

GLOBAL AIR NAVIGATION SERVICES PERFORMANCE REPORT

2016 - 2020 ANSP
Performance Results

ACKNOWLEDGEMENTS

This publication is a product of the CANSO Global Benchmarking Workgroup, produced with the assistance of Egis. The workgroup is grateful for the continued analytical support provided by Egis.



We also thank EUROCONTROL and their Performance Review Unit (PRU) for their collaboration in providing the data from their ANSP Cost Effectiveness (ACE) Report. This has enabled our CANSO Air Navigation Services Performance Report to continue to reflect a broader scope of air navigation service providers.



The workgroup would also like to thank its ex-chair, Diána Galgóczi of HungaroControl, for leadership and commitment over the last year.

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FOREWORD

Since early 2020, aviation has been experiencing one of the most difficult periods by any measure or benchmark. The collapse of traffic volumes due to state-imposed travel restrictions aimed at controlling the spread of the COVID-19 pandemic and new virus variants have had devastating effects. The impact has extended far longer than anyone first believed possible at the beginning of the crisis and our attention have begun to shift away from short-term crisis management towards longer-term planning, recovery and building resilience.



At this point of time it is clear that the future 'normal' may not look like how it used to. It is vital to unpick the lessons learnt from the pandemic years and agree on how we baseline our performance going forward. To provide evidence to inform this and build a global picture of how ANSPs were performing before, during and (finally) after the pandemic, we need data – and this is where the work of the CANSO Global Benchmarking Workgroup (GBWG) can help.

This year, CANSO delivers the twelfth edition of the CANSO Global Air Navigation Services Performance Report, which now includes 52 ANSPs from all across the globe. It is the third year in which data has been incorporated from that published by EUROCONTROL's Performance Review Unit (PRU). Inclusion of a wider set of ANSP results enhances the value of the report by presenting an even more global and unique insight into ANS performance. The report is a key output of the work of the GBWG and acts as a tool for ANSPs to compare, contrast and identify good practices and best efforts in ANS performance, particularly in the areas of cost efficiency and ATCO productivity, which were all severely impacted by the decline in traffic.

In this edition, we look back on performance in 2020 at how participating ANSPs were affected by the pandemic and how it reflects in our key performance metrics. In addition, we look at specific feedback from CANSO members on how their businesses have changed and what the pandemic means for resiliency and ANSPs' ability to mitigate the effect of similar challenges in the future.

I would like to thank the CANSO GBWG and all the participating CANSO members. I also thank EUROCONTROL for their support in increasing the scope, scale and utility of our report. In addition, I would like to thank Egis for ten years' of their efforts in data collection and analysis, and their continued dedication in supporting CANSO and the GBWG with this work.

A stylized, handwritten signature in black ink, consisting of a large 'S' and 'H' intertwined.

Simon Hocquard
Director General CANSO

EXECUTIVE SUMMARY

COVERAGE

The *CANSO Global Air Navigation Services (ANS) Performance Report* is produced annually by CANSO's Global Benchmarking Workgroup (GBWG) with the support of Egis. Through agreement with EUROCONTROL's Performance Review Unit (PRU), data regarding European ANSPs taken from the *ATM Cost-Effectiveness (ACE) Benchmarking Report* has been included. ACE Report data collected by the PRU since 2002 is available on the [ACE dashboard](#).

This year's report provides data for 52 ANSPs and contains performance indicators for the year 2020, along with trend data between 2016 and 2020.

In line with CANSO's ambitions for the *Global ANS Performance Report* to reflect a broader picture of performance, data provided by the CANSO Safety Intelligence Workgroup (SIWG) has been included. Collaboration between CANSO workgroups aims to enable interdependencies between data to be analysed and ultimately drive better insights into the reasons behind performance trends.

THE PANDEMIC'S IMPACT ON KEY PERFORMANCE INDICATORS

Any assessment of how the ATM system performed during the pandemic is tied to many factors. The highest priority during crisis must be that the ATM system preserves safety and business continuity during times of uncertainty. On those measures, all indicators are that the system did extremely well. Service interruptions were few and of short duration and were often the result of COVID-19 infection amongst ANSP operational staff. There were some small increases in accident rates per million flights¹ but the fatality risk in 2020 remained unchanged from the 5-year average.

There is also evidence that operational performance metrics affected by congestion improved in line with traffic decline, such as those associated with flight efficiency. This provided limited benefits for those aircraft operators still flying, such as reduced holding, more optimised routing and would have been experienced in reduced excess fuel burn.

While on these measures linked to ANSPs essential services role and the quality of service provided it is clear that the system performed well, it is also clear that other metrics show vulnerabilities to traffic shocks that need to be examined for lessons in future resilience. Financial resilience is a key factor that must be considered, particularly for long duration crisis such as the COVID-19 pandemic. An ability to quickly and easily scale operational costs while ensuring appropriate financial support allows for a flexible response to changing demand in either direction.

With a sudden and severe decline in traffic, it is not surprising that unit cost and productivity metrics were severely impacted. Costs per IFR flight hour is a metric that cumulates ANSPs costs and spreads those out over the total number of annual IFR flight hours the ANSP handles in its airspace. In 2020, the median cost per continental and oceanic IFR flight hour amongst participating ANSPs reached USD 895; representing a year over year increase of 104% (the 2019 median was USD 421). Some ANSPs saw even more significant 200-300% changes in this metric, primarily due to high proportions of international traffic or complete local travel bans, while others, particularly those with strong domestic markets, were less affected.

It is important to note that while cost per IFR flight hour increased significantly, that does not mean that aircraft operators experienced those cost increases through pricing changes. The data show that service charges collected by ANSPs in 2020 covered only 65% of ANSP costs. While in many cases the debt incurred will have to be recouped through future traffic, this provided valuable assistance during a crisis that was having significant financial impacts on air operators.

¹ <https://www.iata.org/en/pressroom/pr/2021-03-25-01/>

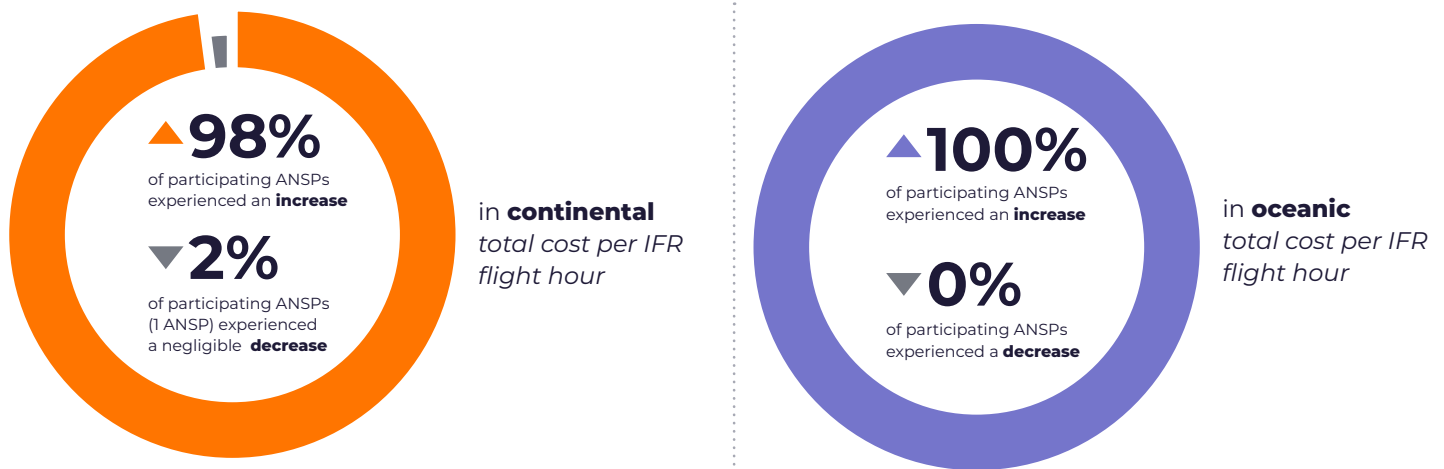
ANSPs did not have had the same opportunity as others in the aviation industry to reduce staffing levels because all airspace needed to remain open and the majority of services needed to continue 24/7. The decline in traffic did result in fewer hours worked with average continental and oceanic ATCO annual working hours dropping by 14% from 1534 to 1319, when comparing the same set of ANSPs.

Not surprisingly, there was also a decline of 28% in continental and oceanic ATCO productivity as measured by IFR flight hours per ATCO in operations. Additionally, average ATCO employment costs did not fall despite a reduction in overtime hours for some ANSPs that accompanied the decrease in traffic.

KEY FINDINGS OF THE REPORT²

Cost Efficiency (Indicator 1)

Cost efficiency severely impacted with a sudden and unprecedented loss of traffic



Average global percentage change – Total cost per IFR flight hour (2019-2020):

CONTINENTAL: +106%

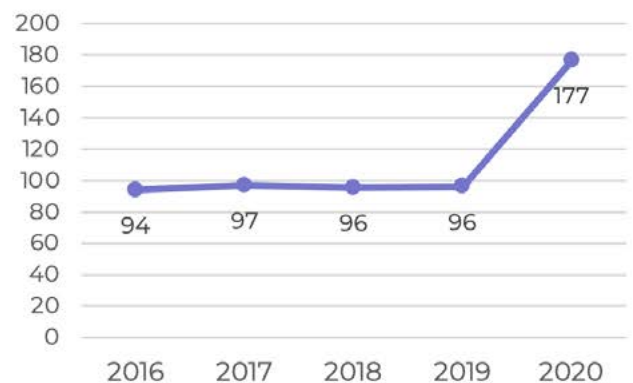
OCEANIC: +84%

Average KPI values – Total cost per IFR flight hour (USD) (2016-2020):

CONTINENTAL:



OCEANIC:

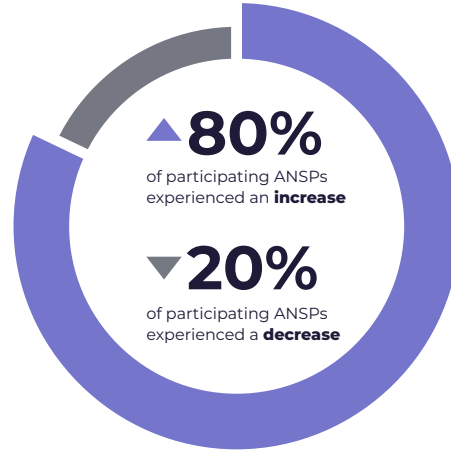


² For identified results supporting these key findings, see 2020 Performance data section. Please note, Airservices Australia and SANS submit data that is used to calculate the global trends within this document's Executive Summary section but their data is not presented in the graphs showing individual ANSP performance in the rest of this document. For this reason, there are also small differences between the numbers presented in both sections.

Accelerated increases in ATCO employment costs per ATCO hour compared to those recorded in the previous years despite a reduction in overtime hours



in **continental**
employment cost
per ATCO hour



in **oceanic**
employment cost
per ATCO hour

Average global percentage change – Employment cost per ATCO hour (2019-2020):

CONTINENTAL: +9%

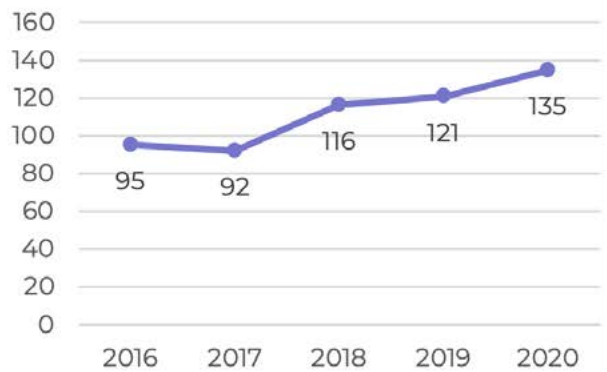
OCEANIC: +11%

Average KPI values – Employment cost per ATCO hour (USD) (2016-2020):

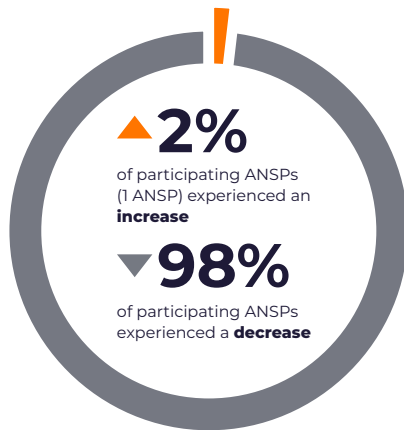
CONTINENTAL:



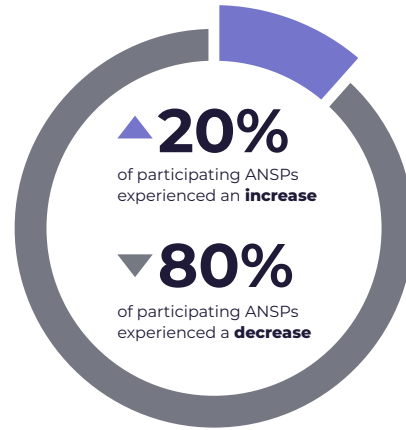
OCEANIC:



ATCO productivity fell with the decline in traffic



in **continental**
ATCO
productivity hour



in **oceanic**
ATCO
productivity hour

Average global percentage change – ATCO productivity (2019-2020):

CONTINENTAL: -43%

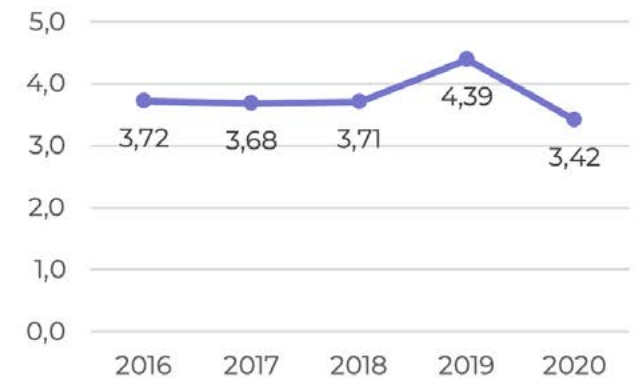
OCEANIC: -22%

Average KPI values – ATCO productivity (2016-2020):

CONTINENTAL:

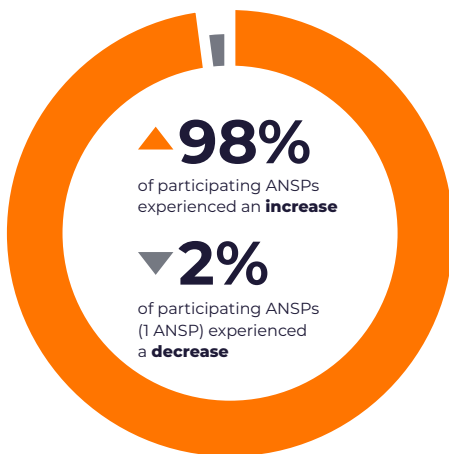


OCEANIC:



Other costs (Indicator 2C)

Similar to the total costs, costs excluding ATCO in OPS employment costs per IFR flight hour impacted with the drop of traffic



in **continental**
other costs per
IFR flight hour



in **oceanic**
other costs per
IFR flight hour

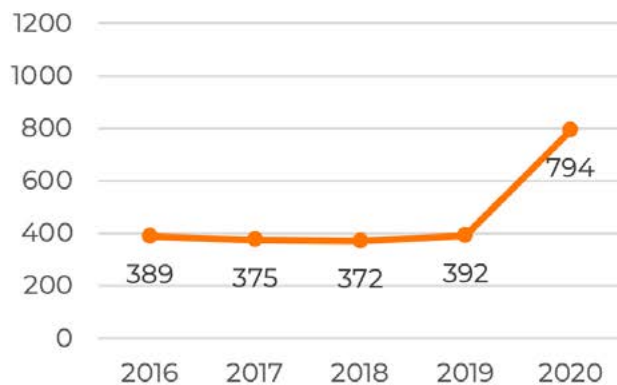
Average global percentage change – Other costs per IFR flight hour (2019-2020):

CONTINENTAL: +103%

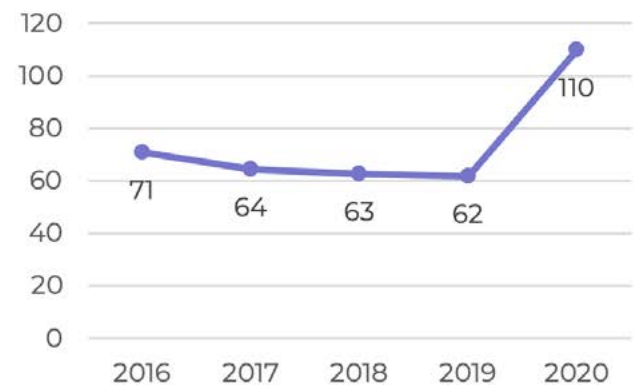
OCEANIC: +78%

Average KPI values – Other costs per IFR flight hour (USD) (2016-2020):

CONTINENTAL:



OCEANIC:



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 approach to airspace management.

The performance of the air navigation system impacts stakeholders throughout the aviation ecosystem. 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 devised benchmarking exercises 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. The understanding gained from benchmarking helps ANSPs to work together to address both their own performance and that of the ATM industry worldwide. The annual CANSO *Global ANS Performance Report* has served to highlight global performance trends for over 12 years.

MEASURING COST EFFICIENCY AND PRODUCTIVITY

Cost efficiency and productivity are two key performance indicators of air navigation services that enable this monitoring of performance. They demonstrate how ANSPs are delivering value and serve as indicators of operational efficiency. The CANSO *ANS Performance Framework* 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

This year's *Global Air Navigation Services Performance Report* contains performance indicators for identified ANSPs for the year 2020, along with trend data between 2016 and 2020.

ANSPs submitting to CANSO have 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 CANSO *Global Benchmarking Workgroup Performance Dashboard*, which is available to participating GBWG members.

INCORPORATION OF PRU DATA

A key objective for CANSO and the members of CANSO's Global Benchmarking Workgroup (GBWG) is to continue to increase the global coverage of the data included in the annual *Performance Report*. To support this, for the third year, CANSO, with the agreement of EUROCONTROL, has incorporated public data collected by EUROCONTROL's Performance Review Unit (PRU) to complete the representation of European ANSPs in the dataset.

It should be noted that while the raw data extracted from the *ACE Report* is directly comparable, the final KPIs expressed in the CANSO report are not directly comparable to those reported in the ACE report.

Primarily, this is because the KPIs use different inputs. In particular, the CANSO report uses IFR flight hours and extracts “*total flight hours controlled by the ANSP*” as a comparable data point from the ACE dataset, while the ACE Report uses “*composite flight hours*”. These comparable data points were validated as part of a comparison exercise undertaken by Egis, which was presented to the GBWG at GBWG/32 in Tokyo.

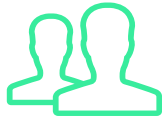
Differences in indicators between the two reports, go beyond the use of a different flight hour measurement. Two key examples are highlighted below:

- CANSO's Performance Report converts all cost data into USD instead of EURO
- CANSO's Performance Report primarily uses Organisation for Economic Co-operation and Development (OECD) as a source for exchange rate, inflation rate and PPP information, whereas EUROCONTROL's ACE Report uses a combination of EUROSTAT and IMF data.

European GBWG members have been allowed to request, with justification, to use the GBWG submission instead. For further details please see *Global Air Navigation Services Performance Report 2016-2020: Participation*.

2020 INDUSTRY TRENDS³

Movement and passenger number growth resilient



Global passenger
decrease of
60.1%
in all regions. Down
from an increase of 3.6%
in 2019



Air cargo tonnage
declined by
15.8%
in 2019. Compared to
a 1.7% decrease in 2019

-33.8% in Aircraft Movements in 2020 (+1.7% in 2019)



International passenger
numbers in **emerging**
markets shrunk

+73%

International passenger
numbers in **advanced**
economies shrunk

+74%

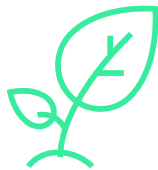


Passenger traffic
at the world's 25 busiest
airports **shrunk by**

53.6%

in 2020, with **36.7%** fewer
aircraft movements

Significant environmental implications as a result of the pandemic



CO2 emissions fell by
33%
compared to 2019 – the
lowest level **since 1997**.



Travel restrictions resulted
in **increased emissions per**
passenger, with an average
load factor of **65%**,
compared to **82% in 2019**.

Greater share of cargo flights
increased average emissions
due to older aircraft used for
these services.



However, older airframes are retired
at a higher rate; **up to 800 older**,
less efficient aircraft expected to not
return to service.

Positive role of aviation in the pandemic with

39,200
repatriation flights,

46,600
special cargo flights,

750,000
tonnes of PPE transported by air.

³ For sources of 2020 Industry Trends data please refer to Annex 8: Sources

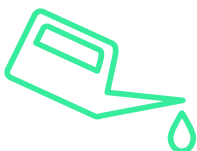
Financial Performance



2020 provided lower profits for airlines worldwide with collective **operating loss** of **\$110 billion**, compared to net profit of \$26 billion in 2019.

Operating margins fell from 5.1% in 2019 to

-29.4 %
in 2020



Significant reduction in jet fuel prices helped offset operating losses; down to just **\$55/bbl. EoY** (\$80/bbl. 2019).

Widespread cost-cutting measures in response to the pandemic



Job layoffs and redundancies to reduce operating costs resulted in

2.3 million job cuts, a staffing decrease of 21% compared to pre-pandemic levels.

In April 2020, **64%** of the global fleet was grounded in response to falling demand.

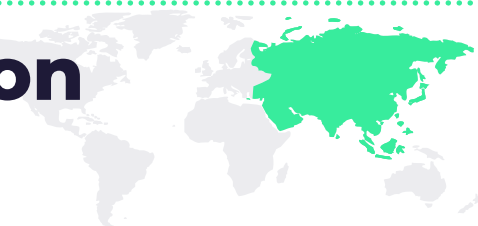
Supply decreases in response to collapse in demand

RPK decreased in-line with ASK, for a load factor of **65.3%** compared to 82.6% in 2019.

RPK ↓ / ASK ↓ = 17.3% decrease in load factor

Asia Pacific region

had the largest decrease in passenger traffic of **80%**, influenced by China's volatility and restrictions to new outbreaks.



Europe accounted for **55%** of world international traffic in 2020, up from 46% in 2019.

Asia/Pacific and North America have experienced **20-25% less decline** in domestic traffic compared to international.

However, China remains busiest region for domestic passengers, with **30%** of world total in 2020.

IMPACT OF COVID-19 ON 2020 PERFORMANCE

PANDEMIC IMPACT ON TRAFFIC

This report focuses on 2020 performance data, however, the reporting periods of members' organisations are not aligned in all instances. The performance data of those ANSPs that have reporting periods running from second half of 2019 or into the first part of 2021 may be differently impacted by the drops and waves in traffic caused by the developing COVID-19 pandemic.

Figure 1 provides a view on the number of COVID-19 cases recorded across the different regions of the globe from early 2020 until mid-2021. The Western Pacific Region was the first region within which there was a significant spike in recorded COVID-19 infections, beginning in late January 2020, and peaking during the w/c 10 February 2020. The rise of recorded infections then began to spread across the globe, starting with Europe noticing a significant spike in March

2020. Recorded cases then began to increase significantly in the Americas, Eastern Mediterranean and South-East Asia during the month of April and May 2020. Africa followed next, with recorded cases building to a peak during late-May and June.

By the last quarter of 2020, a second, even more significant increase of cases hit the world, mainly impacting Europe and Americas. South-East Asia experienced a slightly delayed but even more shocking rise starting in March and April 2021.

Significant seasonality in traffic volumes requires adjustments in capacity. Figure 6 which shows overflight movements in 2018 and 2019 demonstrates how much difference there is between winter and summer for HungaroControl.

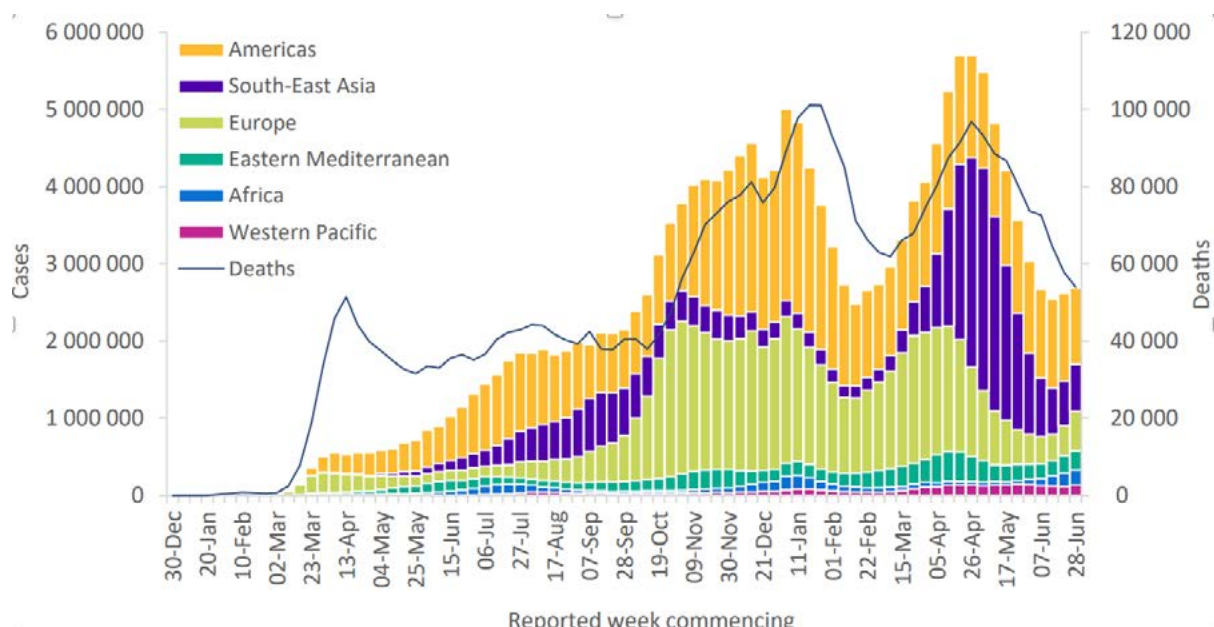


Figure 1 – Number of COVID-19 cases reported weekly by WHO Region, and global deaths, 30 December 2019 to 04 July 2021⁴

⁴ Taken from [WHO COVID-19 weekly update](#), 06 July 2021

To some extent, aircraft movements across 2020 (as shown in Figure 2) follow a similar regional staggered pattern to the distribution of cases (shown in Figure 1). Figure 2 highlights the clear reduction in aircraft movements in Asia in February, several weeks ahead of the marked traffic decreases seen in other regions (NB: the CANSO Asia Pacific region used in Figure 2 contains a subset of the countries included in the WHO's Western Pacific region⁵). During this initial stage of the pandemic, Europe and North America only faced minor traffic decreases, as travel bans were limited to certain routes to and from China during the early stages of the pandemic.

During March 2020, the timeframe within which aircraft movements in the remaining regions dropped was, however, far more truncated than that of the increase in number of COVID-19 cases. This reflects the sudden, and wide reaching, travel restrictions imposed by governments to prevent further infections being introduced to their respective countries through their borders at the start of the pandemic. This drop in movements also reflects the drastic shift of passenger opinion towards an avoidance of air travel to reduce the risk of catching COVID-19⁶.

The pattern in North America and Europe then started to raise back in mid-2020 until the next waves of cases hit the regions. The traffic in Europe bounced back to 60% of 2019 levels by the end of 2020.

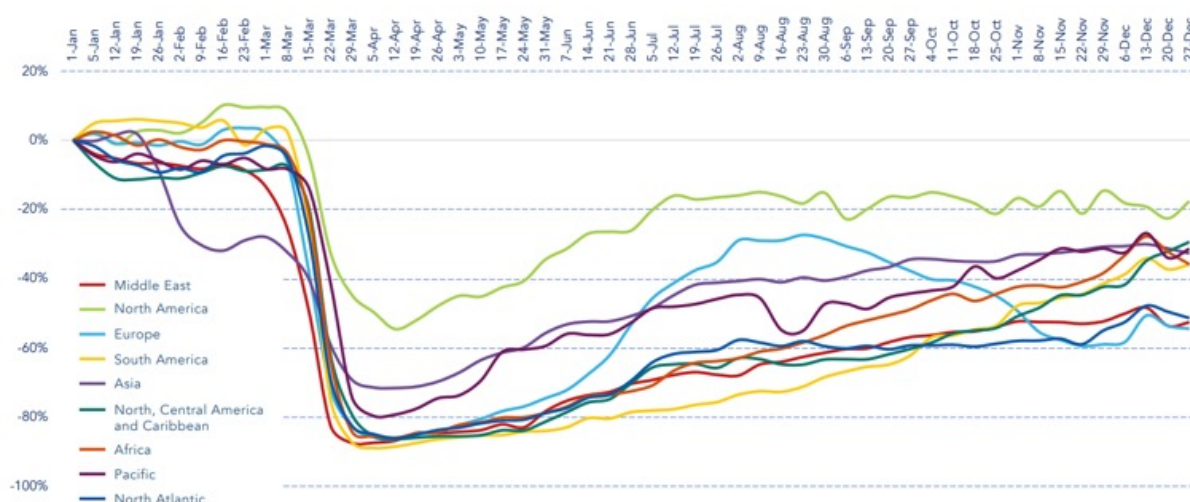


Figure 2 – Percentage change in aircraft movements by region, from Jan 2020 towards Dec 2020. Taken from [CANSO ATM Traffic Analysis Report](#) (January 2021)

IMPACT OF COVID-19 AND VARIED REPORTING PERIODS

There is a clear correlation between the rise in coronavirus cases globally and the unprecedented and sustained drop in traffic seen during the first months of 2020. This notably affected those ANSPs in Asia approximately one month earlier than others across the rest of the world.

Similarly to the last year's report, in collaboration with FAA-ATO we have indicated the reporting periods (fiscal years)

of all ANSPs included in our data. As seen in the following figure, performance data of some ANSPs whose reporting period starts in 2019 were less affected by the impact of the COVID-19 pandemic. Others, especially those ANSPs whose reporting periods stretched into 2021 were more impacted. This must be taken into context when interpreting the trends of those affected ANSPs included in the 2020 Performance data section.

⁵ <https://www.who.int/countries/>

⁶ <https://www.iata.org/en/pressroom/pr/2020-07-07-01/>

Fiscal Years and COVID-19

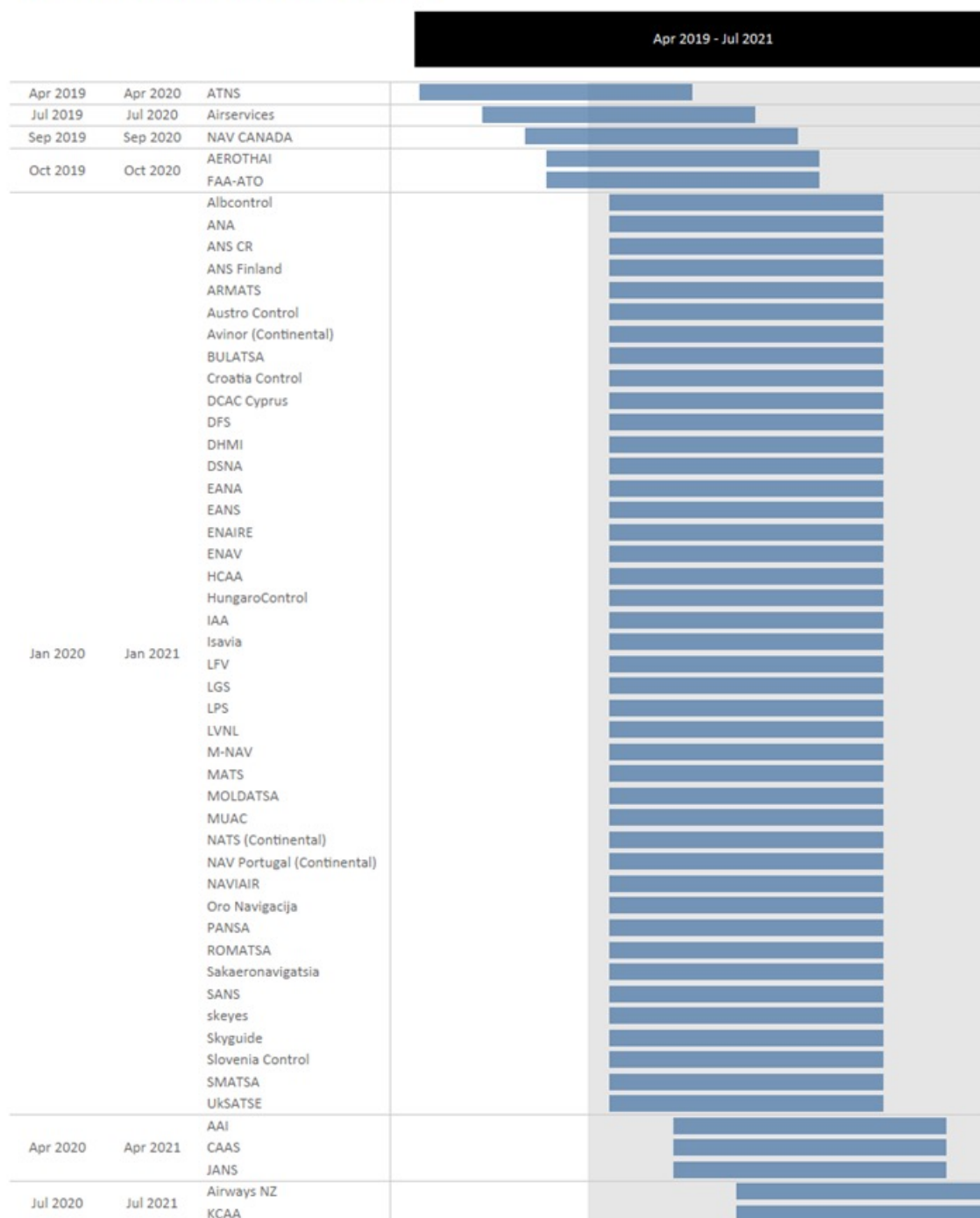


Figure 3 – Reporting periods and COVID-19

In the next figure, the reporting periods are overlaid with information about border closures. It is apparent that every ANSP felt the repercussions of these closures; however, they are not uniformly reflected in the data for many reasons, including (but not limited to) varying fiscal years, the degree to which borders were closed, and domestic airspace size.

