours per ATCO in OPS hours

## Summary

### Key findings

- Increases in the costs of service provision have accompanied increases in traffic
- The pace of increases in employment costs continues to slow
- ATCO productivity has increased
- Costs excluding ATCO in OPS employment costs also increased for most ANSPs
- Provision of additional capacity can cost more than the existing capacity due to complexity and other challenges
- Cost of service delivery has largely increased despite increases in ATCO productivity

### Cost-efficiency

From a global perspective, 2017 saw rising traffic and decreasing cost-efficiency. This contrasts with 2016, 2014 and 2013, where traffic increases were accompanied by improvements in cost-efficiency, but is in line with the observations made in this report for 2015, where cost increases outweighed traffic increases.

These reductions in cost-efficiency were in part driven by increases in ATCO employment costs. These costs, however, did not rise as quickly as in 2016. ATCO productivity increased within a similar number of ANSPs as 2016, and yet cost-efficiency changes were less optimistic this year. This indicates that, since 'ATCO in OPS' factors remained relatively constant, 'other costs' could be the driver of change in cost-efficiency in 2017. These other costs are likely to vary from ANSP to ANSP but will include increased costs on frontline service staff employment costs, ATCOs in non-OPS employment costs and capital costs. This conclusion is supported by the increase in costs excluding ATCO in OPS employment costs for most ANSPs.

### Productivity

In line with what was observed for the past two years, ATCO productivity increased for a significant number (71%) of participating ANSPs. It appears that Members benefitted from increases in traffic, which can positively impact ATCO productivity. The challenge of ensuring this is sustainable going forward is becoming increasingly apparent however. ATCO productivity cannot rise indefinitely, but a significant increase in ATCO hiring would also be problematic from an efficiency and productivity standpoint if, and when, there is another downturn in traffic.

Technological and organisational factors may have a part to play in ensuring the sustainability of ATCO productivity improvements. Airspace restructuring and the introduction of new technologies may provide solutions to the challenge of rising traffic in the future.

### Cost-efficiency vs Productivity

Given that cost-efficiency was reduced during 2017 despite consistent 'ATCO in OPS' productivity increases and the decreasing trend in ATCO in OPS employment cost rises, it may be deduced that the key driver of the reduction in cost-efficiency was the accelerated rise in other costs as a result of higher cost capacity being needed to meet the growth in demand.

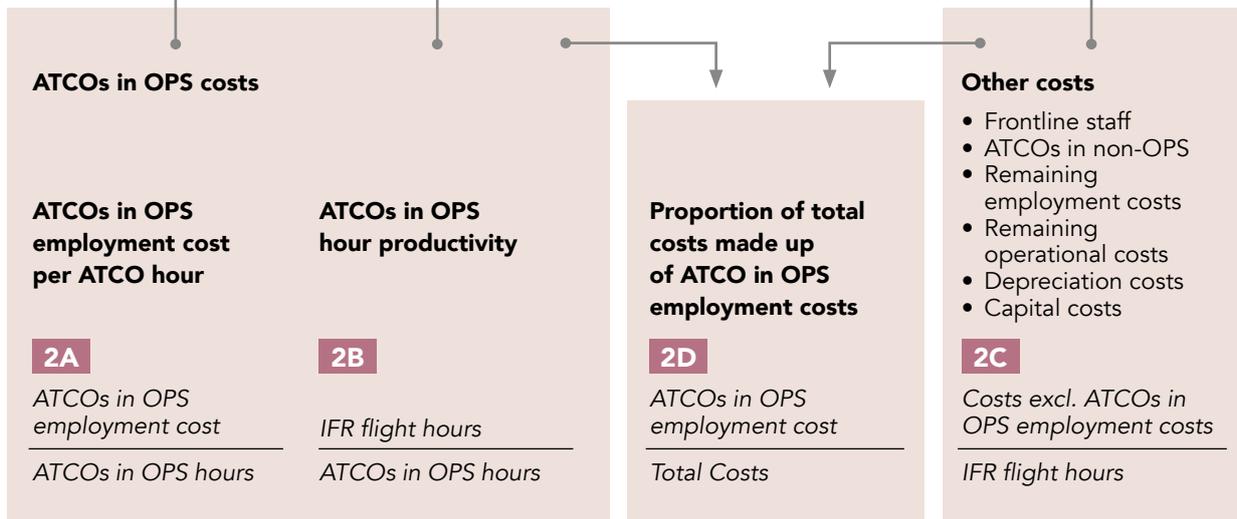
## Key performance indicators

The trends presented within the *Executive Summary* are based on the results of the key performance indicators (KPIs) that comprise the *CANSO ANS Performance Framework*, displayed below. The KPI results for each ANSP are presented in the *ANSP View*.

### Level 1



### Level 2



### Level 3

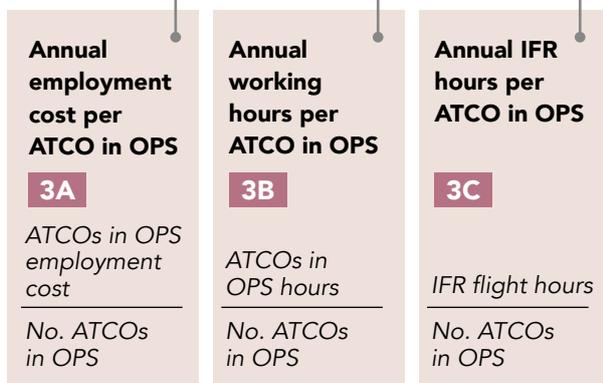


Figure 2: CANSO ANS Performance Framework

## Acronyms and abbreviations

<b>ACI</b>	Airports Council International
<b>ANS</b>	Air navigation services
<b>ANSP</b>	Air navigation service provider
<b>ASK</b>	Available seat kilometres
<b>ATC</b>	Air traffic control
<b>ATCO</b>	Air traffic controller
<b>ATM</b>	Air traffic management
<b>CANSO</b>	Civil Air Navigation Services Organisation
<b>GBWG</b>	Global Benchmarking Workgroup
<b>GDP</b>	Gross domestic product
<b>IATA</b>	International Air Transport Association
<b>IFR</b>	Instrument flight rules
<b>KPI</b>	Key performance indicator
<b>OPS</b>	Operations
<b>PPP</b>	Purchasing power parity
<b>RPK</b>	Revenue passenger kilometres
<b>USD</b>	United States Dollar
<b>VFR</b>	Visual flight rules

## Sources

- [aviationbenefits.org](http://aviationbenefits.org)
- [iata.org/publications/Documents/iata-annual-review-2018.pdf](http://iata.org/publications/Documents/iata-annual-review-2018.pdf)
- [iata.org/pressroom/facts\\_figures/fact\\_sheets/Documents/fact-sheet-industry-facts.pdf](http://iata.org/pressroom/facts_figures/fact_sheets/Documents/fact-sheet-industry-facts.pdf)
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