Fiscal Years and COVID-19 Border Policies

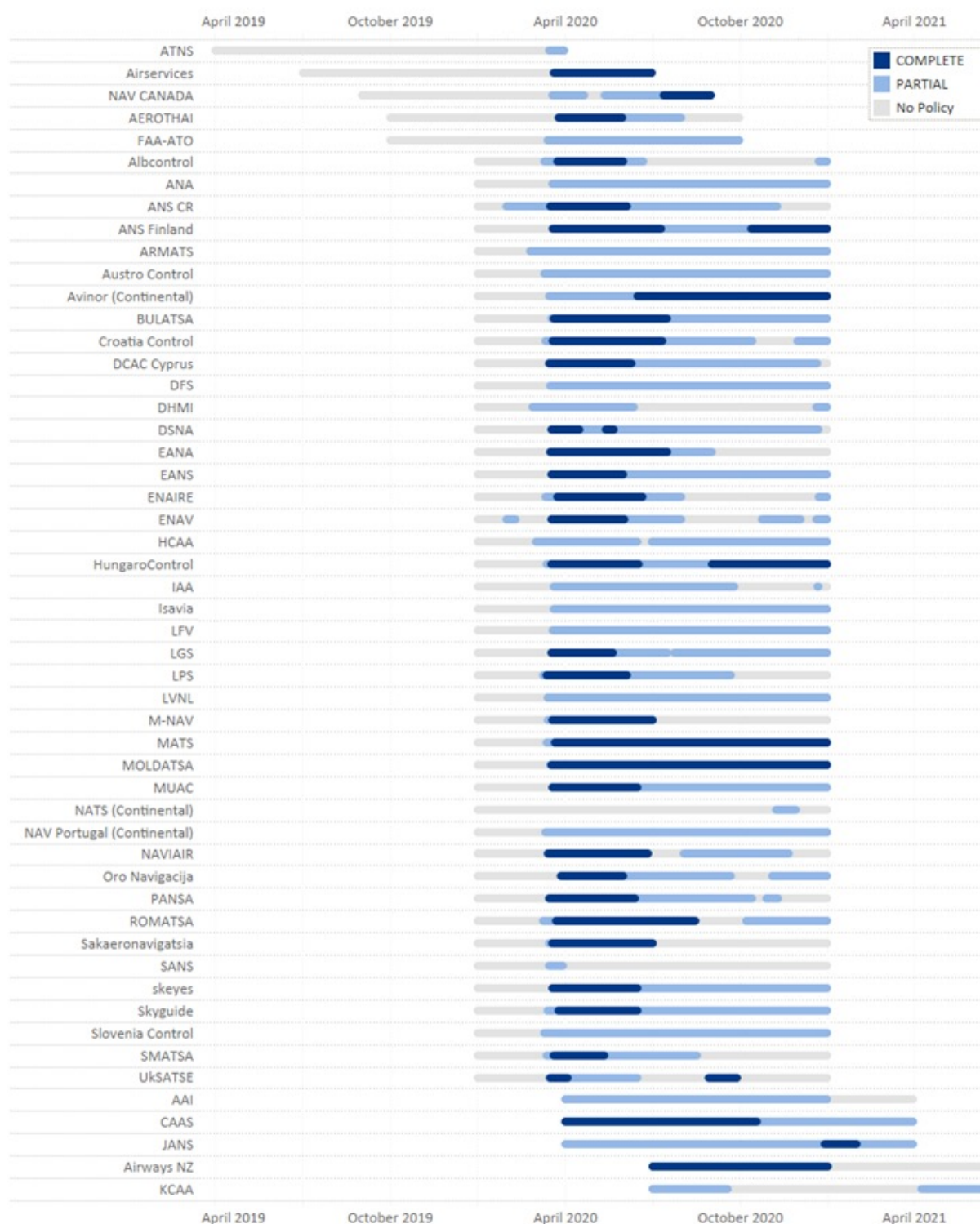


Figure 4 – Reporting periods and COVID-19 border policies

MITIGATING THE FINANCIAL EFFECT OF THE PANDEMIC

As part of the 2020 submission process, a survey on how individual organisations have managed the COVID-19 was included. The overview of responses of ANSPs submitting to CANSO are provided below.



Figure 5 – Mitigating the financial effect of the pandemic

The majority of ANSPs submitting to CANSO took action to adjust their cost base in response to the downturn in traffic and revenue and sought financial support to help fill the revenue gap. Yet it is worth noting that average total costs have only decreased marginally when compared to 2019, despite there being a large variance between ANSPs.

A large majority, 74%, of ANSPs controlled expenditures through the review and postponement of existing CAPEX. While this may serve to reduce planned expenditures quickly in order to ensure continued operation during the pandemic, postponing future projects may delay much-needed capacity enhancements, which may cause difficulties

should traffic rebound quickly to pre-pandemic levels. However, just 4% of ANSPs completely stopped their CAPEX programmes altogether, meaning there is likely awareness of the risks posed by doing so.

While there were operating cost reductions, these were not sufficient to match costs with significantly reduced revenues. Providers have managed to retain ATCOs while deploying them on other, more cost-effective duties, offsetting efficiency losses while keeping operational costs similar. ANSPs highlighted the high level of fixed costs and the challenges around ATCO retention and training (to avoid capacity shortages as traffic recovers) as factors limiting the reduction in operating costs.

Commercial loans were the predominant way for ANSPs submitting to CANSO to receive financial support to close the revenue/cost gap. Several ANSPs noted there was very limited scope for governments to provide capital injections, in part due to the competing financial demands on governments during the pandemic. Some ANSPs were able to access cash reserves or reduce financial pressure by deferring tax payments or other contributions for a period of time.

While increases in service charges have now occurred in many areas, very few occurred during 2020, with only 4% of respondents having adjusted charges. In fact many ANSPs gave service charge deferrals or fee holidays during the pandemic, while others kept charges stable while funding the deficit through commercial loans or state aid.

FUTURE RESILIENCE OF ANSPS

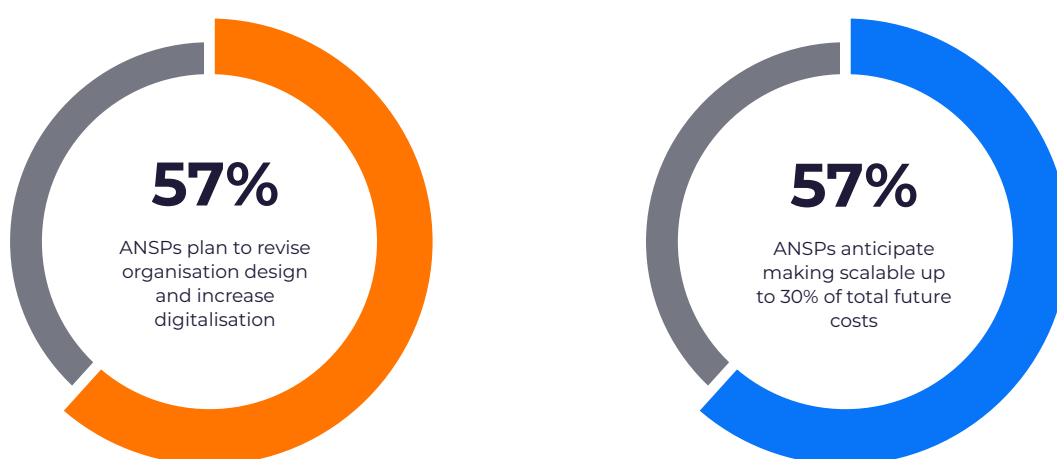


Figure 6 – Future resilience of ANSPs

It is clear that the past two years are causing many in the aviation industry to examine the factors that drive their resilience. A majority of ANSPs have indicated they have active plans to adjust their organisational design, shift priorities and increase digitalisation. An equal majority have indicated that they are seeking to make a portion of their future costs more easily scalable with traffic. Some have indicated their intention to integrate scalability into supplier contracts.

These efforts to examine ways to strengthen the ATM industry's ability to scale with traffic, even if only in part, are worthwhile. Scalability is not symmetrical, and measures that enable ANSPs to scale with traffic growth, will not always provide benefits in the instance of traffic decline.

As ANSPs look to make changes to strengthen future resilience to similar shocks it important to take a balanced view of system performance during this crisis. On certain metrics the system performed well. The impact of measures to enhance scalability on all performance areas should be continually evaluated.

2020 GLOBAL ANS REPORT PARTICIPATION

CANSO GBWG SUBMISSIONS

CANSO data submissions for this year's Global ANS Performance Report were received from 26 ANSPs. Together with the data from PRU, it provides data for 52 ANSPs. All ANSPs who submitted to PRU, CANSO or both are indicated in the table below.

Note that PRU data was used as default in this report for those submitting both CANSO and PRU.

THE 2020 DATA SUBMISSION COVERS 7:						
Total IFR flight hours: 37.6 million						
Total costs: USD 24.1 billion						
Total ATCOs in operations: 39,790						
REGION	COUNTRY/ TERRITORY	ORGANISATION	ACRONYM	SUBMITTED		
				CANSO	PRU	BOTH
Africa	Kenya	Kenya Civil Aviation Authority	KCAA	x		
	South Africa	Air Traffic & Navigation Services	ATNS	x		
Americas	Argentina	Empresa Argentina de Navegación Aérea	EANA	x		
	Canada	NAV CANADA	NAV CANADA	x		
	USA	Federal Aviation Administration – Air Traffic Organization	FAA-ATO	x		
Asia Pacific	Australia	Airservices Australia ⁸	Airservices	x		
	India	Airports Authority of India	AAI	x		
	Japan	Japan Air Navigation Service	JANS	x		
	New Zealand	Airways New Zealand	Airways NZ	x		
	Singapore	Civil Aviation Authority of Singapore	CAAS	x		
	Thailand	Aeronautical Radio of Thailand	AEROTHAI	x		

⁷ As some ANSPs did not submit data for every field, this is not the total for all participating ANSPs; rather it is the total of all data submitted.

⁸ Airservices Australia submitted data that is used to calculate the global trends within this document's Executive Summary section but their data is not presented in the graphs included in the rest of this document.

REGION	COUNTRY/ TERRITORY	ORGANISATION	ACRONYM	SUBMITTED		
				CANSO	PRU	BOTH
Europe	Albania	Air Navigation Services of Albania	Albcontrol		x	
	Armenia	Armenia Air Traffic Services	ARMATS		x	
	Austria	Austro Control	Austro Control		x	
	Belgium	skeyes	skeyes		x	
	Bulgaria	Bulgarian Air Traffic Services Authority	BULATSA		x	
	Croatia	Croatia Control Ltd	Croatia Control		x	
	Cyprus	Department of Civil Aviation of Cyprus	DCAC Cyprus		x	
	Czech Republic	Air Navigation Services of the Czech Republic	ANS CR		x	
	Denmark	Navigation Via Air	NAVIAIR		x	
	Estonia	Estonian Air Navigation Services	EANS			x
	Finland	Fintraffic Air Navigation Services	ANS Finland		x	
	France	Direction des Services de la navigation aérienne	DSNA			x
	Georgia	Sakaeronavigatsia Ltd.	Sakaeronavigatsia		x	
	Germany	DFS Aviation Services GmbH	DFS		x	
	Greece	Hellenic Civil Aviation Authority	HCAA		x	
	Hungary	HungaroControl Pte. Ltd. Co.	HungaroControl			x
	Iceland	Isavia Air Navigation Services	Isavia ANS	x		
	Ireland	Irish Aviation Authority	IAA		x	
	Italy	ENAV S.p.A ⁹	ENAV		x	
	Latvia	Latvijas gaisa satiksme	LGS			x
	Lithuania	SE Oro Navigacija	Oro Navigacija			x
	Luxembourg	Administration de la navigation aérienne	ANA	x		

⁹ ENAV has provided its view that KPIs that compare data referred to different dimensions (for example Costs, ATCOs in OPS hours, Number of ATCOs in OPS referred to Gate to Gate and Flight hours referred only to En-route) are not representative of real phenomena. Moreover, ENAV's costs are oriented towards the achievement of the cost efficiency target defined in accordance with the EU Regulation (DUC).

REGION	COUNTRY/ TERRITORY	ORGANISATION	ACRONYM	SUBMITTED		
				CANSO	PRU	BOTH
Europe	Macedonia	Macedonian Air Navigation Service Provider, GOJSC	M-NAV			x
	Malta	Malta Air Traffic Services	MATS		x	
	Moldova	Moldovian Air Traffic Services Authority	MOLDATSA		x	
	Netherlands	Luchtverkeersleiding Nederland	LVNL		x	
	Norway	Avinor Air Navigation Services	Avinor (Continental)		x	
	Poland	Polish Air Navigation Services Agency	PANSA			x
	Portugal	Navegação Aérea de Portugal – NAV Portugal, E.P.E.	NAV Portugal (Continental)			x
	Romania	Romanian Air Traffic Services Administration	ROMATSA		x	
	Serbia and Montenegro	Serbia and Montenegro Air Traffic Services SMATSA Ilc	SMATSA			x
	Slovakia	Letové prevádzkové služby	LPS		x	
	Slovenia	Kontrola zračnega prometa Slovenije	Slovenia Control			x
	Spain	ENAI	ENAI			x
	Sweden	Luftfartsverket	LFV		x	
	Switzerland	skyguide	skyguide		x	
	Turkey	General Directorate of State Airports Authority	DHMI			x
	Ukraine	Ukrainian State Air Traffic Service Enterprise	UKSATSE		x	
	United Kingdom	NATS Holdings	NATS (Continental)		x	
	-	Maastricht Upper Areal Control Centre	MUAC		x	
Middle East	Saudi Arabia	Saudi Air Navigation Services ¹⁰	SANS	x		

Table 1 – CANSO Global ANS Report participation

¹⁰ SANS submitted data that is used to calculate the global trends within this document's Executive Summary section but their data is not presented in the graphs included in the rest of this document.

REPORTING PERIODS

While the GBWG encourages ANSPs with reporting periods that do not run between January and December to submit their most recent dataset, it is noted this is not possible for some providers due to data validation and availability. Readers are therefore encouraged to check reporting periods when comparing individual ANSPs. These are outlined in the table below.

REGION	ORGANISATION	REPORTING PERIOD
Africa	KCAA	Jul 2020 – Jun 2021
	ATNS	Apr 2019 – Mar 2020
Americas	EANA	Jan 2020 – Dec 2020
	NAV CANADA	Sep 2019 – Aug 2020
	FAA-ATO	Oct 2019 – Sep 2020
Asia Pacific	Airservices	Jul 2019 – Jun 2020
	AAI	Apr 2020 – Mar 2021
	JANS	Apr 2020 – Mar 2021
	Airways NZ	Jul 2020 – Jun 2021
	CAAS	Apr 2020 – Mar 2021
	AEROTHAI	Oct 2019 – Sep 2020
Europe	Albcontrol	Jan 2020 – Dec 2020
	ARMATS	Jan 2020 – Dec 2020
	Austro Control	Jan 2020 – Dec 2020
	skeyes	Jan 2020 – Dec 2020
	BULATSA	Jan 2020 – Dec 2020
	Croatia Control	Jan 2020 – Dec 2020
	DCAC Cyprus	Jan 2020 – Dec 2020
	ANS CR	Jan 2020 – Dec 2020
	NAVIAIR	Jan 2020 – Dec 2020
	EANS	Jan 2020 – Dec 2020
	ANS Finland	Jan 2020 – Dec 2020
	DSNA	Jan 2020 – Dec 2020
	Sakaeronavigatsia	Jan 2020 – Dec 2020

REGION	ORGANISATION	REPORTING PERIOD
Europe	DFS	Jan 2020 – Dec 2020
	HCAA	Jan 2020 – Dec 2020
	HungaroControl	Jan 2020 – Dec 2020
	Isavia ANS	Jan 2020 – Dec 2020
	IAA	Jan 2020 – Dec 2020
	ENAV	Jan 2020 – Dec 2020
	LGS	Jan 2020 – Dec 2020
	Oro Navigacija	Jan 2020 – Dec 2020
	ANA	Jan 2020 – Dec 2020
	M-NAV	Jan 2020 – Dec 2020
	MATS	Jan 2020 – Dec 2020
	MOLDATSA	Jan 2020 – Dec 2020
	LVNL	Jan 2020 – Dec 2020
	Avinor (Continental)	Jan 2020 – Dec 2020
	PANSA	Jan 2020 – Dec 2020
	NAV Portugal (Continental)	Jan 2020 – Dec 2020
	ROMATSA	Jan 2020 – Dec 2020
	SMATSA	Jan 2020 – Dec 2020
	LPS	Jan 2020 – Dec 2020
	Slovenia Control	Jan 2020 – Dec 2020
	ENAIRE	Jan 2020 – Dec 2020
	LFV	Jan 2020 – Dec 2020
	skyguide	Jan 2020 – Dec 2020
	DHMI	Jan 2020 – Dec 2020
	UKSATSE	Jan 2020 – Dec 2020
	NATS (Continental)	Jan 2020 – Dec 2020
	MUAC	Jan 2020 – Dec 2020
Middle East	SANS	Jan 2020 – Dec 2020

Table 2 – Participating ANSPs' reporting periods

TOTAL IFR FLIGHT HOURS

ORGANISATION	TOTAL IFR FLIGHT HOURS 2020 (CONTINENTAL)	GROWTH IFR FLIGHT HOURS (CONTINENTAL)	TOTAL IFR FLIGHT HOURS 2020 (OCEANIC)	GROWTH IFR FLIGHT HOURS (OCEANIC)
AAI	1,724,177	-53%		
AEROTHAI	473,965	-45%		
Airways NZ	187,520	-11%	31,874	-68%
Albcontrol	21,929	-54%		
ANA	10,353	-64%		
ANS CR	113,261	-59%		
ANS Finland	57,321	-55%		
ARMATS	5,268	-70%		
ATNS	262,986	-3%	13,831	148%
Austro Control	155,355	-55%		
Avinor (Continental)	226,600	-38%		
BULATSA	127,863	-57%		
CAAS	103,123	-78%		
Croatia Control	106,693	-60%		
DCAC Cyprus	78,614	-60%		
DFS	700,899	-55%		
DHMI	665,542	-55%		
DSNA	1,051,941	-58%		
EANA	137,273	-68%		
EANS	33,558	-56%		
ENAIRE	664,154	-59%		
ENAV	494,359	-59%		
FAA-ATO	19,009,964	-25%	1,482,367	-33%
HCAA	276,276	-55%		
HungaroControl	124,317	-56%		
IAA	131,294	-59%		
Isavia ANS	13,235	-53%	118,353	-57%
JANS	1,295,186	-47%		

ORGANISATION	TOTAL IFR FLIGHT HOURS 2020 (CONTINENTAL)	GROWTH IFR FLIGHT HOURS (CONTINENTAL)	TOTAL IFR FLIGHT HOURS 2020 (OCEANIC)	GROWTH IFR FLIGHT HOURS (OCEANIC)
KCAA	87,166	-22%		
LFV	198,629	-56%		
LGS	39,170	-57%		
LPS	41,055	-63%		
LVNL	81,921	-53%		
MATS	40,016	-55%		
M-NAV	16,484	-56%		
MOLDATSA	5,091	-60%		
MUAC	289,992	-57%		
NATS (Continental)	609,959	-61%		
NAV CANADA	2,228,244	-30%	456,028	-30%
NAV Portugal (Continental)	175,009	-60%		
NAVIAIR	98,936	-57%		
Oro Navigacija	36,493	-48%		
PANSA	221,029	-57%		
ROMATSA	171,847	-57%		
Sakaeronavigatsia	26,349	-47%		
skeyes	55,762	-52%		
Skyguide	150,242	-59%		
Slovenia Control	28,029	-56%		
SMATSA	105,288	-63%		
UKSATSE	86,231	-56%		

Table 3 – Participating ANSPs' IFR flight hours

2020 PERFORMANCE DATA

The following section presents 2020 performance data and 2016-2020 trend data for both continental and oceanic activities in line with the *CANSO ANS Performance Framework* levels 1-3 (see Figure 35) and list of Key Performance Indicators below.

KPI		NUMERATOR	DENOMINATOR	FIGURE REFERENCES	
COST EFFICIENCY AND PRODUCTIVITY PERFORMANCE INDICATORS				CONTINENTAL	OCEANIC
				2020 / TREND	2020
1	Cost per IFR flight hour	Total costs	IFR flight hours	Figure 7	Figure 18
2A	ATCO in OPS employment cost per ATCO in OPS hour	Employment costs for ATCOs in OPS	ATCOs in OPS hours	Figure 8, 9	Figure 19, 20
2B	ATCO in OPS hour productivity	IFR flight hours	ATCOs in OPS hours	Figure 10	Figure 21
2C	Cost excluding ATCOs in OPS employment costs per IFR flight hours	Costs excluding employment costs for ATCOs in OPS	IFR flight hours	Figure 11	Figure 22
2D	Employment costs of ATCOs in OPS as a proportion of Total costs	Employment costs for ATCOs in OPS	Total costs	Figure 12	Figure 23
3A	Annual employment cost per ATCO in OPS	Employment cost for ATCOs in OPS	No. of ATCOs in OPS (FTE)	Figure 13, 14	Figure 24, 25
3B	Annual Working hours per ATCO in OPS	ATCOs in OPS hours	No. of ATCOs in OPS (FTE)	Figure 15	Figure 26
3C	Annual IFR hours per ATCO in OPS	IFR flight hours	No. of ATCOs in OPS (FTE)	Figure 16	Figure 27
3D	Ratio of frontline service staff to ATCO in OPS	No. of frontline service support staff (FTE)	No. of ATCOs in OPS (FTE)	Figure 17	Figure 28
JOINT CONTINENTAL AND OCEANIC COST EFFICIENCY PERFORMANCE INDICATORS				CONTINENTAL AND OCEANIC	
				2020/TREND	
CO1	Cost per IFR flight hour	Total costs	IFR flight hours	Figure 29	
CO2D	Employment costs of ATCOs in OPS as a proportion of Total costs	Employment costs for ATCOs in OPS	Total costs	Figure 30	

Table 4 – List of Key Performance Indicators

Note that KPI CO1 is the combined continental and oceanic metric for KPI 1. Likewise, KPI CO2D is the combined continental and oceanic metric for KPI 2D.

CONTINENTAL COST EFFICIENCY AND PRODUCTIVITY: 2020

Indicator 1: Cost per IFR hour (USD) (Formula: Total costs / IFR flight hours)

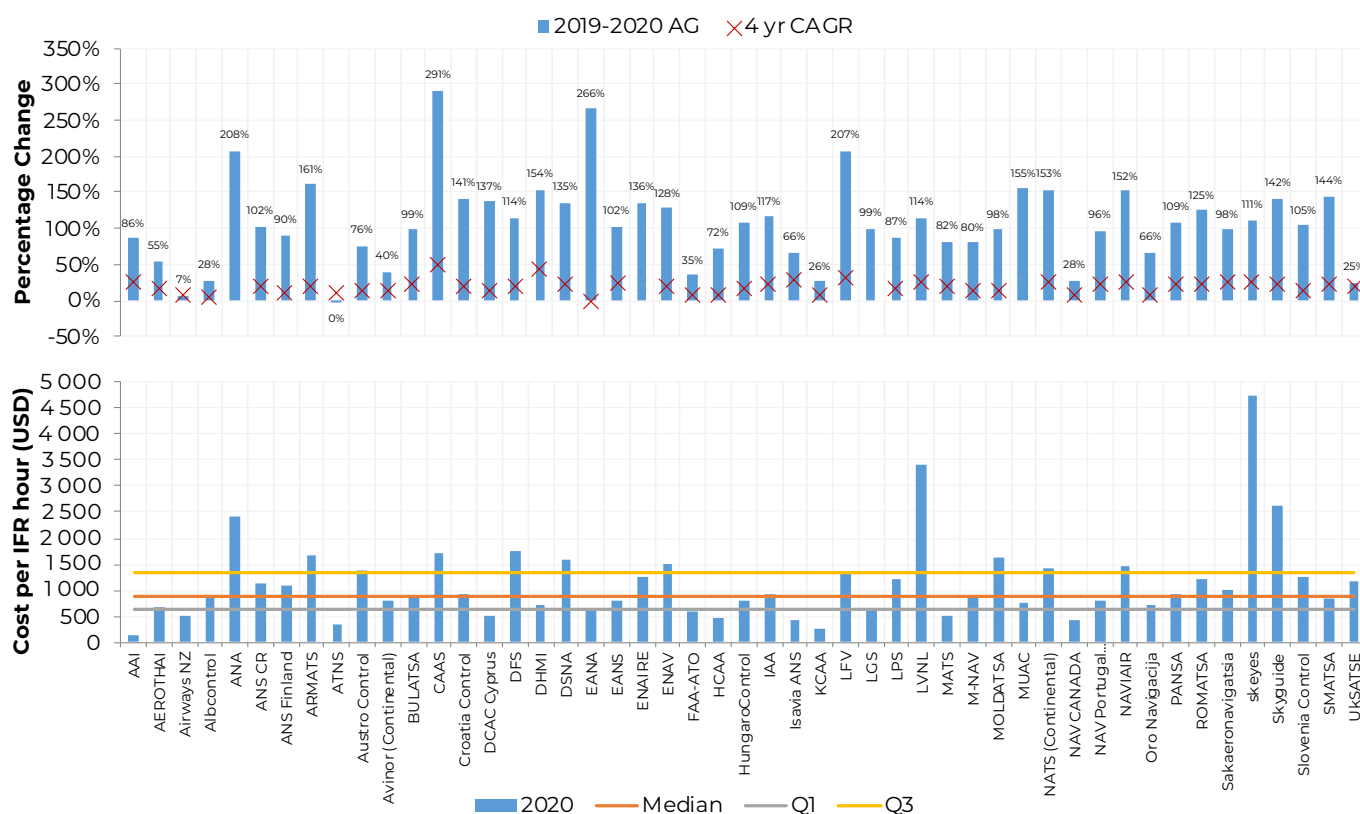


Figure 7 – Cost per IFR flight hour (USD)

The 2020 median cost per IFR flight hour is USD 896, heavily impacted by the loss of traffic due to the COVID-19 pandemic. The 2020 weighted average (taking into account total continental IFR flight hours per ANSP) cost per IFR flight hour is USD 700. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was USD 444 and weighted average was USD 442.

In terms of absolute total costs, 78% of ANSPs saw reduction of total continental costs with median reduction of 10% between 2019 and 2020.

It should be noted that differences between the operational characteristics of ANSPs' airspaces may significantly influence their 'Cost per IFR flight hour'. For example, skyes and LVNL have delegated control of their upper airspace to MUAC. skyes and LVNL therefore have a higher 'Cost per IFR flight hour', than if they would also control the upper airspace, because the traffic is generally more complex in lower airspace. MUAC, meanwhile, make use of infrastructure provided by skyes and LVNL, which reduces its 'Cost per IFR flight hour'. Furthermore, since the upper airspace does not include VFR flights, MUAC's ATCO in OPS productivity is fully reflected in this KPI, while the values for skyes and LVNL does include VFR workload, which reduces the ATCO in OPS productivity.

Specific ANSP comments are outlined below.

UkSATSE (Ukraine)

The following justification is taken from the ACE Report 2020.

In the case of UkSATSE, the main driver of cost reductions were reduced staff costs (-41.8%) due to the implementation of short-time work, natural attrition and job displacements. The second largest contributors were exceptional items (-86.5%) due to the reporting of a very large amount of bad debts in 2019.

Austro Control (Austria)

The following justification is taken from the [ACE Report 2020](#).

For Austro Control, staff costs (-32.0%) were the main driver. It is understood that this results from the combination of a large decrease in pension contributions, public funding of short-time work, decrease in overtime payments and the waiver of termination benefits, leading to a decrease in future termination liabilities.

ENAV (Italy)

The following justification is taken from the [ACE Report 2020](#).

For ENAV, all cost categories decreased in 2020, with the main contributors being ATCO employment costs (-11.0% mainly due to a reduction in the variable component of the remuneration), the cost of capital (-16.8% following the decision to cap the cost of capital charged to airspace users in respect of the year 2020) and non-staff operating costs (-2.7%).

DFS (Germany)

The following justification is taken from the [ACE Report 2020](#).

For DFS, the increase in non-staff operating costs (+19.5%) was outweighed by reductions in staff costs, depreciation costs and the cost of capital. The latter is the most significant reduction (-60.8%). It reflects a decision to apply a 0% return on equity and to charge only the cost of debt for the year 2020.

HCAA (Greece)

The following justification is taken from the [ACE Report 2020](#).

For HCAA, there was decrease in staff costs (-22.6% mainly due to the reduction of the variable component of remuneration which is linked to the level of traffic), non-staff operating costs (-18.8%) and depreciation costs (-54.7%).

LFV (Sweden)

The following justification is taken from the [ACE Report 2020](#).

For LFV, there was an exceptionally high increase in staff costs (+53.9%) due to an actuarial revaluation of pension liabilities following the decrease in the discount rate. Overall, the impact of the increase in staff costs was reduced by the decreases in all other cost categories.

MUAC (-)

The following justification is taken from the [ACE Report 2020](#).

In the case of MUAC, staff costs are also the only cost category increasing in 2020 (+13.0%) while small reductions were achieved in other cost categories. The increase in staff costs is mainly due to a combination of two factors: a +5.2% increase in the number of staff, primarily reflecting additional ab-initio trainees and the application of the general condition of employment for ATCOs in OPS which were revised in 2019.

NAVAIR (Denmark)

The following justification is taken from the [ACE Report 2020](#).

For NAVIAIR, there were higher staff costs (+10.2%) reflecting the creation of a provision for voluntary redundancies. The full effect expected from this measure in terms of staff cost reductions will materialise in 2022 since most of staff departures started only in the last quarter of 2021. Increases in depreciation costs (+10.0%) and cost of capital (+22.9%) are also observed mainly due to upgrades to the ATM system and the application of a higher weighted average cost of capital.

Indicator 2A: ATCOs in OPS employment cost per ATCO in OPS hour (USD) (Formula: ATCOs in OPS employment costs / ATCOs in OPS hours)

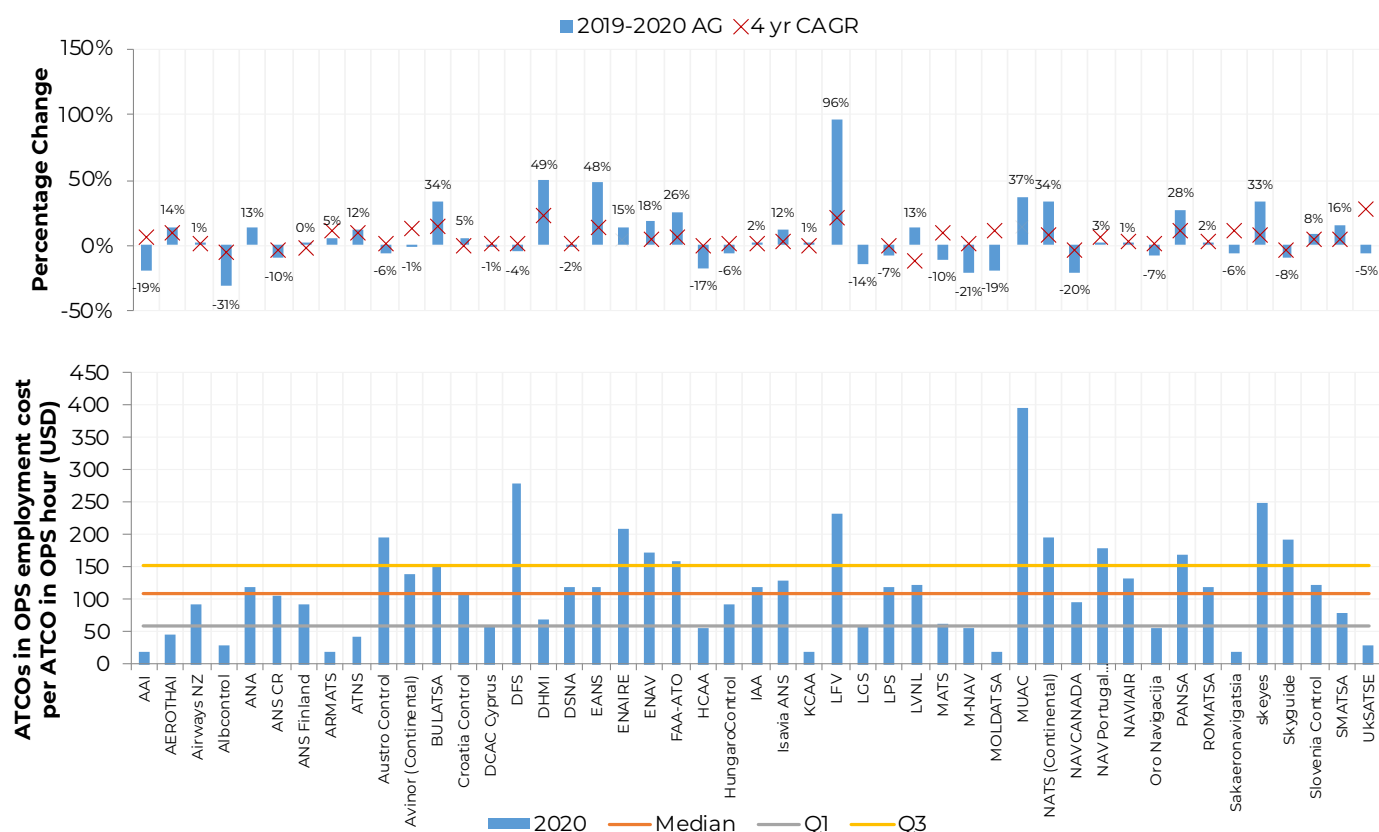


Figure 8 – ATCOs in OPS employment cost per ATCOs in OPS hour (USD)

The 2020 median ATCOs in OPS employment cost per ATCOs in OPS hour is USD 111. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was USD 105.

Specific ANSP comments are outlined below.

LFV (Sweden)

The following justification is taken from the [ACE Report 2020](#).

The exceptionally high increase between 2019 and 2020 in case of LFV is affected by an actuarial revaluation of pension liabilities following the decrease in the discount rate.

MUAC (-)

The following justification is taken from the [ACE Report 2020](#).

The increase in ATCO in OPS employment costs is mainly due to the application of the general condition of employment for ATCOs in OPS which were revised in 2019.

UKSATSE (Ukraine)

The following justification is taken from the [ACE Report 2020](#).

In the case of UKSATSE, the metric is impacted by the decrease of number of ATCOs in OPS, which reflect situations where the application of short-time work resulted in a downward adjustment of the number of ATCOs when expressed in full time equivalents.

Skyguide (Switzerland)

The following justification is taken from the [ACE Report 2020](#).

In the case of Skyguide, the metric is impacted by the decrease of number of ATCOs in OPS, which reflect situations where the application of short-time work resulted in a downward adjustment of the number of ATCOs when expressed in full time equivalents. It is important to take into account the fact that the 2020 staff costs could be lowered thanks to the application of a short-time work mechanism which enabled Skyguide to be reimbursed for a fraction of employees' salaries by the employment insurance.

Austro Control (Austria)

The following justification is taken from the [ACE Report 2020](#).

For Austro Control, the observed decrease mainly reflects lower pension contributions but also a reduction in gross wages and salaries due to the decrease in overtime payment and the public funding of short-time work.

Avinor (Norway)

The following justification is taken from the [ACE Report 2020](#).

For Avinor, the decrease is mainly due to the furlough scheme implemented, reduction of overtime hours as well as temporary and permanent redundancies. During the temporary redundancy period the employees are compensated by the State.

ENAV (Italy)

The following justification is taken from the [ACE Report 2020](#).

For ENAV, there were reductions in variable salary components (including overtime) and some containment measures on salary increases. There was also a decrease in ATCO in OPS employment costs reflecting lower variable remuneration (less overtime and lower performance bonuses) and the use of backlog holidays. In addition, the lower remuneration resulted in a consequent reduction in social security contributions.

ENAI (Spain)

The following justification is taken from the [ACE Report 2020](#).

For ENAI, there were reductions in variable salary components (including overtime) and some containment measures on salary increases. There was also an increase in the number of ATCOs in "active reserve", which is an intermediate step between the withdrawal of functions in OPS and the retirement of ATCOs.

Indicator 2A: ATCOs in OPS employment cost per ATCO in OPS hour (USD) – PPP adjusted

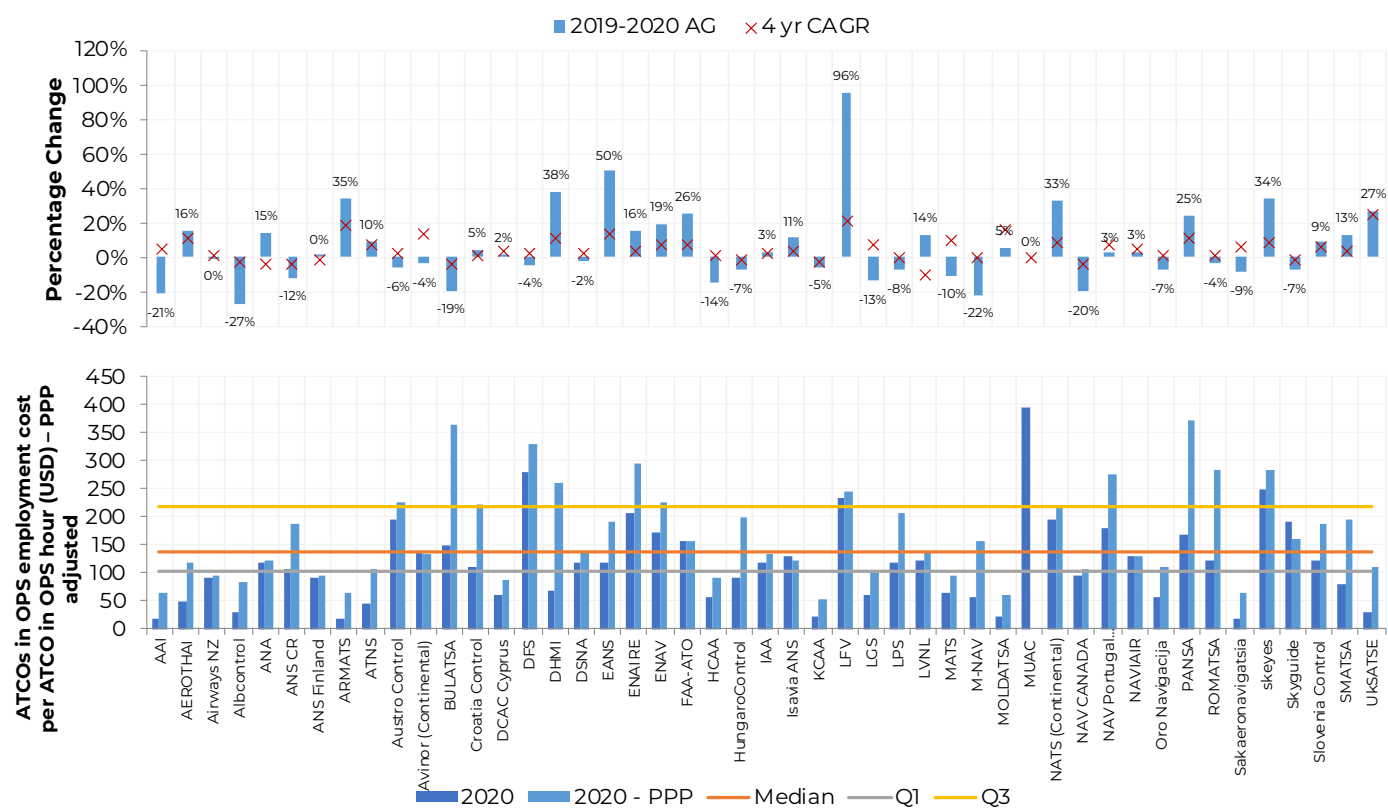


Figure 9 – ATCOs in OPS employment cost per ATCOs in OPS hour, PPP adjusted (USD)

The 2020 median ATCOs in OPS employment cost per ATCOs in OPS hour, after PPP adjustment is USD 139. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was USD 129.

Indicator 2B: ATCOs in OPS hour productivity (Formula: IFR flight hours / ATCOs in OPS hours)

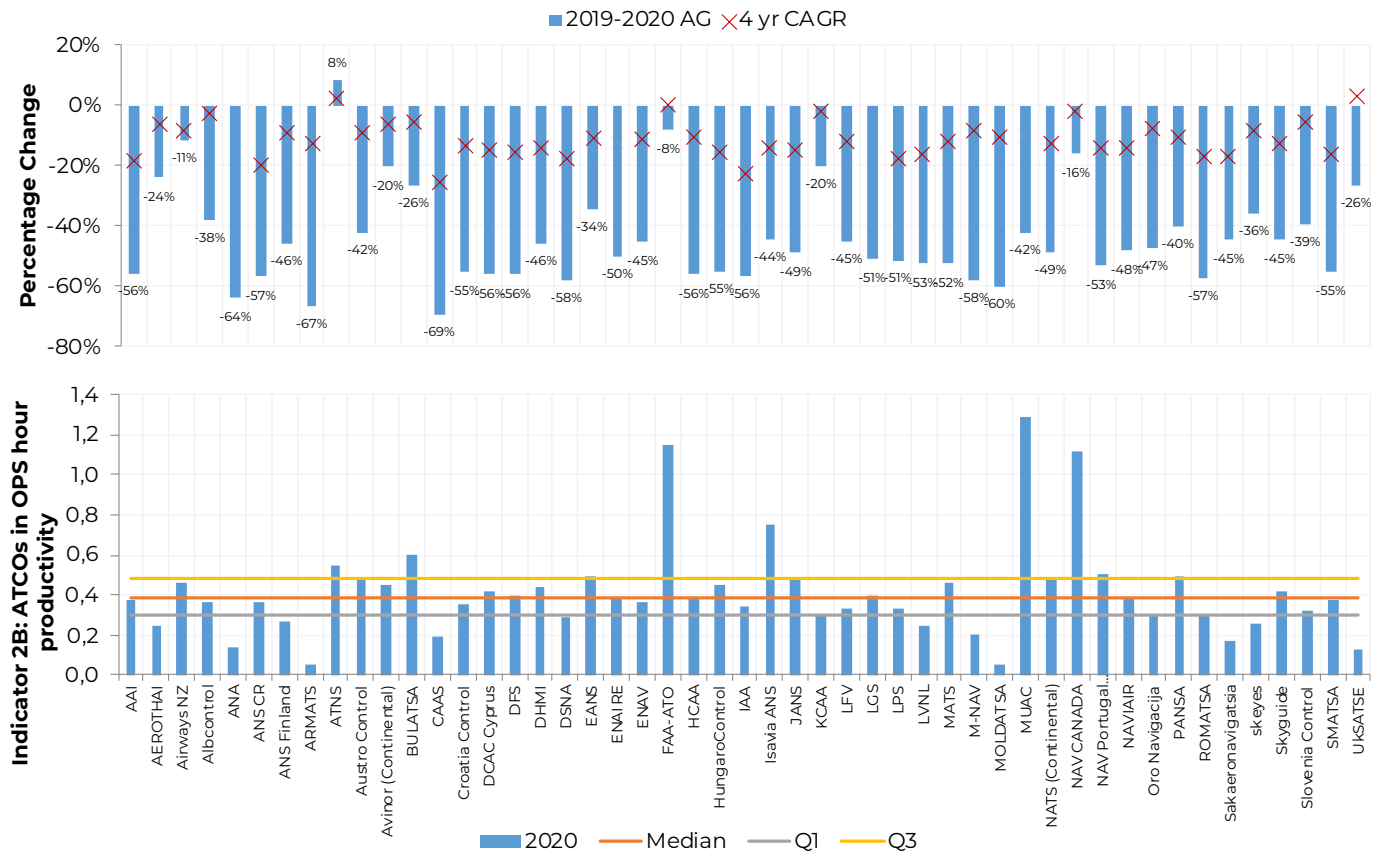


Figure 10 – ATCOs in OPS hour productivity

2020 median ATCOs in OPS hour productivity is 0.38. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was 0.76.

Specific ANSP comments are outlined below.

FAA-ATO (USA)

FAA-ATO Productivity was not as impacted as other ANSPs because FAA-ATO did not have as large of a percent reduction in IFR flight hours. The FAA-ATO controls one of the largest areas of airspace globally and still had cargo traffic even while passenger traffic was down. In addition, ATCO in OPS hours also decreased in 2020 due in part to the staffing measures taken to reduce potential COVID-19 exposure risk and the decrease in overtime hours.

Indicator 2C: Costs excluding ATCOs in OPS employment costs per IFR hour (USD) (Formula: Costs excluding ATCOs in OPS employment costs / IFR flight hours)

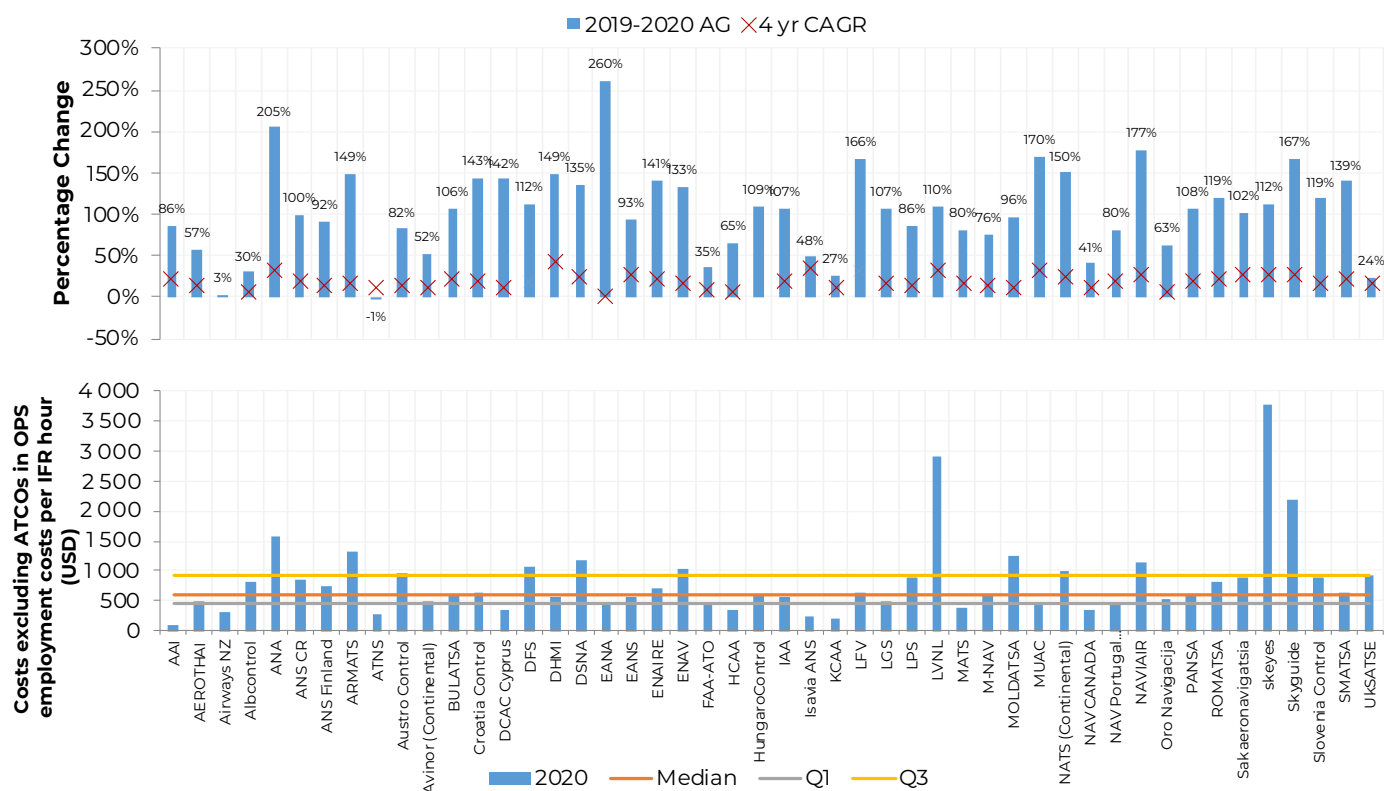


Figure 11 – Cost excluding ATCOs in OPS employment costs per IFR flight hour (USD)

The 2020 median cost excluding ATCOs in operations employment cost per IFR flight hour is USD 609. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was USD 311.

In terms of absolute total costs, 80% of ANSPs saw reduction of continental costs excluding ATCOs in OPS employment costs with median reduction of 8% between 2019 and 2020.

For the same reasons stated in the description of Indicator 1 'Cost per IFR flight hour', it should be noted that differences between the operational characteristics of ANSPs' airspaces may significantly influence their 'Costs excluding ATCOs in OPS employment costs per IFR hour'.

Specific ANSP comments are outlined below.

UKSATSE (Ukraine)

The following justification is taken from the [ACE Report 2020](#).

In the case of UKSATSE, there were reductions in staff costs (-40.1% due to the implementation of short-time work) and exceptional costs (-86.5% due to very high provisions for bad debt in 2019).

HCAA (Greece)

The following justification is taken from the [ACE Report 2020](#).

For HCAA, the metric is impacted by the fall in support staff costs (-26.9% mainly due to the reduction of the variable component of remuneration which is linked to the level of traffic), non-staff operating costs (-18.8%) and depreciation costs (-54.7%).

NAV Portugal (Portugal)

The following justification is taken from the [ACE Report 2020](#).

For NAV Portugal, metric is impacted by the lower support staff costs (-37.5%), which results from the combination of exceptional actuarial gains on staff pensions and a reduction in wages and overtime hours for the support staff.

LPS (Slovakia)

The following justification is taken from the [ACE Report 2020](#).

LPS reduced support staff costs (-43.3% mainly due to reductions in salaries and benefits) and non-staff operating costs (-24.5% by limiting the non-essential expenditures).

Albcontrol (Albania)

The following justification is taken from the [ACE Report 2020](#).

For Albcontrol, support staff costs fell by -44.0% due to salary reductions and application of a furlough scheme. Non-staff operating costs decreased by -44.9%. The drop in depreciation costs (-38.0%) and cost of capital (-12.4%) resulted from the revaluation of Albcontrol's assets and the extension of the asset-life for some of them.

Indicator 2D: Proportion of total costs made up of ATCO in OPS employment costs (USD) (Formula: ATCO in OPS employment costs/Total Costs)

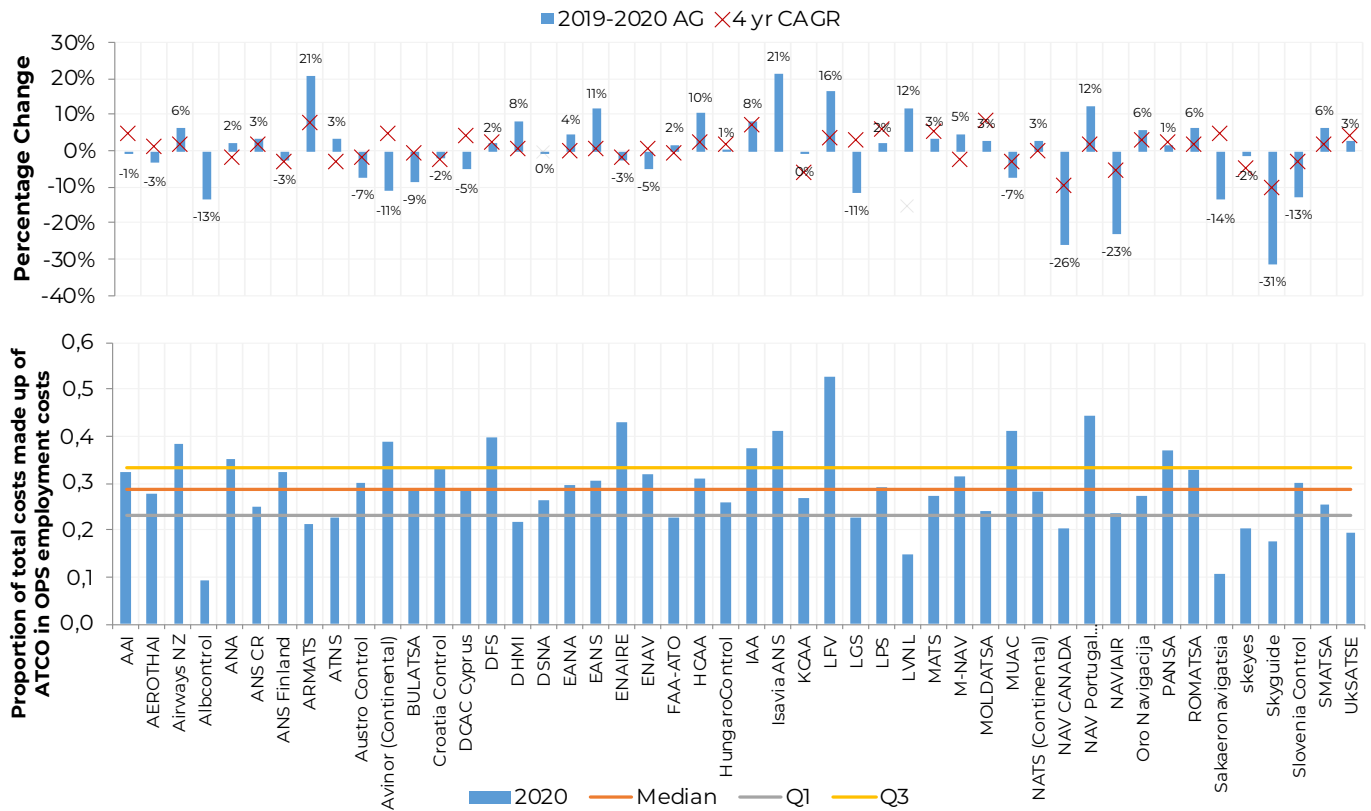


Figure 12 – Proportion of total costs made up of ATCO in OPS employment costs

In 2020, on median 29% of total ANS costs were spent on employing ATCO in OPS. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was 28%.

Indicator 3A: Annual employment cost per ATCO in OPS (USD) (Formula: ATCOs in OPS employment costs / No. ATCOs in OPS)

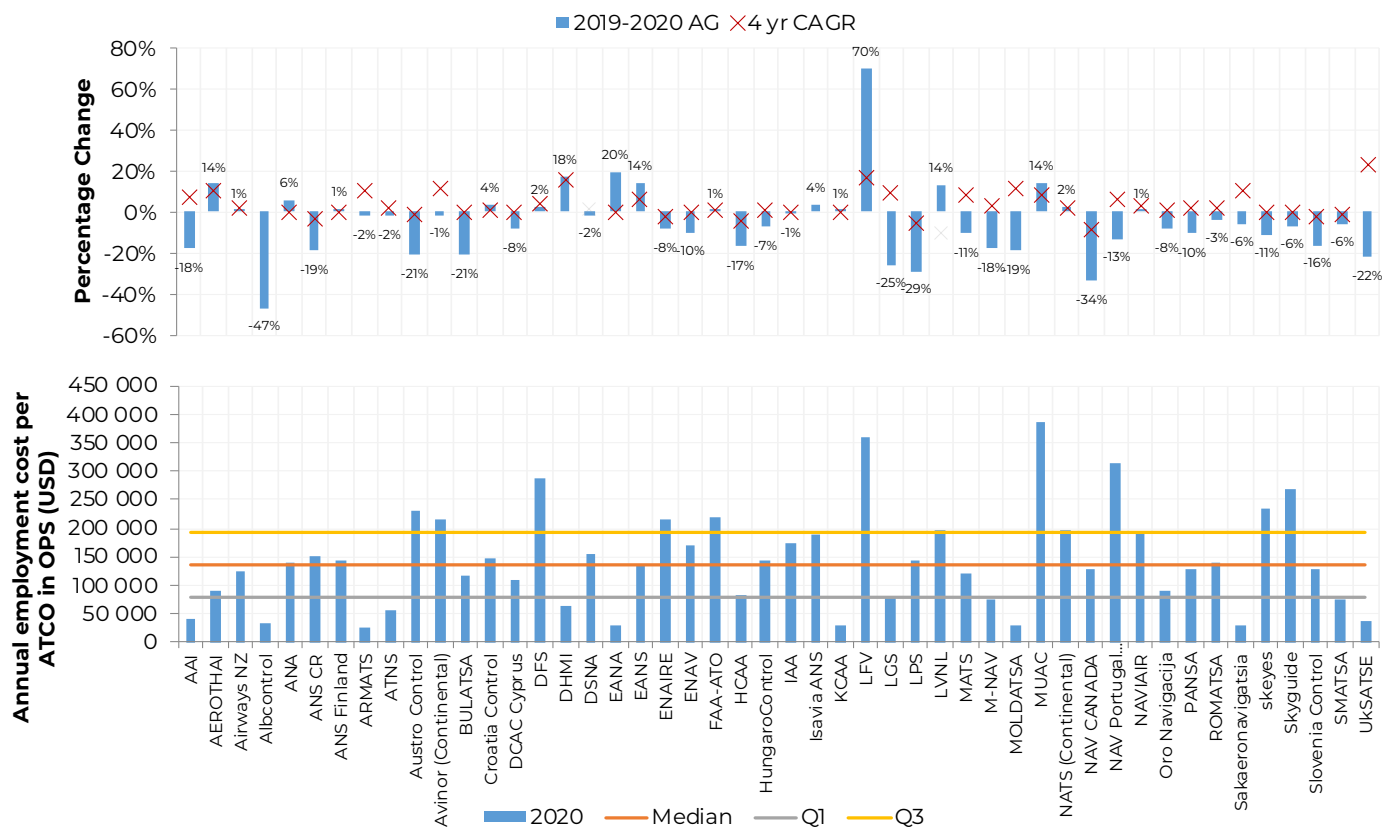


Figure 13 – Annual ATCO in OPS employment cost (USD)

The 2020 median unit ATCO in OPS employment cost is USD 137,282. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was USD 143,457.

Specific ANSP comments are outlined below.

AEROTHAI (Thailand)

AEROTHAI calculated FTE using total actual working hours divided by full-time equivalent working hours which is 160 hours per month for ATCO. This method of calculation is different from what we used to do and report to CANSO, therefore the KPI in this report is incomparable to KPI presented in the previous reports. Moreover, AEROTHAI will be adjusting FTE calculation for the next submission for 2022 report, according to the new definition of FTE.

LFV (Sweden)

The following justification is taken from the [ACE Report 2020](#).

The exceptionally high increase between 2019 and 2020 in the case of LFV is affected by an actuarial revaluation of pension liabilities following the decrease in the discount rate.

MUAC (-)

The following justification is taken from the [ACE Report 2020](#).

The increase in ATCO in OPS employment costs is mainly due to the application of the general condition of employment for ATCOs in OPS which were revised in 2019.

UKSATSE (Ukraine)

The following justification is taken from the [ACE Report 2020](#).

In the case of UKSATSE, there was the decrease of number of ATCOs in OPS, which reflect situations where the application of short-time work resulted in a downward adjustment of the number of ATCOs when expressed in full time equivalents.

Skyguide (Switzerland)

The following justification is taken from the [ACE Report 2020](#).

In the case of Skyguide, there was decrease in the number of ATCOs in OPS, which reflects situations where the application of short-time work resulted in a downward adjustment of the number of ATCOs when expressed in full time equivalents.

It is important to take into account the fact that the 2020 staff costs could be lowered thanks to the application of a short-time work mechanism which enabled Skyguide to be reimbursed for a fraction of employees' salaries by the employment insurance.

Austro Control (Austria)

The following justification is taken from the [ACE Report 2020](#).

For Austro Control, the observed decrease mainly reflects lower pension contributions but also a reduction in gross wages and salaries due to the decrease in overtime payment and the public funding of short-time work.

Avinor (Norway)

The following justification is taken from the [ACE Report 2020](#).

For Avinor, the decrease is mainly due to the furlough scheme implemented, reduction of overtime hours as well as temporary and permanent redundancies. During the temporary redundancy period the employees are compensated by the State.

ENAV (Italy)

The following justification is taken from the [ACE Report 2020](#).

For ENAV, there were reductions in variable salary components (including overtime) and some containment measures on salary increases. There was also a decrease in ATCO in OPS employment costs reflecting lower variable remuneration (less overtime and lower performance bonuses) and the use of backlog holidays. In addition, the lower remuneration resulted in a consequent reduction in social security contributions.

ENAIRE (Spain)

The following justification is taken from the [ACE Report 2020](#).

For ENAIRE, there were reductions in variable salary components (including overtime) and some containment measures on salary increases. There was also an increase in the number of ATCOs in "active reserve", which is an intermediate step between the withdrawal of functions in OPS and the retirement of ATCOs.

Indicator 3A: Annual employment cost per ATCO in OPS (USD) – PPP adjusted

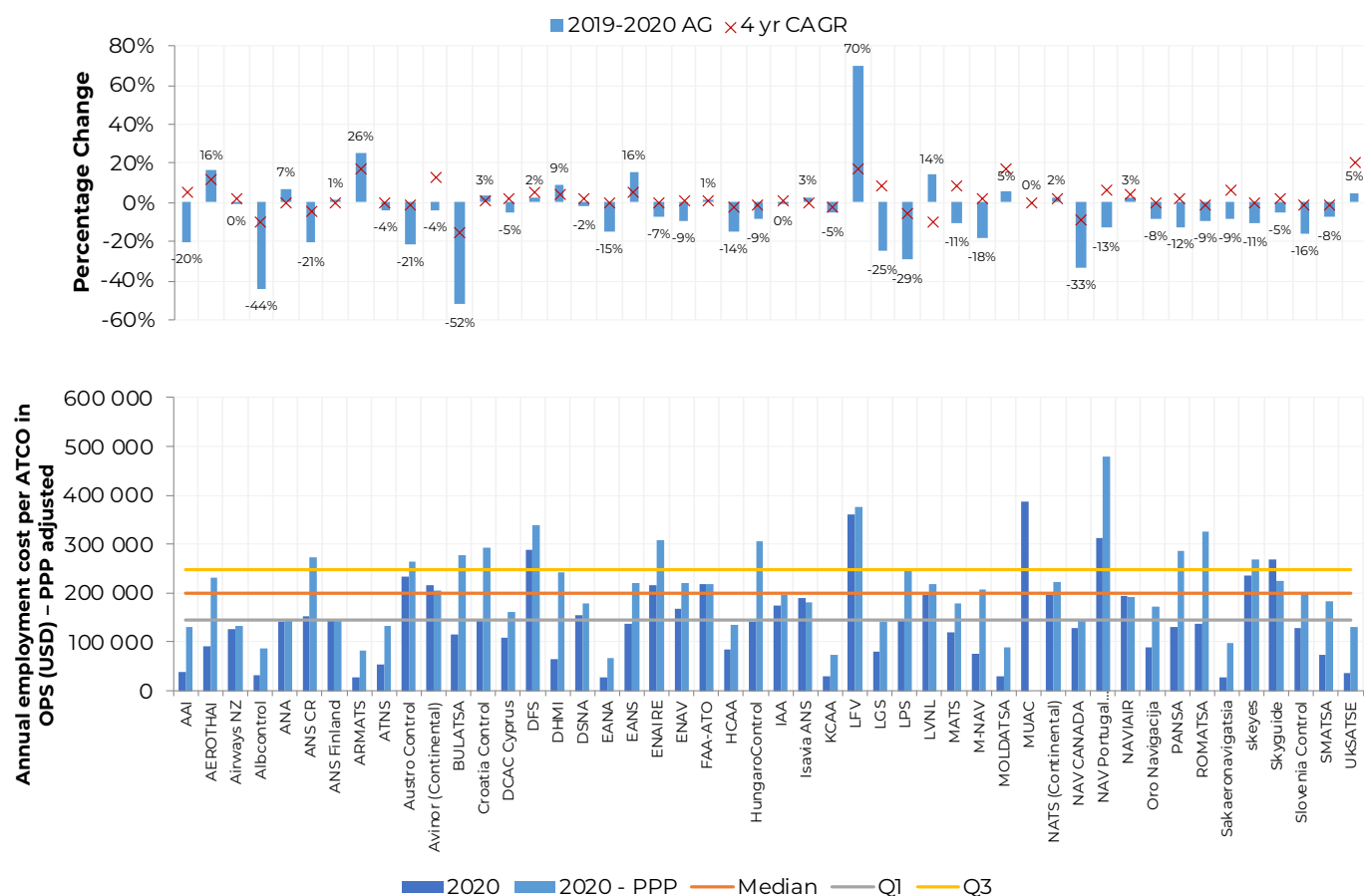


Figure 14 – Annual ATCO in OPS employment cost (USD) – PPP adjusted

The 2020 median unit ATCO in OPS employment cost, after PPP adjustment, is USD 198,517. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was USD 198,592.

Indicator 3B: Annual Working hours per ATCO in OPS (Formula: ATCOs in OPS hours / No. ATCOs in OPS)

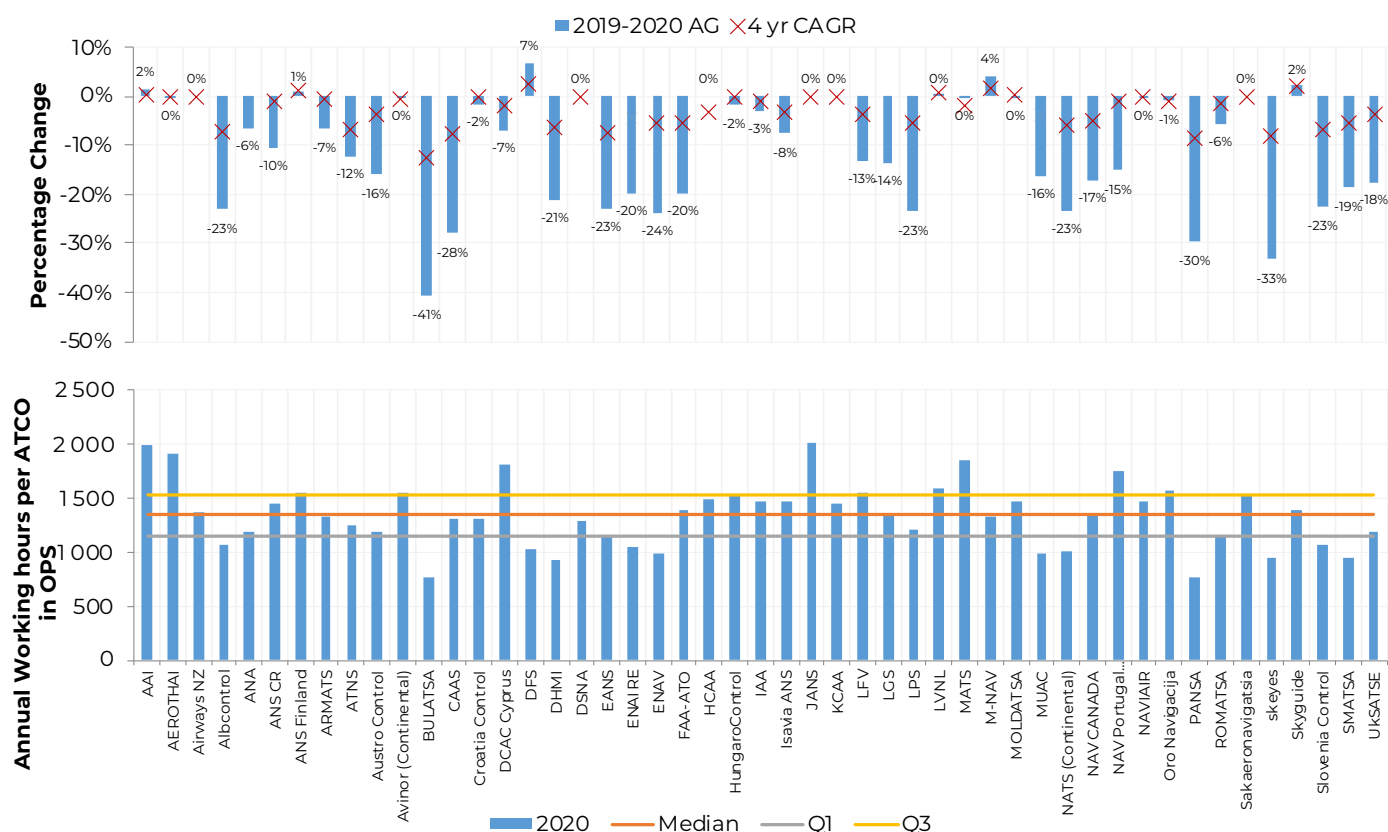


Figure 15 – Annual Working hours per ATCO in OPS

The 2020 median annual working hours per ATCO in OPS is 1,341 hours. Differences in this metric are influenced by the number of staff working full time. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was 1,459 hours.

Specific ANSP comments are outlined below.

AEROTHAI (Thailand)

AEROTHAI calculated FTE using total actual working hours divided by full-time equivalent working hours which is 160 hours per month for ATCO. This method of calculation is different from what we used to do and report to CANSO, therefore the KPI in this report is incomparable to KPI presented in the previous reports. Moreover, AEROTHAI will be adjusting FTE calculation for the next submission for 2022 report, according to the new definition of FTE.

Generic

The following justification is taken from the [ACE Report 2020](#).

Reductions in average hours on duty per ATCO in OPS were a widespread practice across ANSPs. In most cases these reductions result from less overtime and adaptation to the extremely lower traffic levels (e.g. short time work).

UKSATSE (Ukraine)

The following justification is taken from the [ACE Report 2020](#).

In the case of UKSATSE, the metric is impacted by the decrease of number of ATCOs in OPS, which reflect situations where the application of short-time work resulted in a downward adjustment of the number of ATCOs when expressed in full time equivalents.

Skyguide (Switzerland)

The following justification is taken from the [ACE Report 2020](#).

In the case of Skyguide, the metric is impacted by the decrease in the number of ATCOs in OPS, which reflects situations where the application of short-time work resulted in a downward adjustment of the number of ATCOs when expressed in full time equivalents.

Avinor (Norway)

The following justification is taken from the [ACE Report 2020](#).

For Avinor, the metric is impacted by the decrease in the number of ATCOs in OPS resulted mainly from temporary and permanent redundancies.

Indicator 3C: Annual IFR hours per ATCO in OPS (Formula: IFR flight hours / No. ATCOs in OPS)

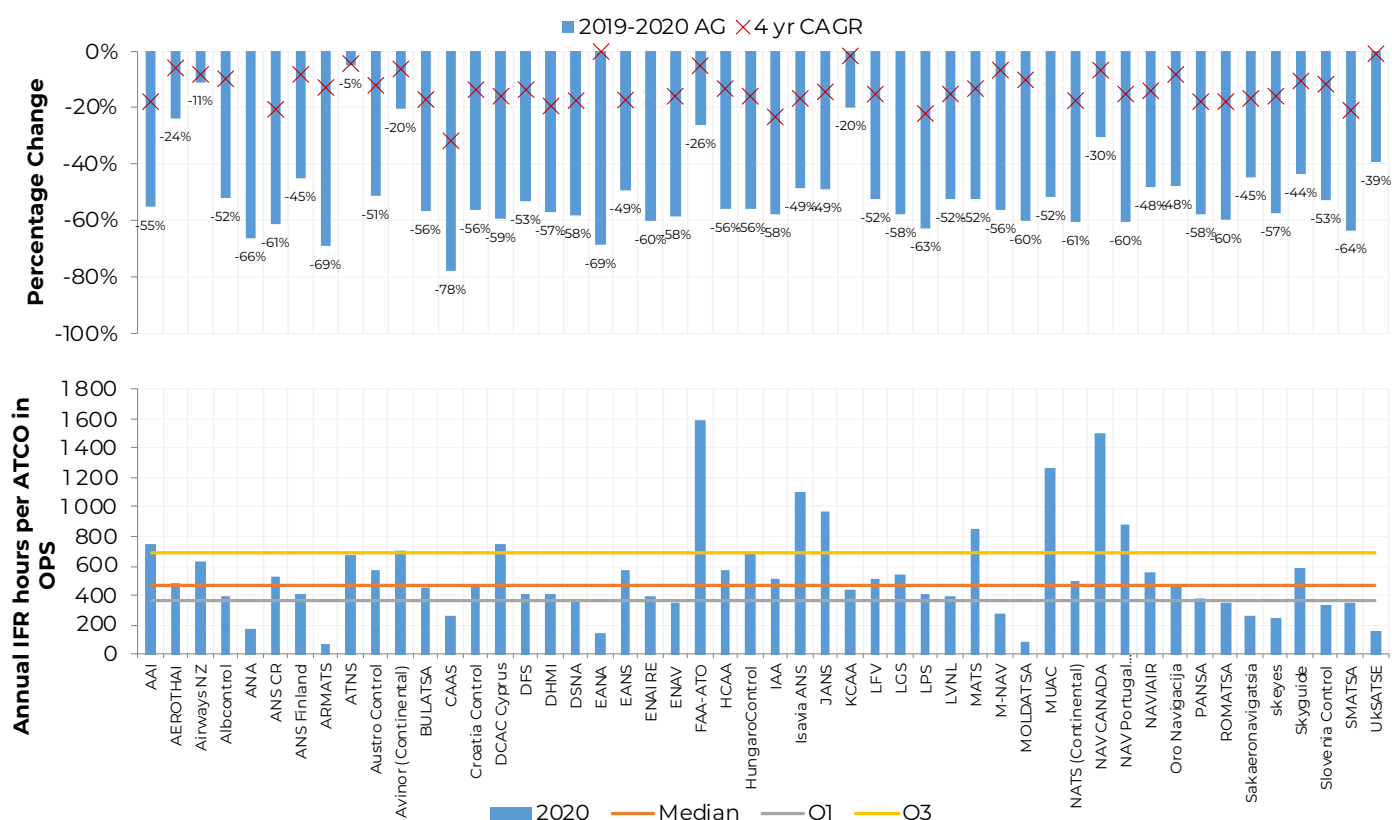


Figure 16 – IFR hours per ATCO in OPS

The 2020 median annual IFR hours per ATCO in OPS was 473 hours. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was 1,014.

Specific ANSP comments are outlined below.

AEROTHAI (Thailand)

AEROTHAI calculated FTE using total actual working hours divided by full-time equivalent working hours which is 160 hours per month for ATCO. This method of calculation is different from what we used to do and report to CANSO, therefore the KPI in this report is incomparable to KPI presented in the previous reports. Moreover, AEROTHAI will be adjusting FTE calculation for the next submission for 2022 report, according to the new definition of FTE.

FAA-ATO (USA)

FAA-ATO Productivity was not as impacted as other ANSPs because FAA-ATO did not have as large of a percent reduction in IFR flight hours. The FAA-ATO controls one of the largest airspace globally and still had cargo traffic even while passenger traffic was down.

Indicator 3D: Ratio of Frontline Service Staff to ATCO in OPS
(Formula: No. Frontline Service Support Staff / No. ATCOs in OPS)

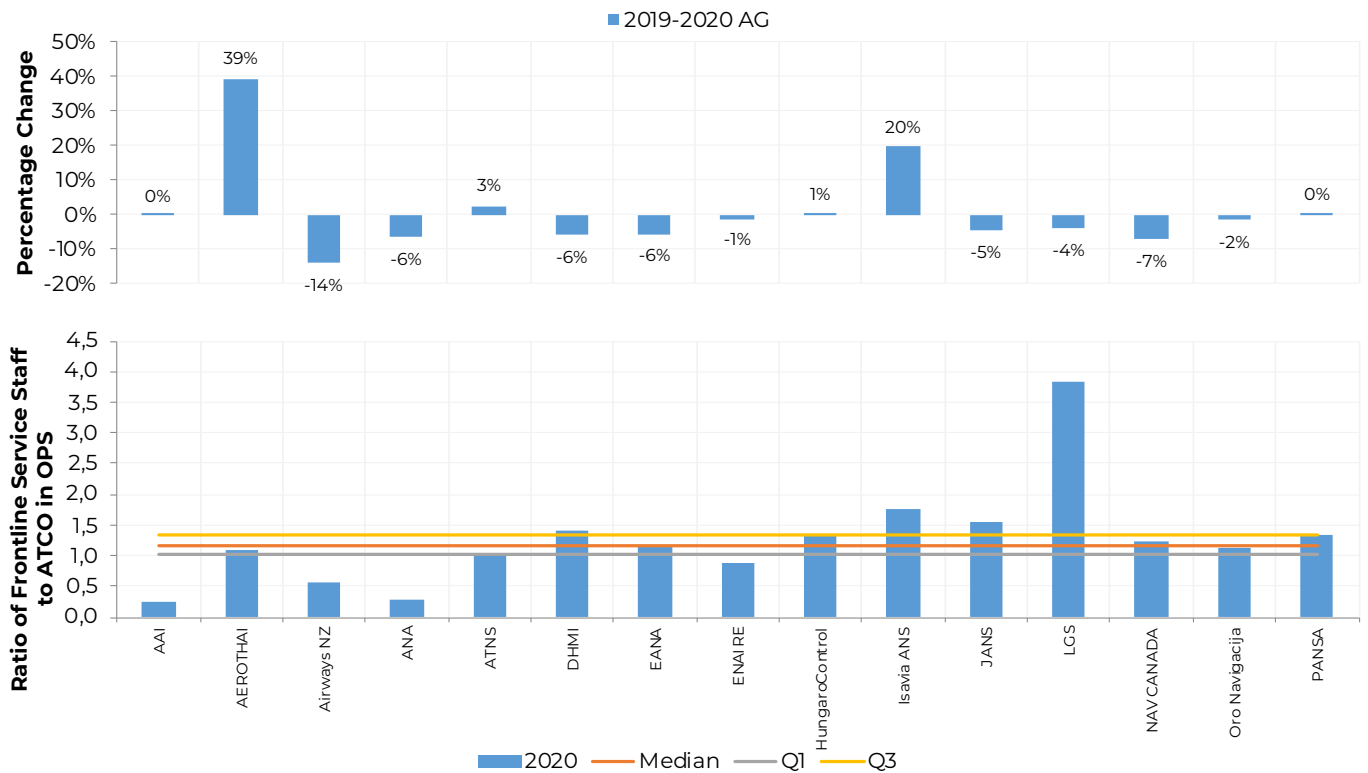


Figure 17 – Ratio of frontline service staff to ATCO in OPS

The 2020 median ratio of frontline service staff to ATCO in OPS is 1.16. All ANSPs submitting continental data for 2020 did so for 2019; the 2019 median was 1.23.

Please note there is no four year CAGR data points for this KPI because ANSPs have only submitted frontline service staff data since 2018.

Specific ANSP comments are outlined below.

AEROTHAI (Thailand)

AEROTHAI calculated FTE using total actual working hours divided by full-time equivalent working hours which is 160 hours per month for ATCO. This method of calculation is different from what we used to do and report to CANSO, therefore the KPI in this report is incomparable to KPI presented in the previous reports. Moreover, AEROTHAI will be adjusting FTE calculation for the next submission for 2022 report, according to the new definition of FTE.

OCEANIC COST EFFICIENCY AND PRODUCTIVITY: 2020

Indicator 1: Cost per IFR flight hour (USD) (Formula: Total costs / IFR flight hours)

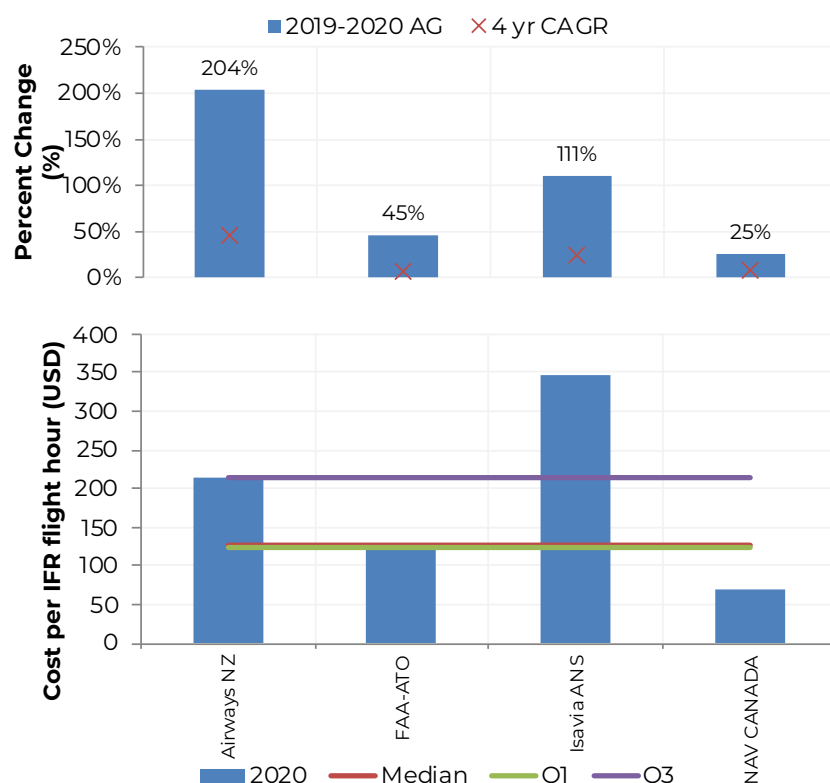


Figure 18 – Cost per IFR flight hour (USD)

The 2020 median cost per IFR flight hour is USD 126 (for comparison, this figure for continental flights is USD 896). The 2020 weighted average (taking into account total oceanic IFR flight hours per ANSP) cost per IFR flight hour is USD 127. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median for these ANSPs was 87 USD and weighted average was USD 88.

In terms of absolute total costs, all ANSPs saw reduction of total oceanic costs with a median reduction of 7% between 2019 and 2020.

Specific ANSP comments are outlined below.

Isavia ANS (Iceland)

Oceanic IFR hours dropped by almost 60% in 2020. This resulted in a significant increase in cost per IFR flight hour.

Indicator 2A: ATCOs in OPS employment cost per ATCO in OPS hour (USD)

(Formula: ATCOs in OPS employment costs / ATCOs in OPS Hours)

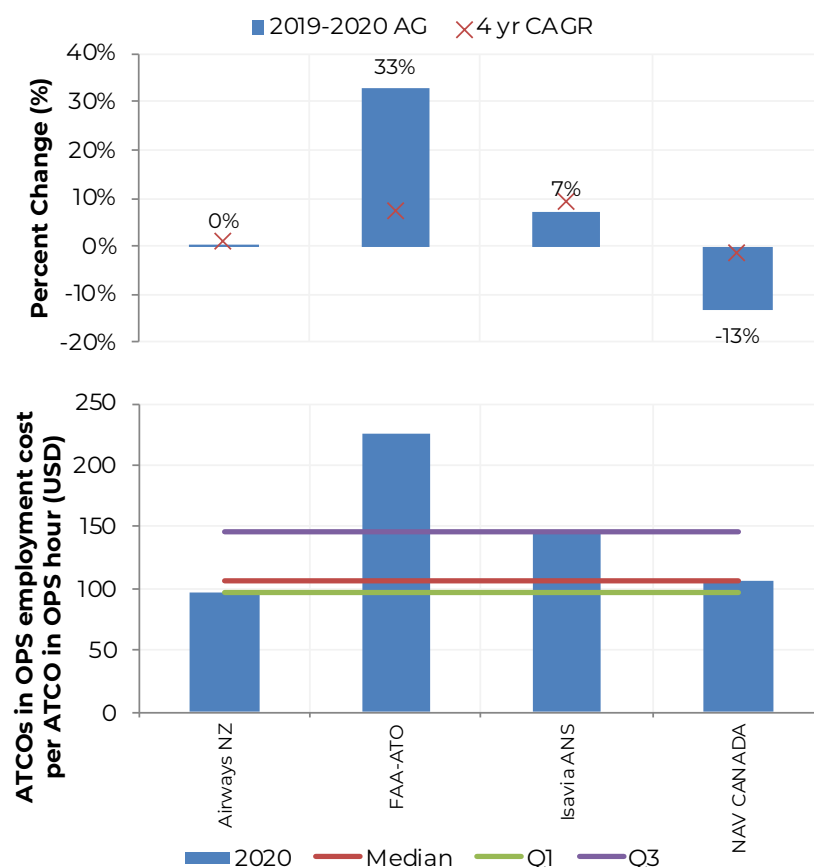


Figure 19 – ATCOs in OPS employment cost per ATCOs in OPS hour (USD)

The 2020 oceanic median employment cost per ATCO in OPS hour is USD 107. For comparison, the 2020 figure for continental airspace is USD 111. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median was USD 124.

Specific ANSP comments are outlined below.

FAA-ATO (USA)

FAA-ATO ATCO in OPS employment cost per ATCO in OPS hour is higher for oceanic than continental; an effect of the higher cost of living in the areas that cover oceanic traffic. In addition, ATCO in OPS hours went down in FY2020 as compared to FY2019.

Indicator 2A: ATCOs in OPS employment cost per ATCO in OPS hour (USD) – PPP adjusted

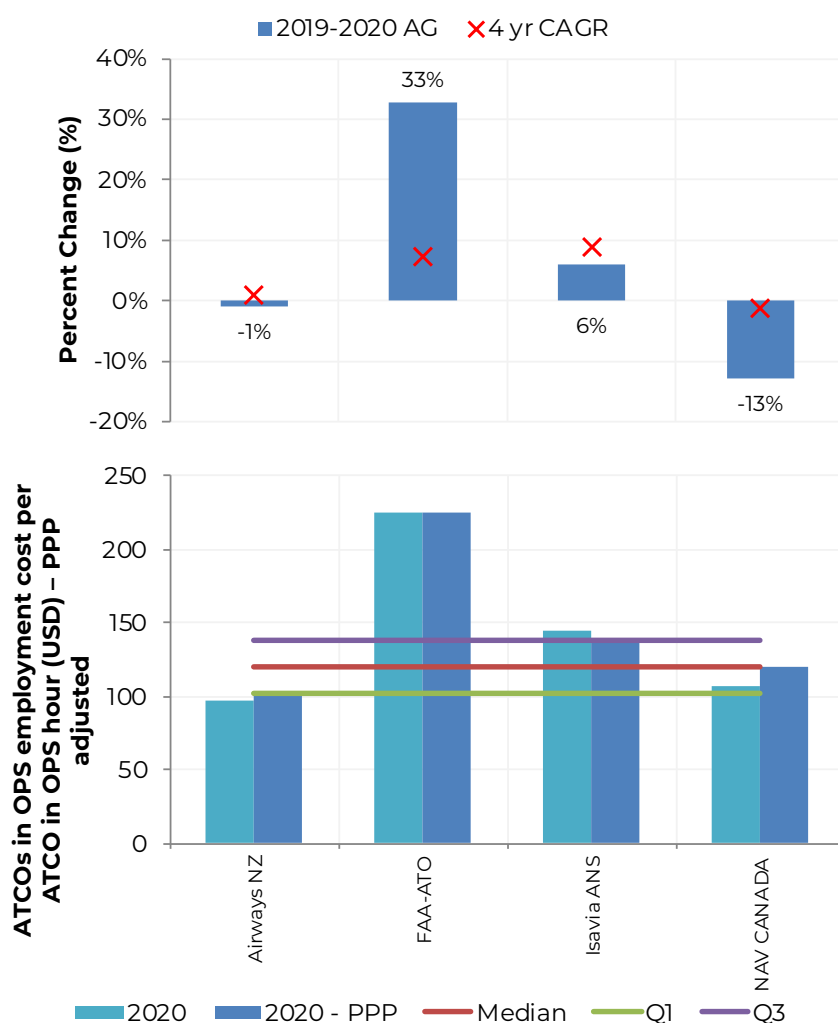


Figure 20 – ATCOs in OPS employment cost per ATCOs in OPS hour, PPP adjusted (USD)

The 2020 oceanic median employment cost per ATCO (PPP Adjusted) in OPS hour is USD 121, the median figure for continental airspace is USD 139. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median was USD 130.

Indicator 2B: ATCOs in OPS hour productivity (Formula: IFR flight hours / ATCOs in OPS hours)

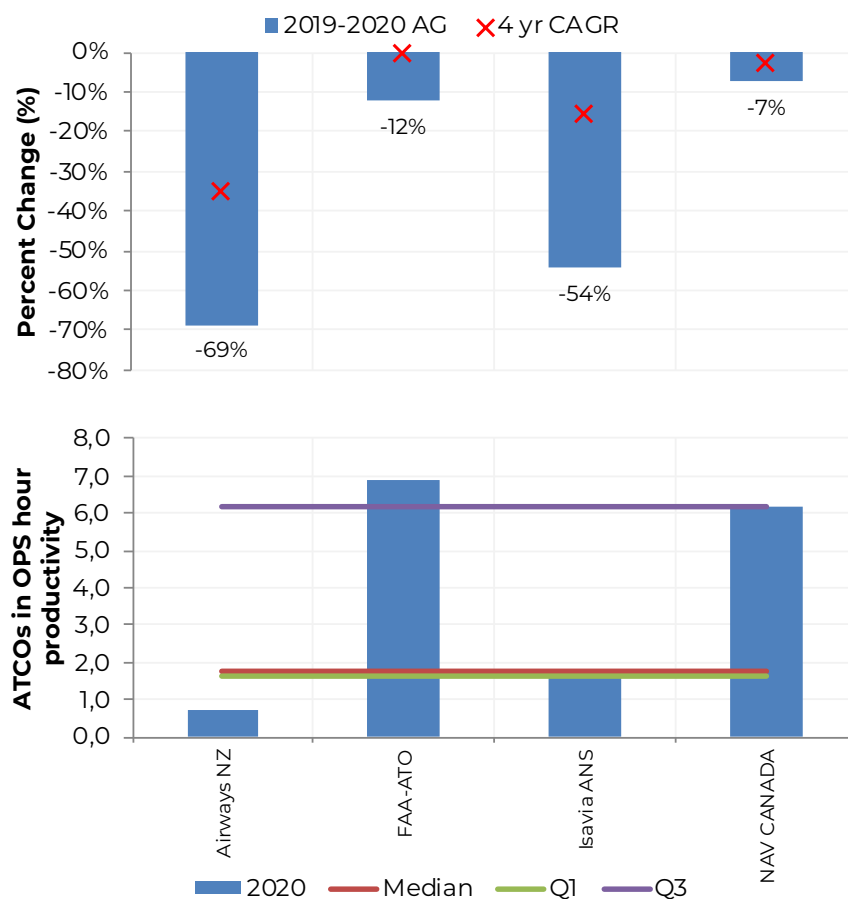


Figure 21 – ATCOs in OPS hour productivity

The 2020 median ATCOs in OPS hour productivity is 1.74 IFR flight hours per ATCO in OPS hours, significantly higher than the continental figure of 0.38. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median is 3.80.

Specific ANSP comments are outlined below.

Isavia ANS (Iceland)

Due to the significant reduction in traffic in 2020 there was a sizeable effect on ATCO productivity.

Indicator 2C: Costs excluding ATCOs in OPS employment costs per IFR hour (USD)

(Formula: Costs excluding ATCOs in OPS employment costs / IFR flight hours)

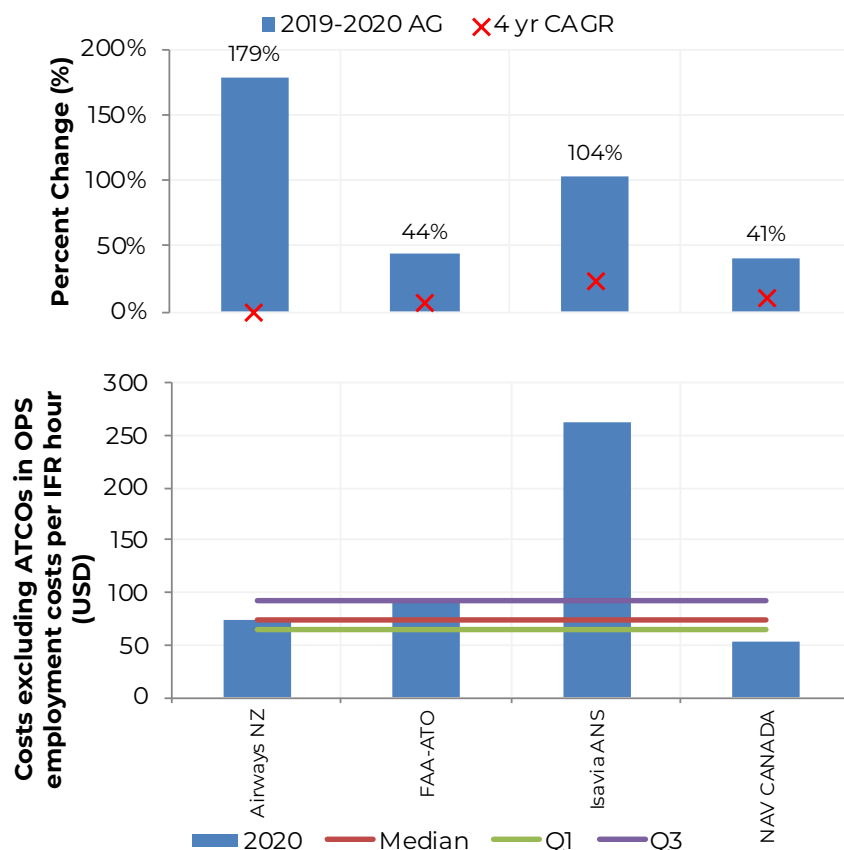


Figure 22 – Cost excluding ATCOs in OPS employment costs per IFR flight hour (USD)

The 2020 median cost excluding ATCOs in operations employment cost per IFR flight hour is USD 75. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median was 50.

In terms of absolute total costs, all ANSPs saw reduction of oceanic costs excluding ATCOs in OPS employment costs with median reduction of 4% between 2019 and 2020.

Specific ANSP comments are outlined below.

Isavia ANS (Iceland)

Any data using IFR hours for 2020 was greatly affected by the sharp reduction in traffic due to the COVID-19 pandemic.

Indicator 2D: Proportion of total costs made up of ATCO in OPS employment costs
 (Formula: ATCO in OPS employment costs/Total Costs)

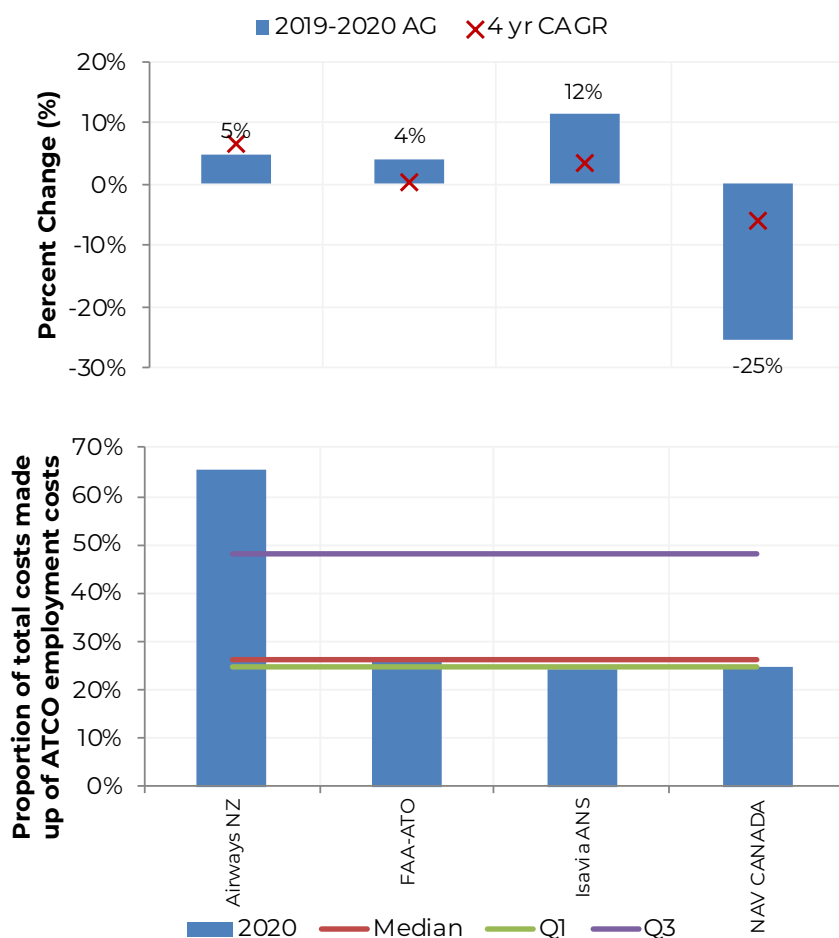


Figure 23 – Proportion of total costs made up of ATCO in OPS employment costs (USD)

The 2020 median for the proportion of total costs made up of ATCO in OPS employment costs is 26%. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median was 33%.

Indicator 3A: Annual employment cost per ATCO in OPS (USD)

(Formula: ATCOs in OPS employment costs / No. ATCOs in OPS)

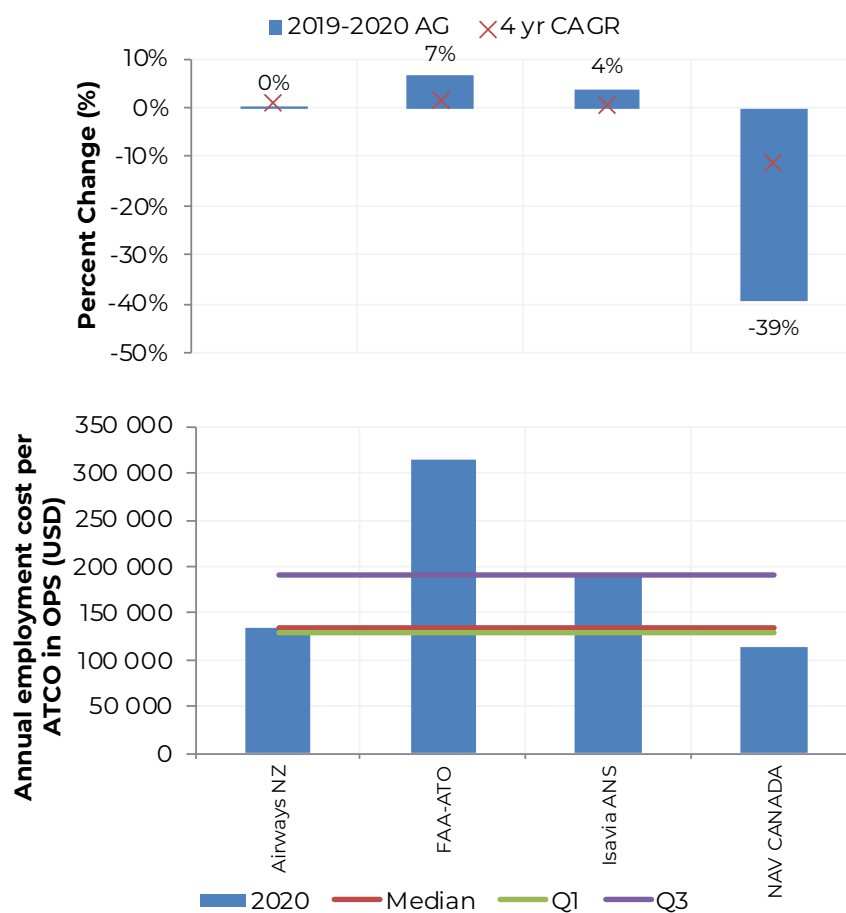


Figure 24 – Annual ATCO in OPS employment cost (USD)

The 2020 median unit ATCO in OPS employment cost is USD 133,323. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median was USD 183,240.

Indicator 3A: Annual employment cost per ATCO in OPS (USD) – PPP adjusted

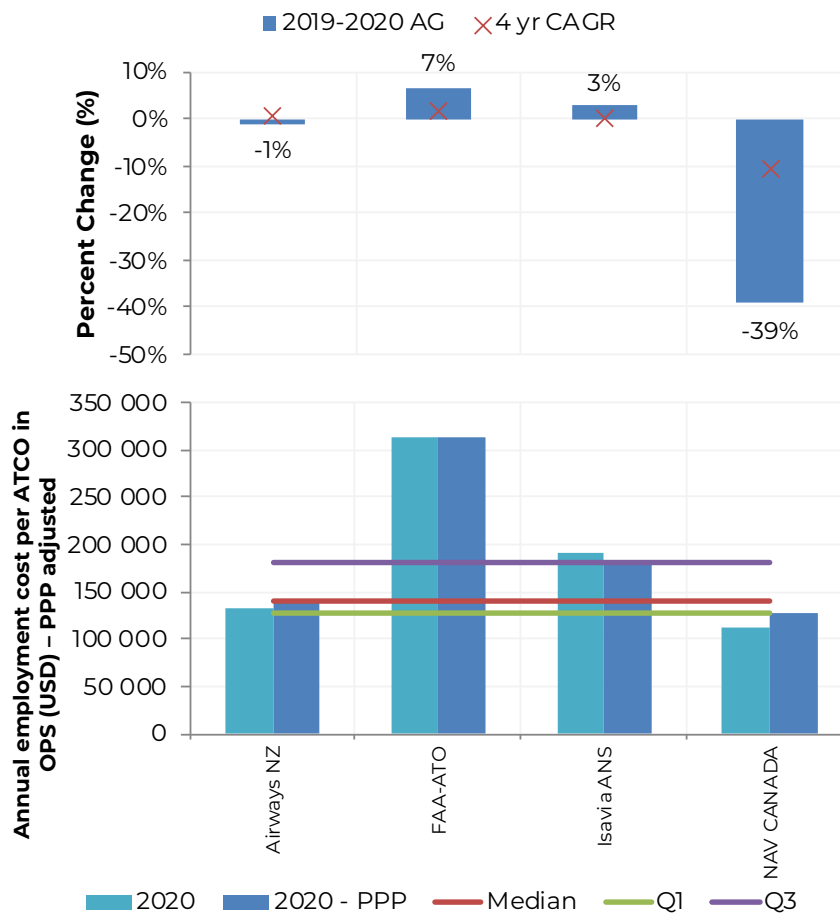


Figure 25 – Annual ATCO in OPS employment cost (USD) – PPP adjusted

The 2020 median unit ATCO in OPS employment cost, after PPP adjustment, is USD 140,528. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median was USD 175,871.

Indicator 3B: Annual Working hours per ATCO in OPS

(Formula: ATCOs in OPS hours / No. ATCOs in OPS)

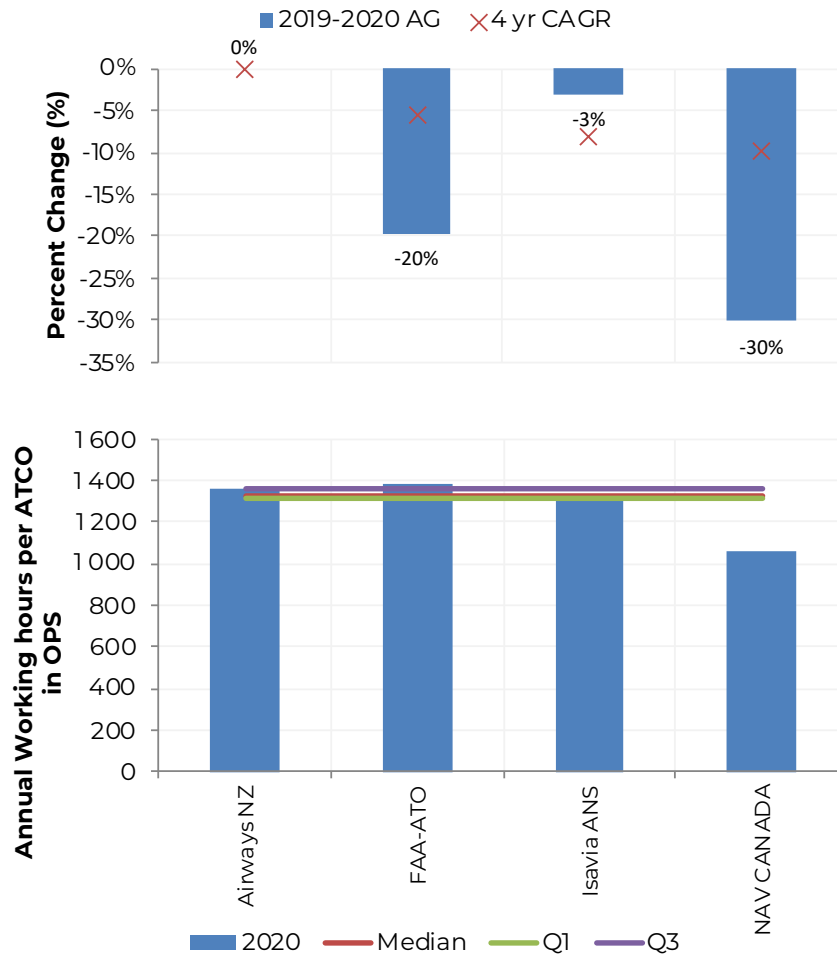


Figure 26 – Annual Working hours per ATCO in OPS

The 2020 median annual working hours per ATCO in OPS is 1,330 hours. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median was 1,516 hours.

Indicator 3C: Annual IFR hours per ATCO in OPS

(Formula: IFR flight hours / No. ATCOs in OPS)

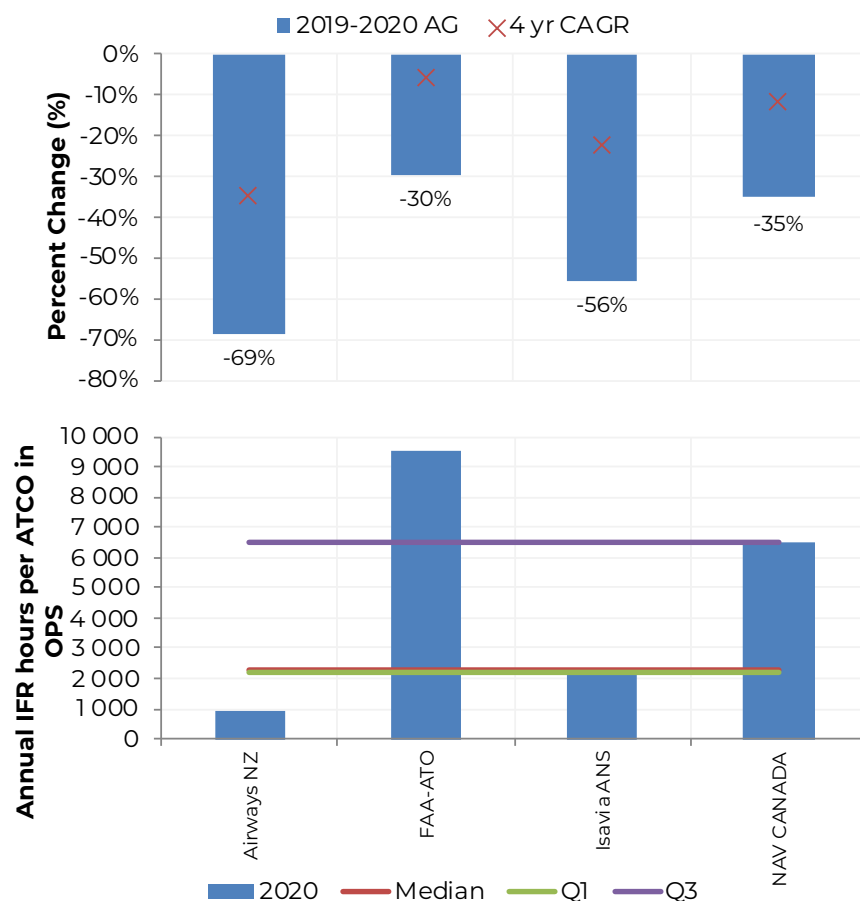


Figure 27 – IFR hours per ATCO in OPS

The 2020 median annual IFR hours per ATCO in OPS was 2,276 hours. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median was 5,144.

Specific ANSP comments are outlined below.

Isavia ANS (Iceland)

Any data using IFR hours for 2020 was greatly affected by the sharp reduction in traffic due to the COVID-19 pandemic.

Indicator 3D: Ratio of Frontline Service Staff to ATCO in OPS
 (Formula: No. Frontline Service Support Staff / No. ATCOs in OPS)

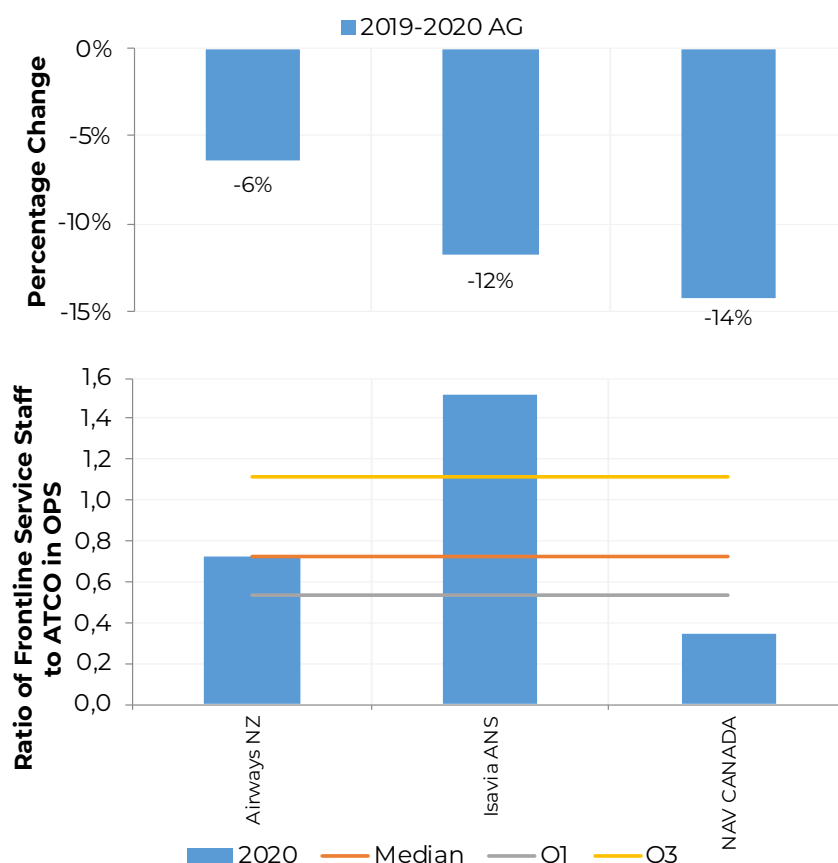


Figure 28 – Ratio of frontline service staff to ATCO in OPS

The 2020 median ratio of frontline service staff to ATCO in OPS is 0.72. All ANSPs submitting oceanic data for 2020 did so for 2019; the 2019 median was 0.77.

There is no four year CAGR data points for this KPI because ANSPs have only submitted frontline service staff data since 2018.

Specific ANSP comments are outlined below.

Isavia ANS (Iceland)

Isavia ANS would like to point out that roughly 90% of our operations are Oceanic, therefore, the ratio of frontline support staff is relatively higher than other larger ANSP's whose continental operations represent a larger proportion of their total service.

JOINT CONTINENTAL AND OCEANIC COST EFFICIENCY: 2020

Indicator CO1: Cost per IFR hour (USD) (Formula: Total costs / IFR flight hours)

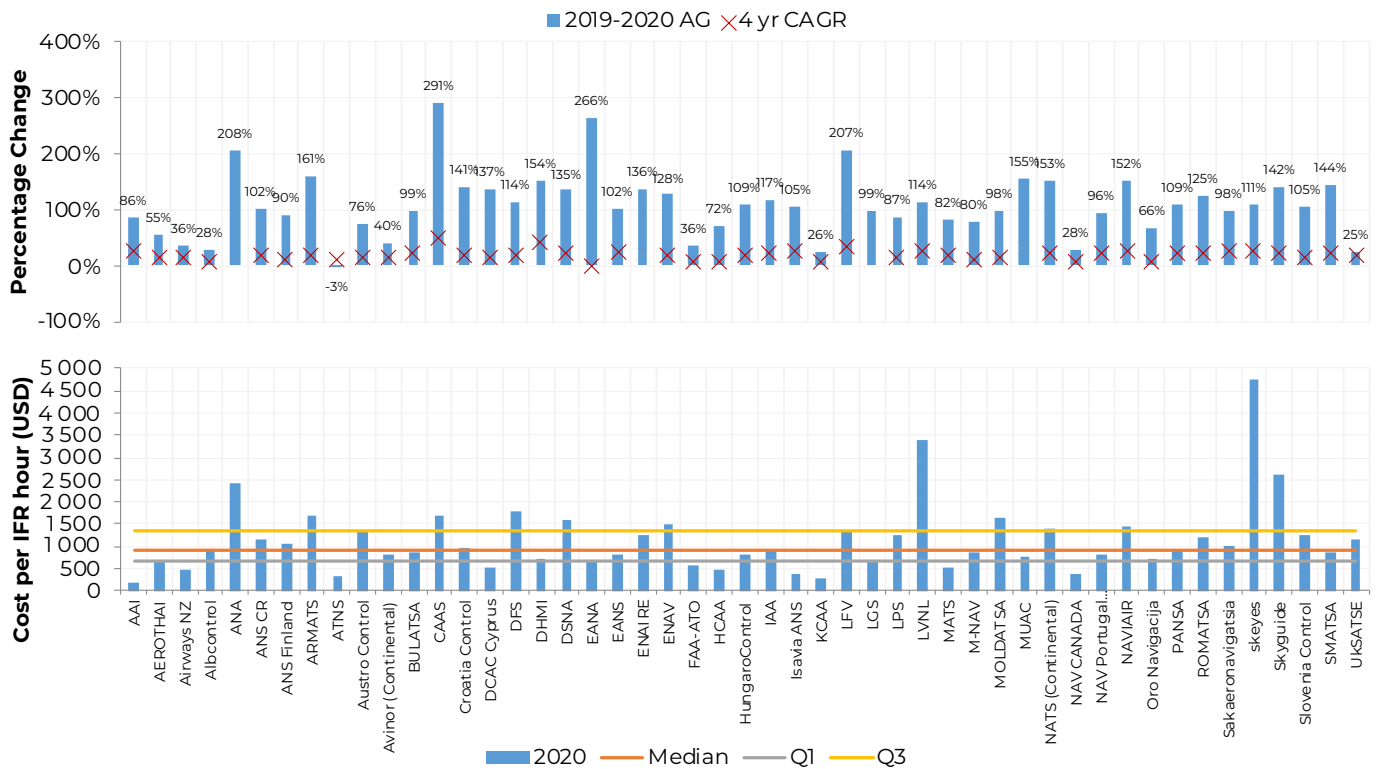


Figure 29 – Cost per IFR flight hour (USD)

The 2020 median cost per IFR flight hour is USD 895. The 2020 weighted average (taking into account total continental and oceanic IFR flight hours per ANSP) cost per IFR flight hour is USD 664. All ANSPs that submitted in 2020 did so in 2019; the 2019 median was USD 439 and weighted average was USD 421.

Indicator CO2D: Employment cost of ATCOs in OPS as a percentage of total costs

(Formula: ATCOs in OPS employment costs / Total costs)

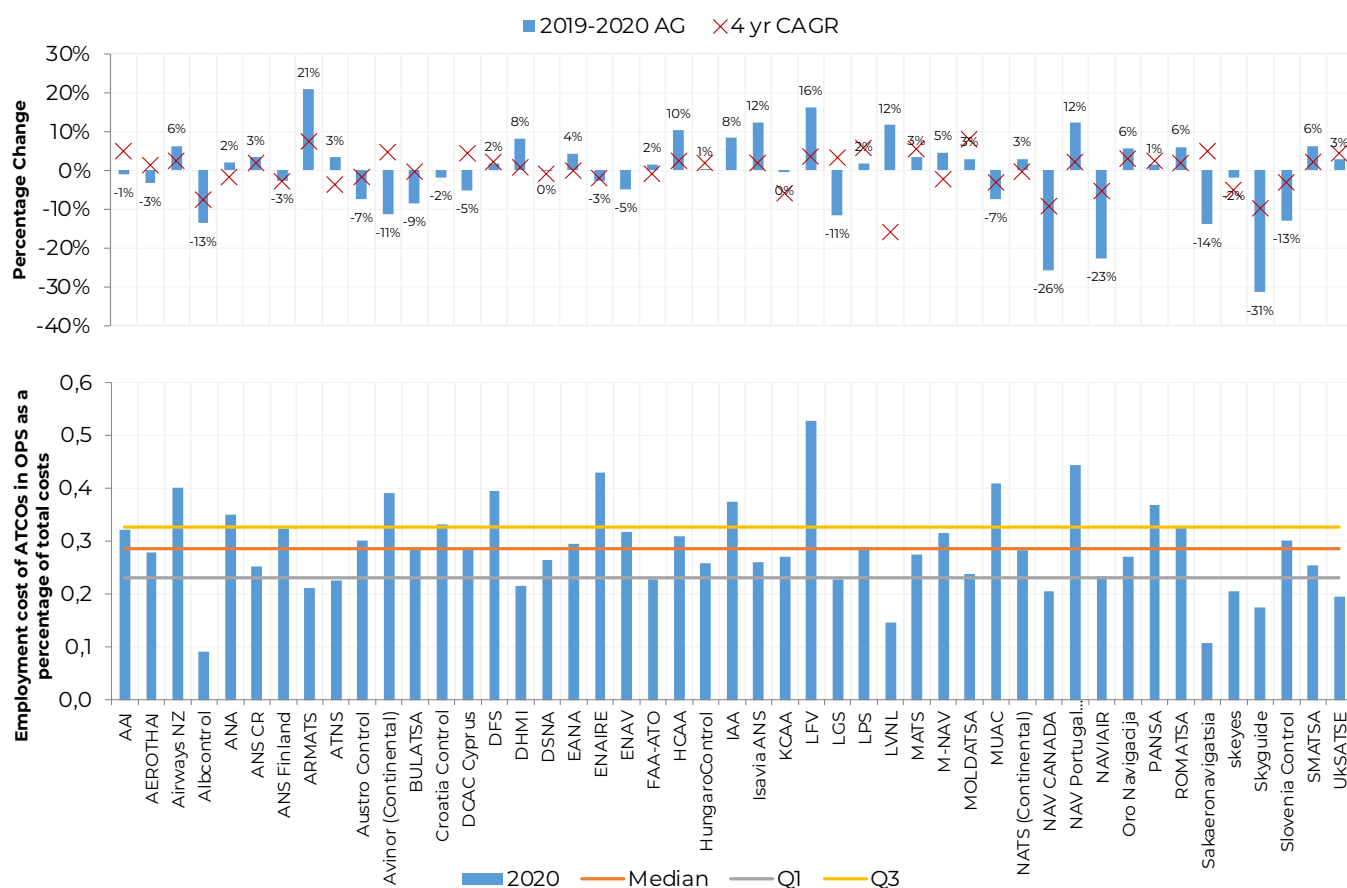


Figure 30 – Employment cost of ATCOs in OPS as a percentage of total cost

The 2020 median employment cost of ATCOs in OPS as a percentage of total costs is 29%. All ANSPs that submitted data in 2020 did so in 2019; the 2019 median was 28%.

SUMMARY OF PERFORMANCE TRENDS

KEY FINDINGS

- Cost efficiency and ATCO productivity were severely impacted with a sudden and unprecedented loss of traffic due to pandemic related travel restrictions;
- Accelerated increases in ATCO employment costs per ATCO hour compared to those recorded in the previous years and despite a reduction in overtime hours;
- Similarly to the total costs, costs excluding ATCO in OPS employment costs per IFR flight hour impacted with the drop of traffic.

As anticipated in last year's report, the COVID-19 pandemic significantly impacted ANSP performance and the 2020 data. A dramatic drop in IFR flight hours naturally worsened all the main indicators, with costs and ATCO hours not falling at a proportional rate, as ANSPs have been required to keep their airspace open during the pandemic, but with severely depleted traffic.

Analysis presented in the *Impact of COVID-19 on 2020 performance* shows that ANSPs use different fiscal and reporting years. As a result, their data has been differently affected by the reduced traffic, local border policies and the timing of waves of the pandemic.

COST EFFICIENCY

In the case of total cost efficiency, almost all of the 52 ANSPs experienced an increase in cost per IFR flight hour, compared to 60% in 2019 and only 43% in 2018, when comparing the same set of ANSPs. The rate of traffic growth was completely lost in 2020, with combined IFR flight hours going from growth of 1.6% (2018-2019) to loss of 38.5% (2019-2020), when comparing the same set of ANSPs.

PRODUCTIVITY

98% of ANSPs saw a decrease in their ATCO productivity, compared to 60% experiencing an increase in productivity in 2019. When comparing the same set of ANSPs, the total number of continental and oceanic ATCO in OPS hours decreased by 15.3% (2019-2020), while total number of ATCO in OPS decreased by 1.5% (2019-2020).

FUTURE PERFORMANCE

In an industry that is today still experiencing the impacts of the COVID-19 pandemic, the challenge will be to recover ATCO productivity and cost efficiency in a sustainable manner by incorporating solutions that ensure ANSPs improve their resilience to future changes in traffic demand.

The year 2019 will be regularly referred to as a reference year for normal traffic levels. However, it must be kept in mind that, as shown in the last year's report, slowing traffic growth in 2019 resulted in a number of the key trends from previous years being reversed.

If you are interested in participating in next year's report or the CANSO GBWG, then please get in touch via info@canso.org.

RELATED CANSO BENCHMARKING ACTIVITIES

CANSO conducts a variety of benchmarking exercises to examine developments in the industry. Combining these allow for a greater understanding of the current initiatives and trends occurring across the aviation industry, contextualising the ANS performance analysis within this report. The following input has kindly been provided by the CANSO Safety Intelligence Work Group (SIWG).

CANSO SAFETY INTELLIGENCE WORK GROUP

The CANSO SIWG champions safety measurement and continuous improvement of safety performance. Consisting of representatives from ANSPs across the globe, this group works to analyse, advise, and advance safety performance measurement, and reports to the global¹¹ CANSO Safety Forum.

SAFETY PERFORMANCE

Safety is critical for the trust and confidence of the flying public. As a result, CANSO measures key safety performance indicators to contribute to improvements in safety and efficiency of air traffic control. When productivity and cost efficiency are measured, it becomes crucial to measure safety benchmarks, which rely on the inter-dependencies these three facets represent. Improvements in productivity and cost efficiency should never come at the cost of reduced safety.

Safety and safety performance are measured in several ways, both through proactive indicators of the CANSO Standard of Excellence (SoE) in Safety Management Systems (SMS) and event-based indicators of loss of separation and runway incursions.

This ensures that globally, ATM stakeholders understand how today safety performance drives tomorrow's improvements – inspiring CANSO members to be future-focussed.

After a hiatus due to the COVID-19 pandemic, data submission was re-established in 2021 for the data captured in calendar year 2020.

Note: Results from the CANSO Standard of Excellence in Safety Management Systems have been omitted from this report. In the spirit of collaboration, the SMS Maturity results should not be used to showcase performance in an external setting. The assessment is meant to drive internal efforts to improve areas of an ANSP's SMS that are found to be lacking, as well as to encourage the adoption of world-leading practices. Any comparison with other ANSPs should be made for this purpose only. Unfortunately, a small number of ANSPs have extended the use of the results outside of this intended scope. Through productive discussions we are hopeful these challenges will be corrected, and results can be provided in the next edition.

ATM GROUND IFR-IFR LOSSES OF SEPARATION¹²

A loss of separation is a key performance indicator for assuring compliance with applicable separation standards. This measure focuses on IFR-IFR losses (both aircraft flying under instrument flight rules).

There are multiple measures for safety performance, CANSO has prioritised this measure over others as a benchmark based on the risk profiling around potential loss of life.

For 2020, 19 ANSPs submitted data on the loss of separation rates. The annual rate for these ANSPs was 59.61 IFR-IFR losses of separation per 1 million IFR flight hours and 2.50 per 100,000 IFR flights.

¹¹ In the context of this report, "global" means the "participating ANSPs".

¹² ATM Ground IFR-IFR Losses of Separation is a specific term that implies a loss of separation where the ANSP (its systems, personnel actions, processes, etc.) had a level of contribution, either direct or indirect, to the sequence of events leading up to, or recovering from, the occurrence.

There were no reported losses considered as high severity in the Risk Analysis Tool (RAT) classification scheme¹³ (which differs from the ICAO runway incursion severity classification). The RAT severity classification describes the level of consequences of hazards on the safety of flight operations. It combines the level of loss of separation and the degree of ability to recover from a hazardous situation. The overall severity of one occurrence is composed of risk of collision/proximity (separation and rate of closure) and the degree of controllability over the incident.

From the diagram below, 67% of the IFR-IFR losses of separation had the lowest RAT severity (E). 49% of losses occurred in Terminal environment and 35% in en-Route. The remaining 17% were not provided for analysis.

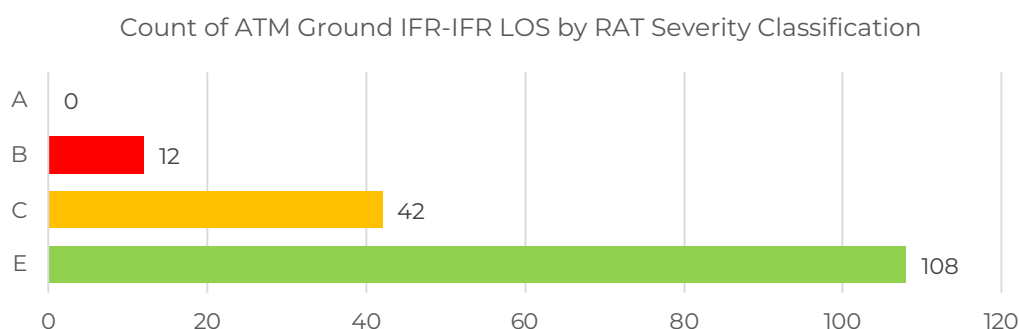


Figure 31 – ATM Ground IFR-IFR LOS by RAT Severity Classification in 2020

RUNWAY INCURSIONS

A high proportion of safety events take place around the vicinity of an airport's runway(s). Again, there are multiple measurements for safety around an aerodrome. Here, CANSO has selected to measure runway incursions due to the increased likelihood that an ANSP may have contributed to the event.

In 2020, the rate of runway incursions for the ANSPs who submitted data was 5.37 RIs per 100,000 runway movements (one runway incursion for approx. every 19,000 take offs and landings). The rate of ATC-Attributed runway incursions was 0.90.

Below are graphs summarising the attribution (the primary causal element) and severity (based on ICAO classification scheme) for these events. It is worth noting that most runway incursions were attributed to pilot deviation. No explanatory details are available for analysis which opens opportunities for further collaboration across industry partners.

Events assessed at ICAO runway incursion severities A and B contribute about 3% of all runway incursions regardless of attribution.

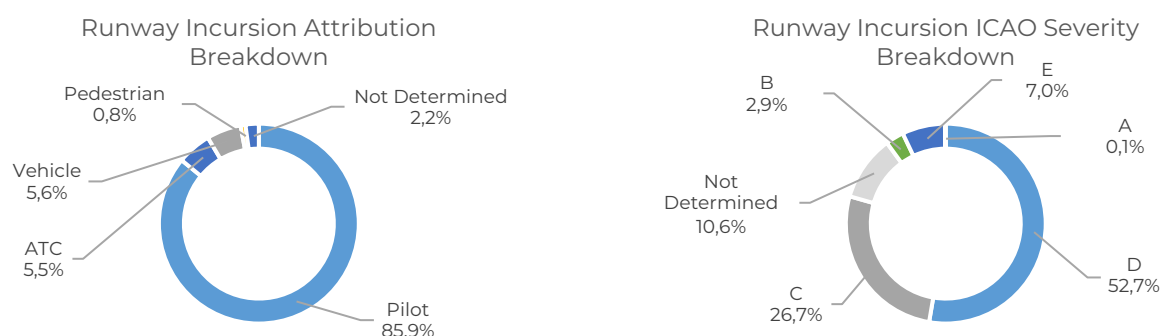


Figure 32 – Runway Incursion Attribution and ICAO Severity Breakdown

¹³ Please refer to <https://skybrary.aero/articles/risk-analysis-tool-rat> for a description of the RAT framework.

In terms of weather and lighting conditions, 61% occurred in visual meteorological conditions, and 62% in day-light conditions respectively.

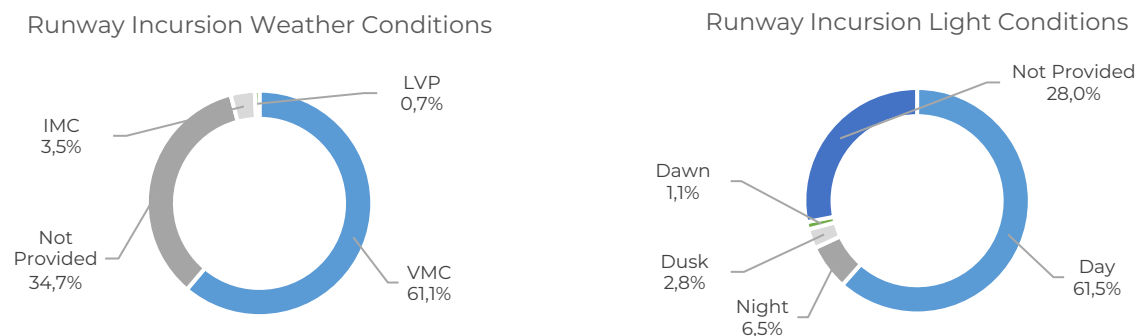


Figure 33 – Runway Incursion Weather and Light Conditions

The details of the ICAO Severity Classification Scheme are below.

Severity classification	Description*
A	A serious incident in which a collision is narrowly avoided.
B	An incident in which separation decreases and there is significant potential for collision, which may result in a time-critical corrective/evasive response to avoid a collision.
C	An incident characterized by ample time and/or distance to avoid a collision.
D	An incident that meets the definition of runway incursion such as the incorrect presence of a single vehicle, person or aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences.
E	Insufficient information or inconclusive or conflicting evidence precludes a severity assessment.

Figure 34 – ICAO Severity Classification Scheme

ANNEX 1: METHODOLOGY

MEASURING PERFORMANCE

Cost efficiency and productivity are two key indicators of measuring the performance of air navigation service provision. They demonstrate how ANSPs are delivering value and serve as indicators of operational efficiency. These KPIs are all part of the *CANSO ANS Performance Framework*.

COST EFFICIENCY

Cost efficiency provides an indication of the balance between operational effectiveness (i.e. ATCO productivity) and the cost of providing the service.

The simplest indicator of cost efficiency is the cost of providing **ANS services per IFR flight hour**. A lower cost per flight hour, however, is not necessarily indicative of greater overall performance.

Economic differences outside of the control of ANSPs can drive differences in costs. This includes labour contracts, salary scales and working conditions (such as hours), as well as government regulations on pension management and mandatory financial controls. Furthermore, ANSPs do not control the volume of traffic, which is a function of economic activity and other air passenger demands. Where a minimum level of service is required, there is a limit to how activities can be scaled down in response to lower demand. This was particularly evident in 2020, the year considered in this report.

Cost indicators do not reflect external factors, other performance areas or the quality of service. Moreover, there are costs associated with providing a safer and more punctual, predictable, and efficient service, which can deliver savings to air operators flying in the airspace that offset higher ANSP costs. Costs are broken down into ATCOs in OPS employment and other costs. Other costs include operating costs (excluding ATCO in OPS employment costs), depreciation/amortisation and costs of capital related to providing ATC/ATFM services. They do not include MET costs.

PRODUCTIVITY

The key indicator of ANS productivity is **IFR flight hours per ATCO in OPS hour**, often described as 'ATCO in OPS productivity'. Although generally reflective of ANSPs' performance, factors beyond the control of the ANSP can cause low levels of productivity – for example a geopolitical event that alters traffic demand.

ATCO in OPS productivity is driven by traffic levels and an ANSP's ability to utilise its ATCOs in operations (OPS) resources. Although they cannot affect traffic demand, ANSPs may improve productivity by utilising flexible rostering and adapting airspace configuration to open and close sectors according to evolving traffic patterns.

Furthermore, advances in technology are now focusing more than ever on reducing the workload of ATCOs in OPS to enable them to safely manage higher levels of traffic in a given volume of airspace. Training associated with the introduction of technology, however, can lead to short-term reductions in productivity.

Airspace complexity also affects ATCO in OPS productivity. Lower airspace will typically have lower levels of ATCO in OPS productivity than upper airspace where aircraft are flying at more consistent altitudes and on non-crossing routes. Therefore, an ANSP operating a high proportion of sectors in lower airspace, or with numerous busy airports with complex approach sectors, is likely to have lower ATCO in OPS productivity than an ANSP with more overflights at higher altitude.

DATA PROCESSING

Data collection:

ANSPs who are members of the CANSO GBWG provided data for this analysis. ANSPs either submit the minimum dataset required for participation in the report (the basic data), or additional data to inform the analysis of advanced KPIs (the advanced data). ANSPs can also revise data submitted in previous years. The data submission workbook includes validation calculations that ANSPs are encouraged to consult in the data collection phase.

The entire dataset is available to all participating ANSPs to enable closer analysis and evaluation of performance trends. The advanced KPI dataset is only available to ANSPs submitting advanced data.

2020 performance data for European ANSPs has been kindly provided by EUROCONTROL, alongside data for the years 2016 – 2019 to facilitate historical trends analysis, which are completed with the extended set of ANSPs to ensure validity of any trend analysis. European ANSP members of the CANSO GBWG, who also submit data to EUROCONTROL have their ACE data used in this analysis, unless otherwise agreed.

It should be noted that Indicator 2B 'ATCO productivity' is not directly comparable to the ATCO productivity KPI used in the ACE report. This is because the CANSO ANS Performance Framework uses IFR flight hours to calculate this KPI, rather than composite flight hours as used in the ACE report ATCO productivity KPI.

Finally, as part of the data sharing agreement with EUROCONTROL, CANSO data is only available to the core EUROCONTROL analysts and is not shared with the wider ACE report ANSP community.

Data Dashboard:

As part of the CANSO 2016-2020 data collection cycle, a PowerBI dashboard was produced in November 2021, which allowed CANSO members a first look at trends in their data. This dashboard, and accompanying underlying data document provided members the opportunity to thoroughly review and validate their data submission, and notify Egis of any amendments if necessary.

Data processing:

Data has been processed by Egis subject to a data processing agreement with CANSO and in accordance with European data privacy laws. It was subject to a one-step quality check for significant changes, potential errors or omissions and is subject to continued revision by participating ANSPs.

Separation of continental and oceanic data:

Information is provided both for continental and oceanic air navigation services, where applicable. Each of these environments has different challenges associated with providing ANS. For example, it is more straightforward to provide ground infrastructure for communications and surveillance services in continental airspace than it is over oceans.

Exchange rate conversion:

ANSPs submit data in their chosen currency. For KPI comparison, data is presented in USD. 2020 KPI data is converted using exchange rates provided by each ANSP or using data available from the Organisation for Economic Co-operation and Development (OECD) website. Exchange rates for some countries are unavailable using OECD; International Monetary Fund (IMF) exchange rates have been used in such situations.

For ANSPs that operate in a currency other than the USD, the assumption of lower cost may be caused in part by the strengthening USD. Between 2015 and 2016, the USD appreciated against most other world currencies, meaning each USD buys more foreign currency. Despite a dip in 2017, the USD once again strengthened in 2018. This change in the relative value of the dollar effectively lowers the price that ANSPs incur in USD.

Growth rates:

Data is presented from 2020 and then for the one-year and four-year trends. The trend over four years is calculated as the compound annual growth rate (4 yr. CAGR). This shows the overall trend between 2016 and 2020, but masks the fluctuations that may have taken place over the intervening years. In addition, if 2016 was an outlier, this trend may not be representative of the trend over this timeframe. Individual ANSP results for 4 yr. CAGR should therefore be interpreted alongside contextual information.

The trend analysis is presented above the 2020 KPI data and is based on the data submitted in the ANSP's chosen currency.

Inflation:

The growth rates are not adjusted for inflation, and local inflation rates should therefore be considered when interpreting AGR trends. PPP correction: Salaries and the cost of living vary extensively around the world. One way to correct for this is by using purchasing power parity (PPP). Employment costs for ATCOs in OPS are corrected using IMF data. There are, of course, limitations to this approach, as the cost of living can vary widely within a country and may be higher or lower in the region where ANS offices are located.

Median:

The median is the middle number of the data set.

Q1 and Q3:

The first quartile (Q1) is defined as the middle number between the smallest number and the median of the data set. The third quartile (Q3) is the middle value between the median and the highest value of the data set.

ANNEX 2: DATA DEFINITIONS

CONTEXTUAL DATA ELEMENT DEFINITIONS

Data Element	Definitions
IFR hours per sq. km	This is the result of dividing the number of IFR flight hours for the current year of data by surface area (in square kilometres).
Sq. km – oceanic and continental	The size (the surface area) of the airspace for which an ANSP is responsible. This should include the area where ANS have been delegated to the ANSP by another provider, and exclude the area in which ANS have been delegated to another ANSP. The sq. km here should be consistent with ACC coverage with respect to total area. Differentiation for facilities controlling only upper or lower airspace will be addressed by item 3 below. (Source: PRU D1).
Percentage surveillance coverage at 30,000ft – primary radar	Surveillance coverage from primary radar.
Percentage surveillance coverage at 30,000ft – secondary radar	Surveillance coverage from secondary radar.
Percentage surveillance coverage at 30,000ft – ADS-B	Surveillance coverage from ADS-B.
Percentage surveillance coverage at 30,000ft – Space based ADS-B	Surveillance coverage from space-based ADS-B.
Percentage ADS-C coverage at 30,000 ft	Surveillance coverage from ADS-C.
Number of FIRs	A Flight Information Region is airspace of defined dimensions within which flight information service and alerting service are provided.
Number of ACC facilities	ACC facilities are the ATC units providing ATC services to en-route traffic in control areas under its jurisdiction. Part of an ACC may also provide approach services.
Number of co-located ACC and approach facilities	An ACC unit is described above. An approach control unit is an ATC unit providing ATC services to arriving, departing and over-flying flights within the airspace in the vicinity of an airport.
Number of stand-alone approach facilities	Definition of an approach control unit is above.
Number of co-located approach and tower facilities	Definition of an approach control unit is above. Tower facilities, or a tower control unit, is an ATC unit at an airport responsible for the provision of ATC services in respect of flights that are landing and taking off and other traffic that is on the active runway(s).
Number of co-located approach, tower and ACC facilities	For definitions see above.
Number of stand-alone towers	Definition of a tower control unit is above.

INPUT DATA DEFINITIONS

Data Element	Definitions
Total costs	The sum of operating costs, depreciation/amortisation and cost of capital related to providing continental and oceanic ATC/ATFM services. Meteorological costs and EUROCONTROL costs (if applicable) are not included.
Total employment cost for ATCOs in operations	Total employment costs (staff costs) including gross wages and salaries, payments for overtime and other bonuses, employer contribution to social security scheme and taxes, pension contributions and other benefits for "ATCOs in operations." This should exclude: pension contributions paid by the employee (unless included within employment costs), mission related expenditures, including travel expenditures and training fees, as these should be considered operating costs.
Other costs	Total operating costs minus ATCO in operation employment costs.
IFR flight hours	Total number of controlled IFR flight hours in continental and oceanic airspace.
ATCO in operation hours	Total annual working hours for ATCOs in operations – including breaks and overtime. Holiday is not included. Calculated as average annual working hours for ATCO in operations times the number of total number of ATCOs in operations.
Number of ATCOs in operations (expressed in FTE)	<p>The number (expressed in FTE) of ATCOs who are participating in an activity that is either directly related to the control of traffic or is a necessary requirement for ATCOs to be able to control traffic. Such activities include manning a position, refresher training and supervising on the job trainee controllers, but do not include participating in special projects, teaching at a training academy, or providing instruction in a simulator. Includes first-line supervisors. Does not include on-the-job training. An ATCO in operations should hold a valid ATCO license.</p> <p>The number (expressed in FTE) should be calculated as an average based on the FTE number at the start of the year and the FTE number at the end of the year.</p> <p>Definition of Full Time Equivalent (FTE) (Source: EUROCONTROL Specification for Information Disclosure – Version 2, October 2001): The equivalent of a single person carrying out a particular job or activity working on a full time basis during a year. A part time ATCO working half the hours of a normal ATCO, should be counted as a 0.5FTE. A full time ATCO working two thirds of his time on duty in OPS and one third of his time on teaching at a training academy would be counted as a 0.67 FTE ATCO in OPS and a 0.33 FTE ATCO on other duties..</p>
Number of Frontline Service Support Staff (expressed in FTE)	Sum of ATC assistants, ops support, OPS support (non-ATCOs), technical support staff for operational maintenance monitoring and control, technical support staff for planning and development, ATCOs on other duties, and outsourced frontline service support.

ANNEX 3: KEY PERFORMANCE INDICATORS

The detailed metrics for determining the cost efficiency and productivity of continental and oceanic air navigation services are set out in Figure 35. These performance indicators are derived from the CANSO ANS Performance Framework.

DETERMINING PERFORMANCE METRICS

The CANSO ANS Performance Framework was established to create common performance indicators for global ANS data. Based on a tiered structure, the framework was developed in 2014 by the CANSO Global Benchmarking Workgroup (GBWG). It aims to demonstrate the drivers of cost efficiency.

Level 1

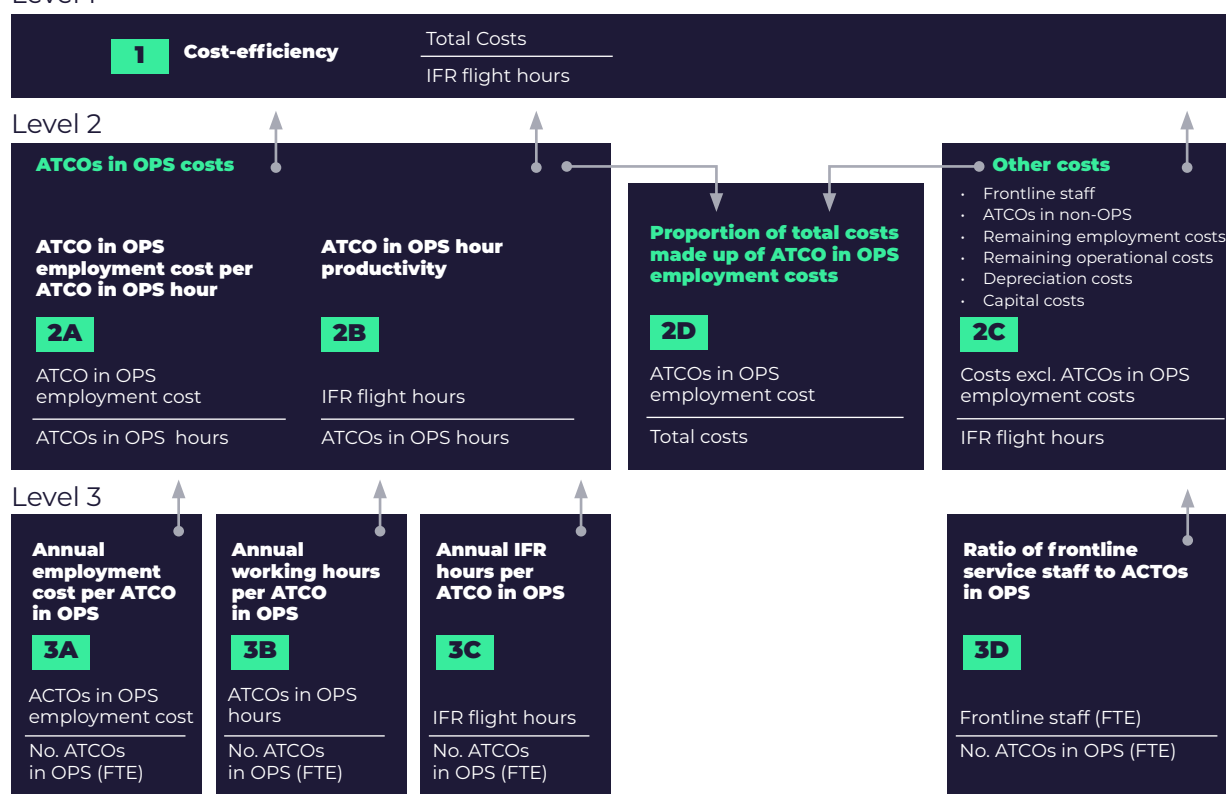


Figure 35 – CANSO ANS performance framework

Over the years, the GBWG has worked to identify alternative KPIs to investigate the drivers of the KPIs in the framework, in particular KPI 2C. In 2020, KPI 3D was added to framework to better understand the proportion of 'frontline service support staff' to ATCO in OPS in an ANSP.

It is important to note the dependence of the higher tier metrics on the lower tier. This can be established as follows:

$$\text{KPI 1} = \frac{\text{KPI 2A}}{\text{KPI 2B}} + \text{KPI 2C}$$

$$\text{KPI 2A} = \frac{\text{KPI 3A}}{\text{KPI 3B}}$$

$$\text{KPI 2B} = \frac{\text{KPI 3C}}{\text{KPI 3B}}$$

$$\text{KPI 2D} = \frac{\left(\frac{\text{KPI 2A}}{\text{KPI 2B}} \right)}{\text{KPI 1}} + \frac{\text{KPI 1} - \text{KPI 2C}}{\text{KPI 1}}$$

OVERVIEW OF AVERAGE PERFORMANCE

The average performance for all the CANSO Key Performance Indicators (KPIs), when comparing 2019 and 2020 ANSP continental (C) and oceanic (O) data, are detailed in the summary table below.

KPI		CONTINENTAL / OCEANIC	2019 AVERAGE	2020 AVERAGE	YEAR-ON-YEAR CHANGE
Continental and Oceanic Cost Efficiency and Productivity Performance Indicators					
1	Cost per IFR flight hour	C	USD 538	USD 1,110	106%
		O	USD 96	USD 177	83%
2A	ATCO in OPS employment cost per ATCO in OPS hour	C	USD 106	USD 115	9%
		O	USD 121	USD 135	11%
2B	ATCO in OPS hour productivity	C	0.75	0.43	-43%
		O	4.39	3.42	-22%
2C	Cost excluding ATCOs in OPS employment costs per IFR flight hours	C	USD 392	USD 794	103%
		O	USD 62	USD 110	78%
2D	Employment costs of ATCOs in OPS as a percentage of Total costs	C	29%	29%	0%
		O	39%	38%	-3%
3A	Annual employment cost per ATCO in OPS	C	USD 148,369	USD 142,390	-4%
		O	USD 185,957	USD 175,805	-5%
3B	Annual Working hours per ATCO in OPS	C	1,489	1,343	-10%
		O	1,535	1,290	-16%
3C	Annual IFR hours per ATCO in OPS	C	1,112	563	-49%
		O	6,850	4,284	-37%
3D	Ratio of frontline service staff to ATCO in OPS	C	1.18	1.24	5%
		O	0.96	0.86	-11%
Joint Continental and Oceanic Cost Efficiency Performance Indicators					
CO1	Cost per IFR flight hour	C + O	USD 532	USD 1,105	108%
CO2D	Employment costs of ATCOs in OPS as a percentage of Total costs	C + O	29%	29%	0%

Table 5 – Average performance for all KPIs in 2019 and 2020

ANNEX 4: CONTEXTUAL DATA

Please note contextual data is only included for CANSO GBWG submitters.

ANSP: AIRPORTS AUTHORITY OF INDIA (AAI)

Does your ANSP have stated objectives? If so, what are they?	TO BE THE PRE-EMINENT ANSP WITH GLOBAL RECOGNITION 2. TO ADOPT STATE OF THE ART TECHNOLOGY TO DRIVE SAFE NAVIGATION IN INDIAN AIRSPACE
In your opinion what are the main drivers or issues for performance within your region?	ATM TRAFFIC GROWTH
What are the main initiatives you are undertaking to improve your performance?	SPACE BASED ADS-B
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	COVID-19 PANDEMIC

Legal status:

A government entity empowered to manage and use the revenues it generates through charges for the services it provides.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	3,570,000	6,400,000	
Percentage surveillance coverage at 30,000ft – primary radar	100%	0%	
Percentage surveillance coverage at 30,000ft – secondary radar	100%	0%	
Percentage surveillance coverage at 30,000ft – ADS-B	100%	0%	
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%	100%	
Percentage surveillance coverage at 30,000ft – ADS-C	0%	100%	
Number of FIRs	1	3	

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	0	0	
Number of co-located ACC and approach facilities	0	0	
Number of stand-alone approach facilities	0	0	
Number of co-located approach and tower facilities	76	0	
Number of stand-alone towers	5	0	
Number of co-located ACC, approach and tower facilities	16	0	

Does your ANSP have stated objectives? If so, what are they?	We have 10 strategic objectives supporting our vision of "a sustainable quality excellent air navigation service provider."
In your opinion what are the main drivers or issues for performance within your region?	Traffic reduction due to COVID-19 pandemic.
What are the main initiatives you are undertaking to improve your performance?	Cost reduction.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	COVID-19 caused Thailand to temporary close its borders as well as temporary stop all domestic flights in April 2020. Domestic flights resumed operations in May 2020, while international flights resumed as semi commercial flights in November.

Legal status:

A company established as a public-private partnership that remains part-owned by the government and provides services on behalf of the government.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	777,760		
Percentage surveillance coverage at 30,000ft – primary radar	5%		
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B	0%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		
Percentage surveillance coverage at 30,000ft – ADS-C	0%		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Number of FIRs	1		
Facilities			
Number of ACC facilities	1		
Number of co-located ACC and approach facilities	0		
Number of stand-alone approach facilities	1		
Number of co-located approach and tower facilities	6		
Number of stand-alone towers	14		
Number of co-located ACC, approach and tower facilities	0		

<p>Does your ANSP have stated objectives? If so, what are they?</p>	<p>Our stated purpose is "CONNECTING PEOPLE WITH THEIR WORLD SAFELY" – We provide safe, secure, efficient and environmentally responsible services to the aviation industry and community. As defined in the Air Services Act 1995, our purpose is to:</p> <ul style="list-style-type: none"> • Provide facilities and services for the safety, regularity and efficiency of air navigation within Australian-administered airspace. This includes providing air traffic services, aviation rescue firefighting services, aeronautical information, radio navigation and telecommunications services • Promote and foster civil aviation in Australia and overseas.
<p>In your opinion what are the main drivers or issues for performance within your region?</p>	
<p>What are the main initiatives you are undertaking to improve your performance?</p>	<p>Our four strategic pillars — Service Excellence, Service Innovation, Industry Leadership and Organisational Agility — are the foundation of our value proposition to our customers, community and industry. Below are the service delivery and capability initiatives central to our performance delivered in 2020.</p> <p>Industry Leadership</p> <ul style="list-style-type: none"> • Fostering and Promoting Aviation – 2% price reduction from 1 July 2019 • Airspace Modernisation Program – increase and nationally standardise upper en-route Class C and Class E controlled airspace <p>Service Innovation</p> <ul style="list-style-type: none"> • Digital Aerodromes Services – completed trial of contingency operation and national deployment roadmap • Unmanned Aerial Vehicles (UAV) Integration and Management Services – completed planned pilot trials <p>Service Excellence</p> <ul style="list-style-type: none"> • OneSKY Program – met planned deliverables in system design and facility upgrade • Support Airport Development – Sunshine Coast runway program and Brisbane new parallel runway infrastructure program completed <p>Organisational Agility – we have delivered a range of initiative including improving digital information capability, cyber resilience and continuous implementation of people capability and engagement program.</p>
<p>Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic</p>	<p>The onset of the COVID-19 pandemic in Q3 of FY2020, and the resulting decrease in air traffic as a result of efforts to contain the spread of the virus, has substantially disrupted the aviation ecosystem. The disruption to air travel resulted in Airservices revenue falling by 24 per cent in FY2019–20. The initial wave of the COVID-19 pandemic in the April–June quarter resulted in an 80 per cent decrease in revenue year-on-year. Overall, traffic for 2019–20 decreased by 13.5 per cent year-on-year, with the greatest impact in Q4, when customer traffic reduced by 58.5 per cent.</p>

Legal status:

A government entity empowered to manage and use the revenues it generates through charges for the services it provides.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	7,692,000	44,008,000	
Percentage surveillance coverage at 30,000ft – primary radar	30%	0%	
Percentage surveillance coverage at 30,000ft – secondary radar	39%	5%	
Percentage surveillance coverage at 30,000ft – ADS-B	98%	11%	
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%	0%	
Percentage surveillance coverage at 30,000ft – ADS-C	100%	100%	
Number of FIRs	2	2	
Facilities			
Number of ACC facilities	2	2	
Number of co-located ACC and approach facilities	2	0	
Number of stand-alone approach facilities	2	0	
Number of co-located approach and tower facilities	12	0	
Number of stand-alone towers	15	0	
Number of co-located ACC, approach and tower facilities	2	0	

Does your ANSP have stated objectives? If so, what are they?	Safety. Creating flexible and responsive operations. Focus on sustainability. Implementing new ATM platform. Integrated reporting. Focus on core services (ATS).
In your opinion what are the main drivers or issues for performance within your region?	Responsiveness to customer demand especially with fluctuation in traffic levels as COVID-19 impacts recovery.
What are the main initiatives you are undertaking to improve your performance?	During this year a number of initiatives to improve performance were put on hold whilst we focused on the cost reduction and core service delivery.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	Significant drop in traffic (and revenue) during the year due to COVID-19, particularly in Oceanic operations which has not yet shown signs of much recovery.

Legal status:

A corporatised entity wholly owned by the government with special status (not governed by normal commercial law but by a specific founding law or statute).

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	863,100	28,790,000	
Percentage surveillance coverage at 30,000ft – primary radar	40%	0%	
Percentage surveillance coverage at 30,000ft – secondary radar	100%	0%	
Percentage surveillance coverage at 30,000ft – ADS-B	90%	5%	
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%	0%	
Percentage surveillance coverage at 30,000ft – ADS-C	100%	100%	
Number of FIRs	1	1	

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	0	1	
Number of co-located ACC and approach facilities	1	0	
Number of stand-alone approach facilities	0	0	
Number of co-located approach and tower facilities	6	0	
Number of stand-alone towers	11	0	
Number of co-located ACC, approach and tower facilities	0	0	

ANSP: ADMINISTRATION DE LA NAVIGATION AÉRIENNE (ANA)

Does your ANSP have stated objectives? If so, what are they?	Yes, ST01: Provide en-route and terminal ANS.
In your opinion what are the main drivers or issues for performance within your region?	In 2020, the COVID-19 crises led to a significant drop in traffic which means a loss of 41% of income.
What are the main initiatives you are undertaking to improve your performance?	We are renewing our technical infrastructure to offer state-of-the-art service and also adding working positions in both TWR and APP in the coming years to more efficiently handle the traffic.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	No, they improved or remained the same.

Legal status:

A government department or authority that is subject to government accounting and treasury rules, and staff are employed under civil service pay and conditions.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	4,000		
Percentage surveillance coverage at 30,000ft – primary radar	0%		
Percentage surveillance coverage at 30,000ft – secondary radar	0%		
Percentage surveillance coverage at 30,000ft – ADS-B	0%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		
Percentage surveillance coverage at 30,000ft – ADS-C	0%		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Number of FIRs	1		
Facilities			
Number of ACC facilities	0		
Number of co-located ACC and approach facilities	0		
Number of stand-alone approach facilities	1		
Number of co-located approach and tower facilities	1		
Number of stand-alone towers	0		
Number of co-located ACC, approach and tower facilities	0		

ANSP: AIR TRAFFIC & NAVIGATION SERVICES (SOUTH AFRICA)

Does your ANSP have stated objectives? If so, what are they?	To provide safe, expeditious and efficient Air Traffic Management solutions and associated services.
In your opinion what are the main drivers or issues for performance within your region?	Aircraft Equipage that is behind by African operators, economic and political issues.
What are the main initiatives you are undertaking to improve your performance?	Implementation of ASBU Blocks, Implementation of ADS-B coverage, Adopting TopSky enhancements, Paperless Flight Progress Strips.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	None.

Legal status:

A government entity empowered to manage and use the revenues it generates through charges for the services it provides.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	9,279,080	12,720,920	
Percentage surveillance coverage at 30,000ft – primary radar	92%	0%	
Percentage surveillance coverage at 30,000ft – secondary radar	98%	0%	
Percentage surveillance coverage at 30,000ft – ADS-B	0%	0%	
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%	0%	
Percentage surveillance coverage at 30,000ft – ADS-C	0%	95%	
Number of FIRs	2	1	

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	0	0	
Number of co-located ACC and approach facilities	0	0	
Number of stand-alone approach facilities	0	0	
Number of co-located approach and tower facilities	9	0	
Number of stand-alone towers	9	0	
Number of co-located ACC, approach and tower facilities	2	0	

Does your ANSP have stated objectives? If so, what are they?	<p>CAAS' mission is to grow a safe, vibrant air hub and civil aviation system, making a key contribution to Singapore's success. CAAS does so via six areas of focus, namely:</p> <ul style="list-style-type: none"> • Growing Singapore as a Global Air Hub • Ensuring Safe and Efficient Air Traffic Flows • Upholding a Safe Aviation Environment • Developing the Industry • Contributing to International Aviation • Contingency Planning & Crisis Management
In your opinion what are the main drivers or issues for performance within your region?	COVID-19 has posed a huge disruption to our performance and there is a need to strengthen our resilience while making continuous improvements to build a safe, efficient and sustainable air hub as we emerge from the COVID-19 pandemic.
What are the main initiatives you are undertaking to improve your performance?	<ul style="list-style-type: none"> • ATM modernisation to handle future traffic growth and improve safety and efficiency • Develop the Sustainable Air Hub Blueprint to identify practical and tangible pathways to build a sustainable air hub
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	COVID-19 has resulted in a significant decline in IFR flight hours in financial year 2020 which in turn impacted the KPIs.

Legal status:

A government entity empowered to manage and use the revenues it generates through charges for the services it provides.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	840,000		
Percentage surveillance coverage at 30,000ft – primary radar	35%		
Percentage surveillance coverage at 30,000ft – secondary radar	35%		
Percentage surveillance coverage at 30,000ft – ADS-B	95%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	100%		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Percentage surveillance coverage at 30,000ft – ADS-C	100%		
Number of FIRs	1		
Facilities			
Number of ACC facilities	1		
Number of co-located ACC and approach facilities	0		
Number of stand-alone approach facilities	1		
Number of co-located approach and tower facilities	0		
Number of stand-alone towers	3		
Number of co-located ACC, approach and tower facilities	0		

ANSP: LATVIJAS GAISA SATIKSME (LGS)

Does your ANSP have stated objectives? If so, what are they?	Yes. LGS performs under national performance plan, therefore, the objectives are aligned.
In your opinion what are the main drivers or issues for performance within your region?	High volatility of traffic, dependency on Russian segment and instability on the Eastern boarder of EU. Liquidity pressure to postpone crucial, safety related investments.
What are the main initiatives you are undertaking to improve your performance?	LGS will continue to balance the demand and supply.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	Traffic loss due to COVID-19 pandemic.

Legal status:

A corporatised entity wholly owned by the government with special status (not governed by normal commercial law but by a specific founding law or statute).

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	95,900		
Percentage surveillance coverage at 30,000ft – primary radar	35%		
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B	100%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		
Percentage surveillance coverage at 30,000ft – ADS-C	0%		
Number of FIRs	1		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	0		
Number of co-located ACC and approach facilities	1		
Number of stand-alone approach facilities	0		
Number of co-located approach and tower facilities	0		
Number of stand-alone towers	1		
Number of co-located ACC, approach and tower facilities	0		

ANSP: LENNULIIKLUSTEENINDUSE AKTSIASELTS (EANS)

Does your ANSP have stated objectives? If so, what are they?	
In your opinion what are the main drivers or issues for performance within your region?	
What are the main initiatives you are undertaking to improve your performance?	
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	

Legal status:

A corporatised entity wholly owned by the government, governed by normal commercial law.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	77,400		
Percentage surveillance coverage at 30,000ft – primary radar	0%		
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B	100%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		
Percentage surveillance coverage at 30,000ft – ADS-C	0%		
Number of FIRs	1		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	0		
Number of co-located ACC and approach facilities	0		
Number of stand-alone approach facilities	0		
Number of co-located approach and tower facilities	0		
Number of stand-alone towers	0		
Number of co-located ACC, approach and tower facilities	1		

ANSP: KENYA CIVIL AVIATION AUTHORITY (KCAA)

Does your ANSP have stated objectives? If so, what are they?	This are captured in the Authority Strategic Plan and the Airspace Masterplan 2015-2030.
In your opinion what are the main drivers or issues for performance within your region?	Safety and efficiency.
What are the main initiatives you are undertaking to improve your performance?	KCAA has developed KPIs for measurement of key performance areas.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	Suspension of passenger flights due COVID-19.

Legal status:

A government entity empowered to manage and use the revenues it generates through charges for the services it provides.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	77,052		
Percentage surveillance coverage at 30,000ft – primary radar	40%		
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B	100%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		The system has not been officially commissioned to operate at the ATC Control Positions
Percentage surveillance coverage at 30,000ft – ADS-C	100%		ADS-C technically covers the entire airspace but only available to aircraft that are able to logon, although controller-pilot voice communication is the primary source of communication.
Number of FIRs	1		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	1		
Number of co-located ACC and approach facilities	1		
Number of stand-alone approach facilities	0		
Number of co-located approach and tower facilities	3		
Number of stand-alone towers	5		
Number of co-located ACC, approach and tower facilities	1		

ANSP: DIRECTION DES SERVICES DE LA NAVIGATION AÉRIENNE (DSNA)

Does your ANSP have stated objectives? If so, what are they?	
In your opinion what are the main drivers or issues for performance within your region?	
What are the main initiatives you are undertaking to improve your performance?	
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	

Legal status:

A government entity empowered to manage and use the revenues it generates through charges for the services it provides.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	1,010,000	15,437,214	
Percentage surveillance coverage at 30,000ft – primary radar			
Percentage surveillance coverage at 30,000ft – secondary radar			
Percentage surveillance coverage at 30,000ft – ADS-B			
Percentage surveillance coverage at 30,000ft – Space based ADS-B			
Percentage surveillance coverage at 30,000ft – ADS-C			
Number of FIRs	5	2	
Facilities			
Number of ACC facilities	5	0	
Number of co-located ACC and approach facilities	0	0	
Number of stand-alone approach facilities	0	0	
Number of co-located approach and tower facilities	12	6	
Number of stand-alone towers	74	4	
Number of co-located ACC, approach and tower facilities	0	2	

ANSP: EMPRESA ARGENTINA DE NAVEGACIÓN AÉREA (EANA)

Does your ANSP have stated objectives? If so, what are they?	We have implemented an strategic plan, that includes key objectives. Those imply strengthening of our human resources, granting maximum security standards, and investing on technological infrastructure.
In your opinion what are the main drivers or issues for performance within your region?	Invest in technological infrastructure, such as PBN procedures.
What are the main initiatives you are undertaking to improve your performance?	Investment in new technological infrastructure, such as new ILS systems, radars and VOR. Besides that, we plan to digitalise most of our procedures.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	Mainly the pandemic.

Legal status:

A corporatised entity wholly owned by the government with special status (not governed by normal commercial law but by a specific founding law or statute).

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	16,300,000		
Percentage surveillance coverage at 30,000ft – primary radar			
Percentage surveillance coverage at 30,000ft – secondary radar			
Percentage surveillance coverage at 30,000ft – ADS-B	87%	2%	
Percentage surveillance coverage at 30,000ft – Space based ADS-B			
Percentage surveillance coverage at 30,000ft – ADS-C	87%	100%	
Number of FIRs	5		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	5		
Number of co-located ACC and approach facilities	0		
Number of stand-alone approach facilities	0		
Number of co-located approach and tower facilities	54		
Number of stand-alone towers	0		
Number of co-located ACC, approach and tower facilities	0		

Does your ANSP have stated objectives? If so, what are they?	Spain (and, therefore, ENAIRE) is subject to regulated performance objectives through the Performance framework (Reg 317/2019; Reg 2020/1627; Decision 2021/891), PRB monitoring dashboards, etc). Additionally ENAIRE establishes, in its strategic plan other objectives for priority areas.
In your opinion what are the main drivers or issues for performance within your region?	Europe is strongly driven by the SES Performance and Charging scheme regulation in the EU, and Eurocontrol vision at wider level (ECAC). 2020 was the first year of the RP3, therefore subject to performance plans that were stopped because of the pandemic strike. Previous plans were dimensioned for a traffic increase, therefore there was a need of revision of EU and local targets, as well as ensuring that ANSP costs were recovered while minimising the impact for users (See Reg 2020/1627).
What are the main initiatives you are undertaking to improve your performance?	ENAIRE establishes its priorities and main initiatives in their Strategic Plan. Digitalisation, airspace restructuration and an ambitious investment plan are at the core of ENAIRE's expectations to improve future performance.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	As in the rest of the world the COVID-19 pandemic was very disruptive. The traffic drop (around -70% of 2019 levels) affected the economic indicators due to dramatic reduction of income. At the beginning of the pandemic there was a need to reorganise rostering so that we could ensure that the potential for cross-infection was minimised within operational staff, therefore, there were several days of delay increase, although for most of the year delays were cuasi-zero. Additional health protection measures (adaptation of working spaces, purchase of diagnose tests, masks, disinfection protocols, etc) were needed. purchase of laptops to allow remote working was also necessary.

Legal status:

A government entity empowered to manage and use the revenues it generates through charges for the services it provides.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	2,190,000.0		
Percentage surveillance coverage at 30,000ft – primary radar			
Percentage surveillance coverage at 30,000ft – secondary radar			
Percentage surveillance coverage at 30,000ft – ADS-B			

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Percentage surveillance coverage at 30,000ft – Space based ADS-B			
Percentage surveillance coverage at 30,000ft – ADS-C			
Number of FIRs	3		
Facilities			
Number of ACC facilities	5		
Number of co-located ACC and approach facilities	0		
Number of stand-alone approach facilities	3		
Number of co-located approach and tower facilities	14		
Number of stand-alone towers	7		
Number of co-located ACC, approach and tower facilities	0		

ANSP: FEDERAL AVIATION ADMINISTRATION – AIR TRAFFIC ORGANIZATION

<p>Does your ANSP have stated objectives? If so, what are they?</p>	<p>FAA Mission Our continuing mission is to provide the safest, most efficient aerospace system in the world.</p> <p>FAA Vision We strive to reach the next level of safety and efficiency and to demonstrate global leadership in how we safely integrate new users and technologies into our aviation system. We are accountable to the American public and our aviation stakeholders.</p> <p>FAA Values Safety is our passion. We work so all air and space travelers arrive safely at their destinations. Excellence is our promise. We seek results that embody professionalism, transparency and accountability. Integrity is our touchstone. We perform our duties honestly, with moral soundness, and with the highest level of ethics. People are our strength. Our success depends on the respect, diversity, collaboration, and commitment of our workforce. Innovation is our signature. We foster creativity and vision to provide solutions beyond today's boundaries.</p>
<p>In your opinion what are the main drivers or issues for performance within your region?</p>	
<p>What are the main initiatives you are undertaking to improve your performance?</p>	
<p>Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic</p>	

Legal status:

A government department or authority that is subject to government accounting and treasury rules, and staff are employed under civil service pay and conditions.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	14,832,411	60,628,411	
Percentage surveillance coverage at 30,000ft – primary radar			
Percentage surveillance coverage at 30,000ft – secondary radar			
Percentage surveillance coverage at 30,000ft – ADS-B			
Percentage surveillance coverage at 30,000ft – Space based ADS-B			
Percentage surveillance coverage at 30,000ft – ADS-C			
Number of FIRs	21	5	
Facilities			
Number of ACC facilities	21	3	
Number of co-located ACC and approach facilities	3	2	
Number of stand-alone approach facilities	25		
Number of co-located approach and tower facilities	132		
Number of stand-alone towers	131		
Number of co-located ACC, approach and tower facilities	1		

Does your ANSP have stated objectives? If so, what are they?	Try to operate effectively during the pandemic and minimise losses during the years of the crises.
In your opinion what are the main drivers or issues for performance within your region?	The main driver of the European performance is the performance scheme.
What are the main initiatives you are undertaking to improve your performance?	The ANSPs have to bear cost and traffic risk however they do not have influence on traffic. Having incentives on the level of delays as well, HungaroControl is interested in the further development of capacities (technological investments, airspace management procedures, training).
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	COVID-19.

Legal status:

A corporatised entity wholly owned by the government with special status (not governed by normal commercial law but by a specific founding law or statute).

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	104,000		
Percentage surveillance coverage at 30,000ft – primary radar	100%		
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B	100%		(not used operationally)
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		
Percentage surveillance coverage at 30,000ft – ADS-C	0%		
Number of FIRs	2		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	0		
Number of co-located ACC and approach facilities	1		
Number of stand-alone approach facilities	0		
Number of co-located approach and tower facilities	0		
Number of stand-alone towers	1		
Number of co-located ACC, approach and tower facilities	0		

Does your ANSP have stated objectives? If so, what are they?	Maintain safety, provide efficient and cost effective services.
In your opinion what are the main drivers or issues for performance within your region?	We are completely reliant on stable traffic flows, disruptions such as those due to COVID-19 show the limits of flexibility available to ANSPs.
What are the main initiatives you are undertaking to improve your performance?	No such initiatives are available for the moment.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	COVID-19 had a tremendous impact on all performance metrics, data from 2020 is effectively useless as a comparative metric except when used to gauge effects of the pandemic on our industry.

Legal status:

A corporatised entity wholly owned by the government with special status (not governed by normal commercial law but by a specific founding law or statute).

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	103,000	5,400,000	
Percentage surveillance coverage at 30,000ft – primary radar	100%		
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B	100%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	100%		
Percentage surveillance coverage at 30,000ft – ADS-C			
Number of FIRs	1	2	

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	1	1	
Number of co-located ACC and approach facilities	1	1	
Number of stand-alone approach facilities	0	0	
Number of co-located approach and tower facilities	1	0	
Number of stand-alone towers	2	0	
Number of co-located ACC, approach and tower facilities	0	0	

ANSP: JAPAN AIR NAVIGATION SERVICE (JANS)

Does your ANSP have stated objectives? If so, what are they?	
In your opinion what are the main drivers or issues for performance within your region?	
What are the main initiatives you are undertaking to improve your performance?	
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	

Legal status:

A government department or authority that is subject to government accounting and treasury rules, and staff are employed under civil service pay and conditions.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	8,400,000		
Percentage surveillance coverage at 30,000ft – primary radar	100%		
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B	0%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		
Percentage surveillance coverage at 30,000ft – ADS-C	100%		
Number of FIRs	1		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	4		
Number of co-located ACC and approach facilities	0		
Number of stand-alone approach facilities	0		
Number of co-located approach and tower facilities	13		
Number of stand-alone towers	20		
Number of co-located ACC, approach and tower facilities	0		

ANSP: DEVLET HAVA MEYDANLARI İŞLETMESİ GENEL MÜDÜRLÜĞÜ (DHMI)

Does your ANSP have stated objectives? If so, what are they?	
In your opinion what are the main drivers or issues for performance within your region?	
What are the main initiatives you are undertaking to improve your performance?	
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	

Legal status:

A government entity empowered to manage and use the revenues it generates through charges for the services it provides.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	982,000		
Percentage surveillance coverage at 30,000ft – primary radar	25%		
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B	0%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		
Percentage surveillance coverage at 30,000ft – ADS-C	0%		
Number of FIRs	2		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	2		
Number of co-located ACC and approach facilities	3		
Number of stand-alone approach facilities	0		
Number of co-located approach and tower facilities	47		
Number of stand-alone towers	0		
Number of co-located ACC, approach and tower facilities	0		

Does your ANSP have stated objectives? If so, what are they?	
In your opinion what are the main drivers or issues for performance within your region?	
What are the main initiatives you are undertaking to improve your performance?	
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	

Legal status:

A corporatised entity with special status, not governed by normal commercial law but by a specific founding law or statute (and wholly owned by the government).

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental			
Percentage surveillance coverage at 30,000ft – primary radar			
Percentage surveillance coverage at 30,000ft – secondary radar			
Percentage surveillance coverage at 30,000ft – ADS-B			
Percentage surveillance coverage at 30,000ft – Space based ADS-B			
Percentage surveillance coverage at 30,000ft – ADS-C			
Number of FIRs			

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities			
Number of co-located ACC and approach facilities			
Number of stand-alone approach facilities			
Number of co-located approach and tower facilities			
Number of stand-alone towers			
Number of co-located ACC, approach and tower facilities			

Does your ANSP have stated objectives? If so, what are they?	Yes. We have a 5-year Business Plan with objectives and targets steaming from EU regulation (EU Reg. 2019/317) for Capacity, Environment, Cost-Efficiency and Safety.
In your opinion what are the main drivers or issues for performance within your region?	SES Regulations and specifically Performance scheme works as the main driver to improve efficiency as well as traffic demand and customer satisfaction. On the other hand, economic regulation is not oriented to encourage more and better efficiency by ANSPs. Additionally, SES regulation wasn't capable to address such extreme situations as the ones that we've experienced resulting from the COVID-19 crisis. Future regulation should be more financially resilient allowing for instances some kind of rescue fund, that could offer some liquidity in such extreme situations.
What are the main initiatives you are undertaking to improve your performance?	Implement new ATM systems to respond to the increase digitalisation of the sector, as well the CNS infrastructure, to keep/ improve our capacity, safety and productivity indicators.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	Along 2020 we had a traffic drop of 59% in 2020, which resulted in a decrease in service units of 62% against 2019 figures.

Legal status:

A corporatised entity wholly owned by the government with special status (not governed by normal commercial law but by a specific founding law or statute).

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	671,000	5,180,000	
Percentage surveillance coverage at 30,000ft – primary radar	0%	0%	
Percentage surveillance coverage at 30,000ft – secondary radar	86%	15%	
Percentage surveillance coverage at 30,000ft – ADS-B	91%	26%	
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%	0%	
Percentage surveillance coverage at 30,000ft – ADS-C	0%	100%	

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Number of FIRs	1	1	
Facilities			
Number of ACC facilities	1	1	
Number of co-located ACC and approach facilities	1	0	
Number of stand-alone approach facilities	0	0	
Number of co-located approach and tower facilities	7	0	
Number of stand-alone towers	3	0	
Number of co-located ACC, approach and tower facilities	0	0	

Does your ANSP have stated objectives? If so, what are they?	
In your opinion what are the main drivers or issues for performance within your region?	
What are the main initiatives you are undertaking to improve your performance?	
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	

Legal status:

-

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	75,300		
Percentage surveillance coverage at 30,000ft – primary radar			
Percentage surveillance coverage at 30,000ft – secondary radar			
Percentage surveillance coverage at 30,000ft – ADS-B			
Percentage surveillance coverage at 30,000ft – Space based ADS-B			
Percentage surveillance coverage at 30,000ft – ADS-C			
Number of FIRs	1		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	1		
Number of co-located ACC and approach facilities	0		
Number of stand-alone approach facilities	0		
Number of co-located approach and tower facilities	3		
Number of stand-alone towers	1		
Number of co-located ACC, approach and tower facilities	0		

ANSP: POLISH AIR NAVIGATION SERVICES AGENCY (PANSA)

Does your ANSP have stated objectives? If so, what are they?	Objectives related to the Performance Plan/SES Regulations and 4 Key Performance Areas: Safety, Environment, Capacity, Cost-Efficiency.
In your opinion what are the main drivers or issues for performance within your region?	SES Regulations, Performance Plans requirements, Performance and Charging Scheme regulations; Changes in traffic routes due to the Ukrainian situation (partial closure of the Ukrainian airspace – Poland lost a lot of overflights including “heavy traffic”).
What are the main initiatives you are undertaking to improve your performance?	Airspace modernisation including TMA; Changes in the sectorisation of airspace; Shortening the flight routes; Reducing CO2 emissions; Implementation of Traffic Complexity Tool and improving the competitiveness offered by the PANSA for users of Polish airspace.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	Impact of COVID-19 pandemic; Revision of the Performance Plan for third reference period (2020-2024) in particular in terms of cost effectiveness. Following partial closure of the Ukrainian airspace, Poland lost a lot of overflights including “heavy traffic” (A380, B747, B777) going from North/West to the South/East, crossing southern half of Warsaw FIR.

Legal status:

A state legal entity empowered to manage and use the revenues it generates through charges for the services it provides.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	334,000		
Percentage surveillance coverage at 30,000ft – primary radar	0%		
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B	0%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		
Percentage surveillance coverage at 30,000ft – ADS-C	0%		
Number of FIRs	1		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	1		
Number of co-located ACC and approach facilities	1		
Number of stand-alone approach facilities	3		
Number of co-located approach and tower facilities	0		
Number of stand-alone towers	15		
Number of co-located ACC, approach and tower facilities	0		

ANSP: SAUDI AIR NAVIGATION SERVICES (SANS)

Does your ANSP have stated objectives? If so, what are they?	There are 14 objectives under 5 strategic pillars in SANS. The strategic pillars are Safe Operation, Efficient Operation, Human Focus, Financial Effectiveness, and Strategic Partnership.
In your opinion what are the main drivers or issues for performance within your region?	Maintaining & ensuring safe air space while optimising operations Be a regional leader in all aspects in ANSP To be aligned with National Vision 2030
What are the main initiatives you are undertaking to improve your performance?	SANS has several Initiatives that would improve performance in safety, performance, people, finance, and strategic partnership. Some of these initiatives involves in upgrading the ATM system, re-designing Saudi FIR, uplifting working environment, and increasing overall SANS maturity in Safety and performance.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	The reduced amount of traffic that was caused by COVID-19 pandemic.

Legal status:

A corporatised entity wholly owned by the government with special status (not governed by normal commercial law but by a specific founding law or statute).

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	2,089,797		
Percentage surveillance coverage at 30,000ft – primary radar	15%		
Percentage surveillance coverage at 30,000ft – secondary radar	95%		
Percentage surveillance coverage at 30,000ft – ADS-B	0%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		
Percentage surveillance coverage at 30,000ft – ADS-C	0%		
Number of FIRs	1		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities			
Number of co-located ACC and approach facilities	2		Located in Jeddah and Riyadh
Number of stand-alone approach facilities	4		Located in Abha, Dammam, Taif, and Tabuk
Number of co-located approach and tower facilities			
Number of stand-alone towers	17		Located in Nejarn, Abha, Gizan, Bisha, Baha, Taif, Jeddah, Madinah, Yanbu, Wajh (Mobile Tower), Neom, Tabuk,, Hail, Qassim, Dammam, Alehsa, and Alriyadh
Number of co-located ACC, approach and tower facilities			

Does your ANSP have stated objectives? If so, what are they?	
In your opinion what are the main drivers or issues for performance within your region?	In no-COVID-19 times – capacity.
What are the main initiatives you are undertaking to improve your performance?	Carefully planned capacity (staff, technology) and cost efficiency.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	COVID-19 and no national carrier in terminal.

Legal status:

A corporatised entity wholly owned by the government with special status (not governed by normal commercial law but by a specific founding law or statute)..

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	20,000		
Percentage surveillance coverage at 30,000ft – primary radar	100%		
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B	0%		
Percentage surveillance coverage at 30,000ft – Space based ADS-B	0%		
Percentage surveillance coverage at 30,000ft – ADS-C	0%		
Number of FIRs	1		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	0		
Number of co-located ACC and approach facilities	1		
Number of stand-alone approach facilities	0		
Number of co-located approach and tower facilities	2		
Number of stand-alone towers	2		
Number of co-located ACC, approach and tower facilities	0		

ANSP: SERBIA AND MONTENEGRO AIR TRAFFIC SERVICES AGENCY (SMATSA)

Does your ANSP have stated objectives? If so, what are they?	Yes. SMATSA 5-year Strategic Business Plan contains a set of Strategic Objectives. Those were set in order to improve general performance of the company, but basically performance of services provided. The objectives are focused on infrastructure modernisation / investments and HR performance improvements. Issues and challenges are related to COVID-19 influence on overall business capabilities and financial liquidity.
In your opinion what are the main drivers or issues for performance within your region?	COVID-19.
What are the main initiatives you are undertaking to improve your performance?	The completion of infrastructure modernisation program and at the same time local banks loans in order to overcome financial issues related to COVID-19 influence. At the same time continuation of ATCO and other staff training, and finalisation of on-going projects in the ATM/ CNS domain.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	COVID-19 influence. Traffic demand was as such as traditional performance indicating it could be under question. The low traffic levels and income on the one side, but fixes costs on the other, severely changed possibility to adequately benchmark indicators.

Legal status:

Other

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	99,400		
Percentage surveillance coverage at 30,000ft – primary radar	100%		
Percentage surveillance coverage at 30,000ft – secondary radar			
Percentage surveillance coverage at 30,000ft – ADS-B			
Percentage surveillance coverage at 30,000ft – Space based ADS-B			
Percentage surveillance coverage at 30,000ft – ADS-C			
Number of FIRs	1		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	1		
Number of co-located ACC and approach facilities	1		
Number of stand-alone approach facilities			
Number of co-located approach and tower facilities	7		
Number of stand-alone towers			
Number of co-located ACC, approach and tower facilities			

Does your ANSP have stated objectives? If so, what are they?	M-NAV strategic objectives are stated in the company's Strategic business plan, and are constantly promoted as such. They include: achieving international and national standards in Safety, Quality and Security, optimise airspace capacity, optimise cost effectiveness, comply with associated SES Regulations, Guidelines and SES II, Support national and international environment standards, enhance Human Resources Management, adopt managerial structures to future SES Requirements.
In your opinion what are the main drivers or issues for performance within your region?	Progressive implementation of the objectives stated in the European ATM Master Plan level 3, rapid traffic growth, enhanced regional cooperation and sharing mutual experiences for best practices.
What are the main initiatives you are undertaking to improve your performance?	The new ATM System Project, optimisation of Human Resources and flexible sectorisation on daily basis in order to reduce Europe wide en- route delays.
Were there any factors that impacted your individual ANSP performance in your fiscal year 2020, as shown in the KPIs in this report? For example, exceptional events in the year related to traffic	

Legal status:

A government entity empowered to manage and use the revenues it generates through charges for the services it provides.

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Operational data			
Sq. km. – oceanic and continental	24,900		
Percentage surveillance coverage at 30,000ft – primary radar			
Percentage surveillance coverage at 30,000ft – secondary radar	100%		
Percentage surveillance coverage at 30,000ft – ADS-B			
Percentage surveillance coverage at 30,000ft – Space based ADS-B			
Percentage surveillance coverage at 30,000ft – ADS-C			
Number of FIRs	1		

CONTEXTUAL DATA ELEMENT	CONTINENTAL	OCEANIC	COMMENTS
Facilities			
Number of ACC facilities	0		
Number of co-located ACC and approach facilities	0		
Number of stand-alone approach facilities	0		
Number of co-located approach and tower facilities	1		
Number of stand-alone towers	0		
Number of co-located ACC, approach and tower facilities	1		

ANNEX 5: KPI DATA

Continental

1: CONTINENTAL COST PER IFR HOUR (USD)

Formula: Total costs (USD) / IFR flight hours

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	161.09	85.63%	25.00%
AEROTHAI	678.24	54.64%	15.93%
Airways NZ	519.69	7.18%	8.97%
Albcontrol	895.48	28.17%	5.77%
ANA	2,400.63	208.25%	30.47%
ANS CR	1,149.59	102.27%	19.09%
ANS Finland	1,077.65	89.71%	11.52%
ARMATS	1,681.99	160.65%	18.14%
ATNS	352.68	-0.08%	10.49%
Austro Control	1,360.78	75.90%	14.22%
Avinor (Continental)	790.28	39.70%	14.22%
BULATSA	865.36	98.65%	21.39%
CAAS	1,708.85	290.91%	48.16%
Croatia Control	938.73	140.79%	18.86%
DCAC Cyprus	500.65	136.62%	14.51%
DFS	1,772.26	114.23%	18.66%
DHMI	729.54	153.92%	42.38%
DSNA	1,575.52	135.24%	23.45%
EANA	652.84	266.15%	
EANS	788.40	102.01%	26.81%
ENAIRE	1,265.39	136.27%	20.10%
ENAV	1,499.85	127.58%	18.30%
FAA-ATO	601.98	35.09%	7.38%

ANSP	KPI	2019-2020 AGR	4-year CAGR
HCAA	477.37	71.70%	8.38%
HungaroControl	797.50	109.30%	17.75%
IAA	911.66	116.60%	22.24%
Isavia ANS	419.99	66.45%	28.10%
KCAA	256.33	26.36%	7.65%
LFV	1,350.58	207.47%	32.93%
LGS	649.60	98.98%	17.32%
LPS	1,230.30	87.47%	15.38%
LVNL	3,398.64	113.71%	25.96%
MATS	506.08	82.20%	18.14%
M-NAV	878.59	79.87%	12.46%
MOLDATSA	1,625.37	97.57%	14.90%
MUAC	746.09	155.48%	29.98%
NATS (Continental)	1,410.32	152.68%	24.29%
NAV CANADA	419.98	28.07%	7.77%
NAV Portugal (Continental)	803.50	95.94%	22.40%
NAVIAIR	1,466.25	152.28%	25.97%
Oro Navigacija	704.91	65.97%	6.50%
PANSA	928.91	109.31%	22.05%
ROMATSA	1,210.65	125.47%	22.41%
Sakaeronavigatsia	1,006.64	98.24%	26.99%
skeyes	4,745.70	111.49%	24.80%
Skyguide	2,629.75	141.64%	23.84%
Slovenia Control	1,261.17	104.60%	14.68%
SMATSA	839.08	144.22%	22.78%
UksATSE	1,162.75	25.32%	19.02%

2A: CONTINENTAL ATCOS IN OPS EMPLOYMENT COST PER ATCO IN OPS HOUR (USD)

Formula: ATCOs in OPS employment costs / ATCOs in OPS hours

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	19.51	-18.83%	7.24%
AEROTHAI	47.36	13.84%	10.54%
Airways NZ	91.66	1.10%	1.94%
Albcontrol	30.43	-30.87%	-4.76%
ANA	118.88	13.42%	-3.52%
ANS CR	105.40	-9.61%	-2.58%
ANS Finland	91.98	0.46%	-1.77%
ARMATS	20.03	5.23%	11.40%
ATNS	44.02	11.95%	9.82%
Austro Control	197.18	-5.73%	2.37%
Avinor (Continental)	139.64	-1.16%	12.47%
BULATSA	150.94	33.69%	14.37%
Croatia Control	110.76	5.30%	0.62%
DCAC Cyprus	59.96	-1.44%	2.09%
DFS	280.06	-4.24%	2.21%
DHMI	70.08	49.34%	23.66%
DSNA	119.98	-1.57%	0.97%
EANS	119.92	47.73%	14.49%
ENAIRE	207.61	14.70%	2.79%
ENAV	171.50	18.05%	5.65%
FAA-ATO	157.84	25.86%	6.91%
HCAA	56.47	-16.67%	-0.57%
HungaroControl	92.68	-5.74%	1.09%
IAA	118.27	2.41%	1.35%
Isavia ANS	129.98	12.41%	3.70%
KCAA	21.06	0.83%	-0.35%
LFV	233.92	96.18%	21.06%
LGS	58.95	-13.84%	8.06%
LPS	119.63	-7.21%	0.53%
LVNL	123.89	13.33%	-10.80%
MATS	63.83	-10.30%	9.96%

ANSP	KPI	2019-2020 AGR	4-year CAGR
M-NAV	55.98	-21.05%	1.00%
MOLDATSA	20.88	-18.56%	11.22%
MUAC	394.13	36.64%	12.38%
NATS (Continental)	194.62	33.55%	8.74%
NAV CANADA	95.61	-20.05%	-3.93%
NAV Portugal (Continental)	179.50	2.74%	7.00%
NAVIAIR	131.90	1.15%	2.88%
Oro Navigacija	56.66	-7.44%	1.84%
PANSA	169.51	27.72%	11.87%
ROMATSA	120.68	2.39%	3.59%
Sakaeronavigatsia	18.23	-5.52%	10.84%
skeyes	248.24	33.37%	8.54%
Skyguide	192.49	-8.41%	-2.52%
Slovenia Control	121.64	8.49%	5.16%
SMATSA	79.39	16.04%	4.85%
UKSATSE	29.85	-5.27%	27.79%

2A: CONTINENTAL ATCOS IN OPS EMPLOYMENT COST PER ATCO IN OPS HOUR (USD), PPP ADJUSTED

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	65.89	-21.17%	4.65%
AEROTHAI	119.98	16.09%	11.38%
Airways NZ	96.61	-0.28%	1.55%
Albcontrol	82.37	-26.85%	-2.92%
ANA	122.59	14.76%	-3.43%
ANS CR	189.16	-11.59%	-3.26%
ANS Finland	93.75	0.46%	-1.15%
ARMATS	63.01	34.56%	18.08%
ATNS	106.56	9.75%	7.14%
Austro Control	224.78	-5.98%	2.66%
Avinor (Continental)	133.56	-3.67%	13.03%
BULATSA	365.91	-19.18%	-3.69%
Croatia Control	222.79	4.79%	1.34%
DCAC Cyprus	89.43	2.25%	3.60%
DFS	330.44	-4.28%	2.58%
DHMI	261.16	38.49%	11.39%
DSNA	138.94	-2.22%	1.76%
EANS	193.35	49.90%	13.69%
ENAIRE	295.56	15.82%	3.94%
ENAV	224.44	19.04%	6.88%
FAA-ATO	157.84	25.86%	6.91%
HCAA	90.39	-14.47%	1.27%
HungaroControl	199.55	-7.20%	-0.91%
IAA	132.75	2.65%	1.81%
Isavia ANS	123.32	11.12%	3.21%
KCAA	51.19	-5.47%	-2.96%
LFV	244.36	95.76%	21.08%
LGS	104.69	-13.32%	7.62%
LPS	206.58	-7.57%	0.33%
LVNL	138.00	13.60%	-10.53%
MATS	96.69	-10.46%	10.20%
M-NAV	155.46	-21.51%	0.30%

ANSP	KPI	2019-2020 AGR	4-year CAGR
MOLDATSA	61.55	5.29%	16.42%
NATS (Continental)	219.68	33.18%	8.65%
NAV CANADA	107.58	-19.58%	-3.63%
NAV Portugal (Continental)	275.22	2.56%	7.00%
NAVIAIR	130.15	2.93%	4.59%
Oro Navigacija	110.00	-7.44%	1.10%
PANSA	372.01	24.77%	11.17%
ROMATSA	285.18	-3.60%	0.60%
Sakaeronavigatsia	63.67	-8.81%	6.13%
skeyes	284.09	33.96%	9.11%
Skyguide	161.21	-7.02%	-0.81%
Slovenia Control	187.17	8.68%	5.53%
SMATSA	195.41	13.40%	3.93%
UKSATSE	109.80	27.05%	25.19%

2B: CONTINENTAL ATCOS IN OPS HOUR PRODUCTIVITY

Formula: IFR flight hours / ATCOs in OPS hours

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	0.38	-55.85%	-18.37%
AEROTHAI	0.25	-23.83%	-6.02%
Airways NZ	0.46	-11.33%	-8.10%
Albcontrol	0.37	-37.70%	-2.55%
ANA	0.14	-63.97%	-24.83%
ANS CR	0.36	-56.78%	-19.73%
ANS Finland	0.26	-45.58%	-9.38%
ARMATS	0.06	-66.59%	-12.32%
ATNS	0.55	8.42%	2.36%
Austro Control	0.48	-42.09%	-8.94%
Avinor (Continental)	0.45	-20.35%	-5.91%
BULATSA	0.61	-26.41%	-5.38%
CAAS	0.20	-69.18%	-25.84%
Croatia Control	0.35	-55.39%	-13.45%
DCAC Cyprus	0.42	-56.10%	-14.57%
DFS	0.40	-56.14%	-15.69%
DHMI	0.44	-45.62%	-13.90%
DSNA	0.29	-58.04%	-17.51%
EANS	0.50	-34.38%	-10.36%
ENAIRE	0.38	-50.13%	-12.74%
ENAV	0.36	-45.50%	-11.20%
FAA-ATO	1.15	-8.21%	0.42%
HCAA	0.38	-56.00%	-10.36%
HungaroControl	0.45	-55.19%	-15.73%
IAA	0.35	-56.37%	-22.49%
Isavia ANS	0.75	-44.39%	-13.96%
JANS	0.48	-48.87%	-14.44%
KCAA	0.30	-19.92%	-1.74%
LFV	0.33	-45.11%	-12.03%
LGS	0.40	-51.12%	-10.82%
LPS	0.34	-51.39%	-17.58%

ANSP	KPI	2019-2020 AGR	4-year CAGR
LVNL	0.25	-52.51%	-15.93%
MATS	0.46	-52.35%	-11.91%
M-NAV	0.20	-58.04%	-8.24%
MOLDATSA	0.05	-59.96%	-10.45%
MUAC	1.29	-42.26%	-10.71%
NATS (Continental)	0.49	-48.62%	-12.27%
NAV CANADA	1.12	-15.93%	-1.69%
NAV Portugal (Continental)	0.50	-53.29%	-14.37%
NAVIAIR	0.38	-48.10%	-13.76%
Oro Navigacija	0.30	-47.24%	-7.27%
PANSA	0.49	-39.82%	-10.51%
ROMATSA	0.30	-57.18%	-16.87%
Sakaeronavigatsia	0.17	-44.74%	-16.90%
skeyes	0.25	-35.81%	-8.42%
Skyguide	0.42	-44.81%	-12.66%
Slovenia Control	0.32	-39.17%	-5.26%
SMATSA	0.37	-55.30%	-16.33%
UKSATSE	0.13	-26.47%	2.79%

2C: CONTINENTAL COSTS EXCLUDING ATCOS IN OPS EMPLOYMENT COSTS PER IFR HOUR (USD)

Formula: Costs excluding ATCOs in OPS employment costs / IFR flight hours

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	109.23	86.50%	22.46%
AEROTHAI	488.45	56.75%	15.30%
Airways NZ	319.93	3.32%	7.84%
Albcontrol	812.95	30.21%	6.80%
ANA	1,557.94	204.80%	31.69%
ANS CR	859.91	100.06%	18.38%
ANS Finland	729.34	92.26%	13.18%
ARMATS	1,325.24	149.09%	16.21%
ATNS	272.58	-1.02%	11.53%
Austro Control	949.27	82.27%	15.05%
Avinor (Continental)	481.63	51.96%	11.37%
BULATSA	616.01	106.46%	21.61%
Croatia Control	626.14	143.23%	20.27%
DCAC Cyprus	356.85	141.88%	12.77%
DFS	1,070.01	111.63%	17.12%
DHMI	571.71	148.74%	42.05%
DSNA	1,159.66	135.47%	23.84%
EANA	460.03	259.94%	
EANS	547.44	93.27%	26.42%
ENAIRE	721.05	141.26%	22.00%
ENAV	1,022.98	133.09%	17.99%
FAA-ATO	464.46	34.98%	7.90%
HCAA	329.24	64.78%	7.33%
HungaroControl	591.86	108.93%	17.03%
IAA	569.97	107.01%	18.26%
Isavia ANS	247.31	48.18%	35.15%

ANSP	KPI	2019-2020 AGR	4-year CAGR
KCAA	187.11	26.53%	10.53%
LFV	637.88	165.96%	28.50%
LGS	501.76	106.84%	16.30%
LPS	873.48	86.11%	13.14%
LVNL	2,898.61	109.93%	31.97%
MATS	366.88	80.01%	16.02%
M-NAV	601.47	76.30%	13.66%
MOLDATSA	1,236.40	95.80%	12.61%
MUAC	439.99	170.45%	33.27%
NATS (Continental)	1,009.88	149.92%	24.43%
NAV CANADA	334.24	40.57%	11.36%
NAV Portugal (Continental)	445.75	80.15%	20.53%
NAVIAIR	1,122.83	177.25%	28.43%
Oro Navigacija	513.60	62.69%	5.38%
PANSA	585.31	107.62%	20.46%
ROMATSA	812.95	119.35%	21.40%
Sakaeronavigatsia	899.10	102.10%	26.32%
skeyes	3,769.89	112.47%	26.72%
Skyguide	2,170.26	167.46%	27.48%
Slovenia Control	880.27	118.51%	16.48%
SMATSA	624.72	139.36%	21.96%
UKSATSE	935.89	24.49%	17.89%

2D: CONTINENTAL PROPORTION OF TOTAL COSTS MADE UP OF ATCO IN OPS EMPLOYMENT COSTS

Formula: ATCO in OPS employment Costs / Total Costs

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	0.32	-0.97%	5.10%
AEROTHAI	0.28	-3.35%	1.46%
Airways NZ	0.38	6.38%	1.79%
Albcontrol	0.09	-13.41%	-7.61%
ANA	0.35	2.14%	-1.62%
ANS CR	0.25	3.40%	1.90%
ANS Finland	0.32	-2.70%	-2.79%
ARMATS	0.21	20.83%	7.55%
ATNS	0.23	3.35%	-2.90%
Austro Control	0.30	-7.46%	-1.58%
Avinor (Continental)	0.39	-11.18%	4.65%
BULATSA	0.29	-8.55%	-0.43%
Croatia Control	0.33	-1.97%	-2.18%
DCAC Cyprus	0.29	-5.12%	4.36%
DFS	0.40	1.91%	2.16%
DHMI	0.22	8.15%	0.87%
DSNA	0.26	-0.27%	-0.85%
EANA	0.30	4.29%	
EANS	0.31	11.44%	0.72%
ENAIRE	0.43	-2.67%	-1.92%
ENAV	0.32	-4.83%	0.58%
FAA-ATO	0.23	1.50%	-0.85%
HCAA	0.31	10.30%	2.34%
HungaroControl	0.26	0.51%	1.88%
IAA	0.37	8.38%	6.96%
Isavia ANS	0.41	21.44%	-5.92%
KCAA	0.27	-0.36%	-5.80%
LFV	0.53	16.24%	3.53%
LGS	0.23	-11.42%	3.28%
LPS	0.29	1.82%	5.72%
LVNL	0.15	11.67%	-15.77%
MATS	0.28	3.31%	5.66%

ANSP	KPI	2019-2020 AGR	4-year CAGR
M-NAV	0.32	4.60%	-2.13%
MOLDATSA	0.24	2.95%	8.09%
MUAC	0.41	-7.37%	-3.16%
NATS (Continental)	0.28	2.87%	-0.28%
NAV CANADA	0.20	-25.74%	-9.32%
NAV Portugal (Continental)	0.45	12.26%	2.09%
NAVIAIR	0.23	-22.75%	-5.30%
Oro Navigacija	0.27	5.71%	3.13%
PANSA	0.37	1.40%	2.43%
ROMATSA	0.33	6.05%	1.80%
Sakaeronavigatsia	0.11	-13.76%	5.03%
skeyes	0.21	-1.75%	-5.03%
Skyguide	0.17	-31.32%	-9.88%
Slovenia Control	0.30	-12.83%	-3.21%
SMATSA	0.26	6.29%	2.07%
UKSATSE	0.20	2.81%	4.46%

3A: CONTINENTAL ANNUAL EMPLOYMENT COST PER ATCO IN OPS (USD)

Formula: ATCOs in OPS employment costs / No. ATCOs in OPS

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	38,855.01	-17.56%	7.79%
AEROTHAI	90,933.73	13.84%	10.54%
Airways NZ	125,025.74	1.10%	1.94%
Albcontrol	32,317.57	-46.81%	-11.72%
ANA	140,715.66	6.10%	-0.35%
ANS CR	152,598.98	-18.96%	-3.65%
ANS Finland	142,866.46	1.26%	-0.53%
ARMATS	26,469.18	-1.75%	10.58%
ATNS	54,571.27	-1.81%	2.39%
Austro Control	232,472.21	-20.73%	-1.25%
Avinor (Continental)	215,459.19	-1.24%	11.91%
BULATSA	114,787.65	-20.94%	0.27%
Croatia Control	145,634.01	3.70%	0.53%
DCAC Cyprus	108,699.58	-8.32%	0.26%
DFS	287,257.17	2.36%	4.64%
DHMI	65,080.86	17.75%	15.98%
DSNA	154,050.46	-1.57%	0.97%
EANA	27,455.67	19.78%	
EANS	137,053.10	13.88%	6.04%
ENAIRE	215,834.31	-8.02%	-1.68%
ENAV	167,992.62	-9.92%	-0.07%
FAA-ATO	218,561.47	1.15%	1.11%
HCAA	83,689.81	-16.67%	-3.96%
HungaroControl	142,434.77	-7.37%	0.74%
IAA	174,560.45	-0.62%	0.43%
Isavia ANS	190,448.38	3.93%	0.45%
KCAA	30,322.06	0.83%	-0.35%
LFV	360,209.14	70.39%	16.87%
LGS	79,327.87	-25.48%	9.28%
LPS	143,984.53	-29.01%	-5.13%
LVNL	195,994.99	13.61%	-10.06%
MATS	118,518.76	-10.51%	8.06%

ANSP	KPI	2019-2020 AGR	4-year CAGR
M-NAV	74,885.46	-17.70%	2.68%
MOLDATSA	30,465.49	-18.56%	11.40%
MUAC	387,633.67	14.47%	7.91%
NATS (Continental)	196,822.36	2.48%	2.19%
NAV CANADA	128,210.76	-33.74%	-8.72%
NAV Portugal (Continental)	313,044.31	-12.77%	6.07%
NAVIAIR	193,460.69	0.96%	2.67%
Oro Navigacija	88,899.89	-8.25%	0.91%
PANSA	129,876.12	-10.26%	2.50%
ROMATSA	137,509.83	-3.29%	2.08%
Sakaeronavigatsia	27,778.15	-5.52%	10.84%
skeyes	234,604.93	-10.99%	-0.41%
Skyguide	268,494.70	-6.44%	-0.30%
Slovenia Control	129,017.84	-16.02%	-2.20%
SMATSA	74,488.99	-5.52%	-0.73%
UKSATSE	35,376.17	-21.93%	23.19%

3A: CONTINENTAL ANNUAL EMPLOYMENT COST PER ATCO IN OPS (USD), PPP ADJUSTED

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	131,180.04	-19.94%	5.18%
AEROTHAI	230,361.08	16.09%	11.38%
Airways NZ	131,781.94	-0.28%	1.55%
Albcontrol	87,467.71	-43.72%	-10.01%
ANA	145,108.90	7.35%	-0.26%
ANS CR	273,862.25	-20.74%	-4.32%
ANS Finland	145,611.76	1.26%	0.10%
ARMATS	83,267.36	25.63%	17.20%
ATNS	132,106.83	-3.75%	-0.11%
Austro Control	265,014.20	-20.94%	-0.96%
Avinor (Continental)	206,066.82	-3.75%	12.46%
BULATSA	278,268.17	-52.21%	-15.56%
Croatia Control	292,953.60	3.20%	1.25%
DCAC Cyprus	162,124.67	-4.88%	1.74%
DFS	338,942.70	2.33%	5.01%
DHMI	242,537.08	9.19%	4.47%
DSNA	178,402.34	-2.22%	1.76%
EANA	66,393.57	-14.79%	
EANS	220,977.65	15.56%	5.30%
ENAIRE	307,259.06	-7.12%	-0.58%
ENAV	219,848.45	-9.16%	1.09%
FAA-ATO	218,561.47	1.15%	1.11%
HCAA	133,950.58	-14.47%	-2.18%
HungaroControl	306,684.89	-8.80%	-1.25%
IAA	195,934.35	-0.39%	0.89%
Isavia ANS	180,700.53	2.75%	-0.03%
KCAA	73,712.74	-5.47%	-2.96%
LFV	376,277.36	70.02%	16.89%
LGS	140,876.38	-25.02%	8.83%
LPS	248,637.82	-29.29%	-5.32%
LVNL	218,314.08	13.88%	-9.79%
MATS	179,522.38	-10.66%	8.30%

ANSP	KPI	2019-2020 AGR	4-year CAGR
M-NAV	207,961.38	-18.18%	1.96%
MOLDATSA	89,793.80	5.28%	16.61%
NATS (Continental)	222,172.73	2.20%	2.11%
NAV CANADA	144,253.53	-33.35%	-8.43%
NAV Portugal (Continental)	479,986.51	-12.92%	6.07%
NAVIAIR	190,897.32	2.73%	4.37%
Oro Navigacija	172,577.43	-8.25%	0.17%
PANSA	285,021.56	-12.33%	1.86%
ROMATSA	324,939.07	-8.95%	-0.87%
Sakaeronavigatsia	97,036.79	-8.81%	6.13%
skeyes	268,494.27	-10.60%	0.11%
Skyguide	224,865.31	-5.02%	1.45%
Slovenia Control	198,516.60	-15.87%	-1.86%
SMATSA	183,357.90	-7.67%	-1.60%
UKSATSE	130,102.85	4.71%	20.69%

3B: CONTINENTAL ANNUAL WORKING HOURS PER ATCO IN OPS

Formula: ATCOs in OPS hours / No. ATCOs in OPS

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	1,991.04	1.56%	0.51%
AEROTHAI	1,920.00	0.00%	0.00%
Airways NZ	1,364.00	0.00%	0.00%
Albcontrol	1,061.91	-23.06%	-7.30%
ANA	1,183.66	-6.45%	3.29%
ANS CR	1,447.82	-10.35%	-1.10%
ANS Finland	1,553.20	0.79%	1.26%
ARMATS	1,321.39	-6.64%	-0.74%
ATNS	1,239.76	-12.30%	-6.76%
Austro Control	1,179.00	-15.91%	-3.53%
Avinor (Continental)	1,542.94	-0.07%	-0.50%
BULATSA	760.49	-40.86%	-12.32%
CAAS	1,309.74	-28.00%	-7.88%
Croatia Control	1,314.92	-1.52%	-0.09%
DCAC Cyprus	1,812.93	-6.98%	-1.80%
DFS	1,025.72	6.90%	2.37%
DHMI	928.69	-21.16%	-6.21%
DSNA	1,284.00	0.00%	0.00%
EANS	1,142.86	-22.91%	-7.38%
ENAIRE	1,039.59	-19.80%	-4.35%
ENAV	979.53	-23.69%	-5.42%
FAA-ATO	1,384.69	-19.64%	-5.43%
HCAA	1,482.00	0.00%	-3.40%
HungaroControl	1,536.90	-1.72%	-0.34%
IAA	1,476.00	-2.96%	-0.91%
Isavia ANS	1,465.25	-7.54%	-3.14%
JANS	2,015.00	0.00%	0.00%
KCAA	1,440.00	0.00%	0.00%
LFV	1,539.86	-13.15%	-3.46%
LGS	1,345.68	-13.50%	1.13%
LPS	1,203.61	-23.49%	-5.63%
LVNL	1,581.95	0.25%	0.83%

ANSP	KPI	2019-2020 AGR	4-year CAGR
MATS	1,856.68	-0.23%	-1.72%
M-NAV	1,337.69	4.25%	1.66%
MOLDATSA	1,458.97	-0.01%	0.16%
MUAC	983.53	-16.23%	-3.98%
NATS (Continental)	1,011.33	-23.26%	-6.02%
NAV CANADA	1,340.92	-17.12%	-4.99%
NAV Portugal (Continental)	1,744.00	-15.10%	-0.87%
NAVIAIR	1,466.77	-0.19%	-0.21%
Oro Navigacija	1,568.92	-0.88%	-0.92%
PANSA	766.17	-29.73%	-8.38%
ROMATSA	1,139.43	-5.55%	-1.46%
Sakaeronavigatsia	1,524.00	0.00%	0.00%
skeyes	945.09	-33.26%	-8.24%
Skyguide	1,394.84	2.15%	2.28%
Slovenia Control	1,060.64	-22.59%	-7.00%
SMATSA	938.32	-18.58%	-5.33%
UkSATSE	1,184.95	-17.58%	-3.59%

3C: CONTINENTAL ANNUAL IFR HOURS PER ATCO IN OPS

Formula: IFR flight hours / No. ATCOs in OPS

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	749.32	-55.16%	-17.95%
AEROTHAI	479.12	-23.83%	-6.02%
Airways NZ	625.90	-11.33%	-8.10%
Albcontrol	391.59	-52.07%	-9.66%
ANA	166.98	-66.30%	-22.36%
ANS CR	526.80	-61.25%	-20.61%
ANS Finland	410.17	-45.15%	-8.24%
ARMATS	74.20	-68.80%	-12.97%
ATNS	681.31	-4.92%	-4.57%
Austro Control	564.93	-51.30%	-12.15%
Avinor (Continental)	698.09	-20.41%	-6.38%
BULATSA	460.35	-56.48%	-17.04%
CAAS	255.89	-77.81%	-31.69%
Croatia Control	465.91	-56.07%	-13.53%
DCAC Cyprus	755.90	-59.17%	-16.10%
DFS	409.05	-53.11%	-13.69%
DHMI	412.36	-57.12%	-19.24%
DSNA	370.44	-58.04%	-17.51%
EANA	142.40	-68.63%	
EANS	568.78	-49.42%	-16.97%
ENAIRE	396.51	-60.00%	-16.54%
ENAV	352.28	-58.41%	-16.01%
FAA-ATO	1,589.26	-26.23%	-5.03%
HCAA	564.98	-56.00%	-13.40%
HungaroControl	692.65	-55.96%	-16.02%
IAA	510.87	-57.66%	-23.19%
Isavia ANS	1,102.92	-48.58%	-16.66%
JANS	976.03	-48.87%	-14.44%
KCAA	438.02	-19.92%	-1.74%
LFV	505.42	-52.33%	-15.08%
LGS	536.58	-57.72%	-9.82%
LPS	403.52	-62.81%	-22.22%

ANSP	KPI	2019-2020 AGR	4-year CAGR
LVNL	391.97	-52.40%	-15.24%
MATS	851.40	-52.46%	-13.43%
M-NAV	270.23	-56.25%	-6.71%
MOLDATSA	78.32	-59.96%	-10.31%
MUAC	1,266.34	-51.63%	-14.27%
NATS (Continental)	491.51	-60.57%	-17.55%
NAV CANADA	1,495.47	-30.33%	-6.59%
NAV Portugal (Continental)	875.05	-60.34%	-15.12%
NAVIAIR	563.33	-48.20%	-13.94%
Oro Navigacija	464.70	-47.70%	-8.12%
PANSA	377.99	-57.72%	-18.01%
ROMATSA	345.77	-59.55%	-18.08%
Sakaeronavigatsia	258.32	-44.74%	-16.90%
skeyes	240.42	-57.16%	-15.97%
Skyguide	584.34	-43.62%	-10.67%
Slovenia Control	338.72	-52.91%	-11.89%
SMATSA	347.48	-63.60%	-20.78%
UKSATSE	155.93	-39.40%	-0.91%

3D: CONTINENTAL RATIO OF FRONTLINE SERVICE STAFF TO ATCO IN OPS

Formula: No. Frontline Service Staff / No. ATCOs in OPS

ANSP	KPI	2019-2020 AGR
AAI	0.25	0.00%
AEROTHAI	1.11	39.31%
Airways NZ	0.57	-13.99%
ANA	0.27	-6.45%
ATNS	1.02	2.63%
DHMI	1.40	-5.94%
EANA	1.16	-5.67%
ENAIRE	0.89	-1.10%
HungaroControl	1.33	0.57%
Isavia ANS	1.75	19.74%
JANS	1.53	-4.80%
LGS	3.84	-4.11%
NAV CANADA	1.24	-7.08%
Oro Navigacija	1.14	-1.50%
PANSA	1.33	0.13%

1: OCEANIC COST PER IFR HOUR (USD)

Formula: Total costs / IFR flight hours

ANSP	KPI	2019-2020 AGR	4-year CAGR
Airways NZ	215.22	203.87%	45.30%
FAA-ATO	125.78	45.16%	6.95%
Isavia ANS	346.91	110.62%	24.78%
NAV CANADA	70.75	25.14%	7.31%

2A: OCEANIC ATCO IN OPS EMPLOYMENT COST PER ATCO IN OPS HOUR (USD)

Formula: ATCOs in OPS employment costs / ATCOs in OPS Hours

ANSP	KPI	2019-2020 AGR	4-year CAGR
Airways NZ	97.74	0.42%	1.22%
FAA-ATO	226.05	32.69%	7.26%
Isavia ANS	145.23	7.20%	9.36%
NAV CANADA	107.22	-13.34%	-1.48%

2A: OCEANIC ATCO IN OPS EMPLOYMENT COST PER ATCO IN OPS HOUR (USD), PPP ADJUSTED

ANSP	KPI	2019-2020 AGR	4-year CAGR
Airways NZ	103.03	-0.96%	0.84%
FAA-ATO	226.05	32.69%	7.26%
Isavia ANS	137.80	5.98%	8.84%
NAV CANADA	120.64	-12.83%	-1.18%

2B: OCEANIC ATCO IN OPS HOUR PRODUCTIVITY

Formula: IFR flight hours / ATCOs in OPS hours

ANSP	KPI	2019-2020 AGR	4-year CAGR
Airways NZ	0.70	-68.52%	-34.79%
FAA-ATO	6.88	-12.28%	-0.17%
Isavia ANS	1.74	-54.36%	-15.23%
NAV CANADA	6.15	-7.25%	-2.43%

2C: OCEANIC COSTS EXCLUDING ATCOS IN OPS EMPLOYMENT COSTS PER IFR HOUR (USD)

Formula: Costs excluding ATCOs in OPS employment costs / IFR flight hours

ANSP	KPI	2019-2020 AGR	4-year CAGR
Airways NZ	74.68	179.00%	
FAA-ATO	92.91	43.74%	7.08%
Isavia ANS	263.23	103.93%	23.58%
NAV CANADA	53.31	40.76%	9.88%

2D: OCEANIC PROPORTION OF TOTAL COSTS MADE UP OF ATCO IN OPS EMPLOYMENT COSTS (USD)

Formula: ATCO in OPS employment Costs / Total Costs

ANSP	KPI	2019-2020 AGR	4-year CAGR
Airways NZ	0.65	4.97%	6.84%
FAA-ATO	0.26	4.21%	0.46%
Isavia ANS	0.24	11.52%	3.38%
NAV CANADA	0.25	-25.33%	-5.91%

3A: OCEANIC ANNUAL EMPLOYMENT COST PER ATCO IN OPS (USD)

Formula: ATCOs in OPS employment costs / No. ATCOs in OPS

ANSP	KPI	2019-2020 AGR	4-year CAGR
Airways NZ	133,323.09	0.42%	1.22%
FAA-ATO	313,015.20	6.63%	1.44%
Isavia ANS	190,448.38	3.93%	0.45%
NAV CANADA	113,583.77	-39.46%	-11.12%

3A: OCEANIC ANNUAL EMPLOYMENT COST PER ATCO IN OPS (USD), PPP ADJUSTED

ANSP	KPI	2019-2020 AGR	4-year CAGR
Airways NZ	140,527.67	-0.96%	0.84%
FAA-ATO	313,015.20	6.63%	1.44%
Isavia ANS	180,700.53	2.75%	-0.03%
NAV CANADA	127,796.29	-39.11%	-10.85%

3B: OCEANIC ANNUAL WORKING HOURS PER ATCO IN OPS

Formula: ATCOs in OPS hours / No. ATCOs in OPS

ANSP	KPI	2019-2020 AGR	4-year CAGR
Airways NZ	1,364.00	0.00%	0.00%
FAA-ATO	1,384.69	-19.64%	-5.43%
Isavia ANS	1,311.35	-3.05%	-8.15%
NAV CANADA	1,059.34	-30.14%	-9.79%

3C: OCEANIC ANNUAL IFR HOURS PER ATCO IN OPS

Formula: IFR flight hours / No. ATCOs in OPS

ANSP	KPI	2019-2020 AGR	4-year CAGR
Airways NZ	948.63	-68.52%	-34.79%
FAA-ATO	9,522.34	-29.51%	-5.59%
Isavia ANS	2,276.02	-55.75%	-22.14%
NAV CANADA	6,514.69	-35.21%	-11.98%

3D: OCEANIC RATIO OF FRONTLINE SERVICE STAFF TO ATCOS IN OPS

Formula: No. Frontline Service Staff / No. ATCOs in OPS

ANSP	KPI	2019-2020 AGR
Airways NZ	0.72	-6.34%
Isavia ANS	1.52	2.55%
NAV CANADA	0.34	-14.29%

CO1: COMBINED COST PER IFR HOUR (USD)

Formula: Total costs /IFR flight hours

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	161.09	85.63%	25.00%
AEROTHAI	678.24	54.64%	15.93%
Airways NZ	475.45	35.51%	15.61%
Albcontrol	895.48	28.17%	5.77%
ANA	2,400.63	208.25%	30.47%
ANS CR	1,149.59	102.27%	19.09%
ANS Finland	1,077.65	89.71%	11.52%
ARMATS	1,681.99	160.65%	18.14%
ATNS	335.06	-3.12%	9.93%
Austro Control	1,360.78	75.90%	14.22%
Avinor (Continental)	790.28	39.70%	14.22%
BULATSA	865.36	98.65%	21.39%
CAAS	1,708.85	290.91%	48.16%
Croatia Control	938.73	140.79%	18.86%
DCAC Cyprus	500.65	136.62%	14.51%
DFS	1,772.26	114.23%	18.66%
DHMI	729.54	153.92%	42.38%
DSNA	1,575.52	135.24%	23.45%
EANA	652.84	266.15%	
EANS	788.40	102.01%	26.81%
ENAIRE	1,265.39	136.27%	20.10%
ENAV	1,499.85	127.58%	18.30%
FAA-ATO	567.53	36.19%	7.48%
HCAA	477.37	71.70%	8.38%
HungaroControl	797.50	109.30%	17.75%
IAA	911.66	116.60%	22.24%
Isavia ANS	354.26	105.13%	25.17%
KCAA	256.33	26.36%	7.65%
LFV	1,350.58	207.47%	32.93%
LGS	649.60	98.98%	17.32%
LPS	1,230.30	87.47%	15.38%

ANSP	KPI	2019-2020 AGR	4-year CAGR
LVNL	3,398.64	113.71%	25.96%
MATS	506.08	82.20%	18.14%
M-NAV	878.59	79.87%	12.46%
MOLDATSA	1,625.37	97.57%	14.90%
MUAC	746.09	155.48%	29.98%
NATS (Continental)	1,410.32	152.68%	24.29%
NAV CANADA	360.65	28.11%	7.91%
NAV Portugal (Continental)	803.50	95.94%	22.40%
NAVIAIR	1,466.25	152.28%	25.97%
Oro Navigacija	704.91	65.97%	6.50%
PANSA	928.91	109.31%	22.05%
ROMATSA	1,210.65	125.47%	22.41%
Sakaeronavigatsia	1,006.64	98.24%	26.99%
skeyes	4,745.70	111.49%	24.80%
Skyguide	2,629.75	141.64%	23.84%
Slovenia Control	1,261.17	104.60%	14.68%
SMATSA	839.08	144.22%	22.78%
UKSATSE	1,162.75	25.32%	19.02%

CO2D: COMBINED PROPORTION OF TOTAL COSTS MADE UP OF ATCO IN OPS EMPLOYMENT COSTS

Formula: ATCO in OPS employment Costs / Total Costs

ANSP	KPI	2019-2020 AGR	4-year CAGR
AAI	0.32	-0.97%	5.10%
AEROTHAI	0.28	-3.35%	1.46%
Airways NZ	0.40	6.25%	2.35%
Albcontrol	0.09	-13.41%	-7.61%
ANA	0.35	2.14%	-1.62%
ANS CR	0.25	3.40%	1.90%
ANS Finland	0.32	-2.70%	-2.79%
ARMATS	0.21	20.83%	7.55%
ATNS	0.23	3.35%	-3.63%
Austro Control	0.30	-7.46%	-1.58%
Avinor (Continental)	0.39	-11.18%	4.65%
BULATSA	0.29	-8.55%	-0.43%
Croatia Control	0.33	-1.97%	-2.18%
DCAC Cyprus	0.29	-5.12%	4.36%
DFS	0.40	1.91%	2.16%
DHMI	0.22	8.15%	0.87%
DSNA	0.26	-0.27%	-0.85%
EANA	0.30	4.29%	
EANS	0.31	11.44%	0.72%
ENAIRE	0.43	-2.67%	-1.92%
ENAV	0.32	-4.83%	0.58%
FAA-ATO	0.23	1.54%	-0.83%
HCAA	0.31	10.30%	2.34%
HungaroControl	0.26	0.51%	1.88%
IAA	0.37	8.38%	6.96%
Isavia ANS	0.26	12.41%	1.80%
KCAA	0.27	-0.36%	-5.80%
LFV	0.53	16.24%	3.53%
LGS	0.23	-11.42%	3.28%
LPS	0.29	1.82%	5.72%
LVNL	0.15	11.67%	-15.77%
MATS	0.28	3.31%	5.66%

ANSP	KPI	2019-2020 AGR	4-year CAGR
M-NAV	0.32	4.60%	-2.13%
MOLDATSA	0.24	2.95%	8.09%
MUAC	0.41	-7.37%	-3.16%
NATS (Continental)	0.28	2.87%	-0.28%
NAV CANADA	0.21	-25.74%	-9.20%
NAV Portugal (Continental)	0.45	12.26%	2.09%
NAVIAIR	0.23	-22.75%	-5.30%
Oro Navigacija	0.27	5.71%	3.13%
PANSA	0.37	1.40%	2.43%
ROMATSA	0.33	6.05%	1.80%
Sakaeronavigatsia	0.11	-13.76%	5.03%
skeyes	0.21	-1.75%	-5.03%
Skyguide	0.17	-31.32%	-9.88%
Slovenia Control	0.30	-12.83%	-3.21%
SMATSA	0.26	6.29%	2.07%
UKSATSE	0.20	2.81%	4.46%

ANNEX 6: EXCHANGE RATES

All exchange rates are the 2020 average for US Dollar per local currency. For sources please see Annex 8.

ANSP	Currency	2020 Exchange Rate
AAI	INR	0.0135
AEROTHAI	THB	0.0320
Airservices	AUD	0.6882
Airways NZ	NZD	0.6485
Albcontrol	ALL	0.0092
ANA	EUR	1.1422
ANS CR	CZK	0.0431
ANS Finland	EUR	1.1422
ARMATS	AMD	0.0020
ATNS	NTD	0.0608
Austro Control	EUR	1.1422
Avinor (Continental)	NOK	0.1062
BULATSA	BGN	0.5826
CAAS	SGD	0.7248
Croatia Control	HRK	0.1512
DCAC Cyprus	EUR	1.1422
DFS	EUR	1.1422
DHMI	TRY	0.1424
DSNA	EUR	1.1422
EANA	ARS	0.0142
EANS	EUR	1.1422
ENAIRE	EUR	1.1422
ENAV	EUR	1.1422
FAA-ATO	USD	1.0000
HCAA	EUR	1.1422
HungaroControl	HUF	0.0032
IAA	EUR	1.1422
Isavia ANS	ISK	0.0074
JANS	JPY	0.0094
KCAA	KSH	0.0094
LFV	SEK	0.1086

ANSP	Currency	2020 Exchange Rate
LGS	EUR	1.1422
LPS	EUR	1.1422
LVNL	EUR	1.1422
MATS	EUR	1.1422
M-NAV	MKD	0.0185
MOLDATSA	MDL	0.0577
MUAC	EUR	1.1422
NATS (Continental)	GBP	1.2821
NAV CANADA	CDN	0.7456
NAV Portugal (Continental)	EUR	1.1422
NAVIAIR	DKK	0.1529
Oro Navigacija	EUR	1.1422
PANSA	PLN	0.2564
ROMATSA	RON	0.2356
Sakaeronavigatsia	GEL	0.3216
SANS	SAR	0.2667
skeyes	EUR	1.1422
Skyguide	CHF	1.0651
Slovenia Control	EUR	1.1422
SMATSA	RSD	0.0097
UKSATSE	UAH	0.0371

ANNEX 7: ACRONYMS AND ABBREVIATIONS

ACE	ATM Cost Effectiveness
ACI	Airports Council International
ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
ASK	Available Seat Kilometres
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATFM	Air Traffic Flow Management
ATM	Air traffic management
CAGR	Compound Annual Growth Rate
CANSO	Civil Air Navigation Services Organisation
CAPEX	Capital Expenditure
FTE	Full Time Equivalent
GBWG	Global Benchmarking Workgroup
GDP	Gross Domestic Product
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
IMF	International Monetary Fund
KPI	Key Performance Indicator
MET	Aeronautical Meteorological
OECD	Organisation for Economic Co-operation and Development
OPS	Operations
PPP	Purchasing Power Parity
PRU	Performance Review Unit
RAT	Risk Analysis Took
RI	Runway Incursion
RPK	Revenue Passenger Kilometres
SMS	Safety Management System
SoE	Standard of Excellence
USD	United States Dollar
VFR	Visual Flight Rules

ANNEX 8: SOURCES

Definitions:

EUROCONTROL Specification for Economic Information Disclosure V3.0

ACE benchmarking report data dashboard:

[Eurocontrol.int/ACE/ACE-Home.html](https://eurocontrol.int/ACE/ACE-Home.html)

Industry Trends:

[IATA annual review – 2021](#)

[IATA global fact sheet](#)

[ICAO annual report 2020](#)

<https://www.icao.int/sustainability/Pages/Economic-Impacts-of-COVID-19.aspx>

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Exchange rate data:

data.oecd.org/conversion/exchange-rates.htm

data.imf.org/?sk=388dfa60-1d26-4ade-b505-a05a558d9a42

xe.com/currencytables/

PPP rate data:

data.oecd.org/conversion/purchasing-power-parities-ppp.htm

imf.org/external/datamapper/PPPEX@WEO/OEMDC/ADVEC/WEOWORLD



CANSO

canso.org

