

SEAMLESS COORDINATION

A Latin American and
Caribbean story

VIEWPOINTS:

Micilia Albertus-Verboom, DC-ANSP Director-General | Simon Hocquard, CANSO Director General

SPOTLIGHT:

DECEA's Sirius programme | Collaborating through CADENA | ATM and the environment
CANSO at the ICAO 40th Assembly | 75 years of the Chicago Convention | AZANS

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IN THIS ISSUE

5 EDITOR'S NOTE

Climate change must be tackled. The science is clear as is the public voice ringing out around the world.

6 SPOTLIGHT

Brazil's National Air Traffic Management Implementation Plan is proceeding apace with all areas of the country benefitting from new technologies.

9 CADENA

Enhancing the sharing of data is bringing significant benefits to airspace users in the Latin America and Caribbean region.

10 ENVIRONMENT

To achieve a sustainable future, the entire aviation industry must cooperate to meet environmental responsibilities.

14 AZANS

Farhan Guliyev, Director, Azerbaijan Azeraeronavigation Air Navigation Services (AZANS), outlines the ANSP's provision of cost-efficient, safe, secure, flexible and sustainable ATM while implementing advanced technologies and solutions.

16 LETTER FROM LATIN AMERICA AND CARIBBEAN

Micilia Albertus-Verboom, Director-General of the Dutch Caribbean Air Navigation Service Provider (DC-ANSP) and Chair CANSO Latin American and Caribbean region, shares her thoughts about regional developments.

18 CHICAGO CONVENTION

For 75 years, the Chicago Convention has helped align the skies of ICAO's 193 Member States through international regulations and standards.

20 ATM SUCESS STORIES

The wide-ranging submissions for the inaugural CANSO Award of Excellence in ATM demonstrate the value of partnership in ATM.

22 ACQUISITION EXCELLENCE

Adrian Miller, Head of Supply Chain Collaborations, NATS, explores the value found in collaboration.

25 CANSO VIEWPOINT

As more drones, air taxis and commercial spacecraft take flight, safely integrating these new players into already crowded skies and allowing equitable access to airspace is becoming a key priority, says Simon Hocquard, Director General of CANSO.

27 ICAO ASSEMBLY

CANSO submitted four working papers to the ICAO 40th Assembly to help drive forward industry-wide progress on key topics.

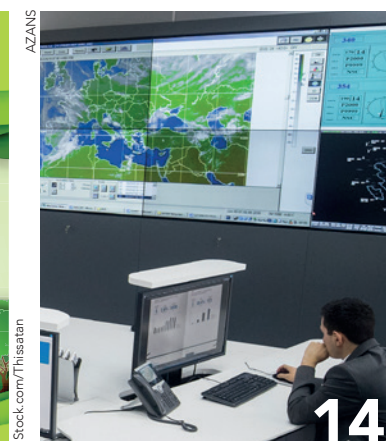


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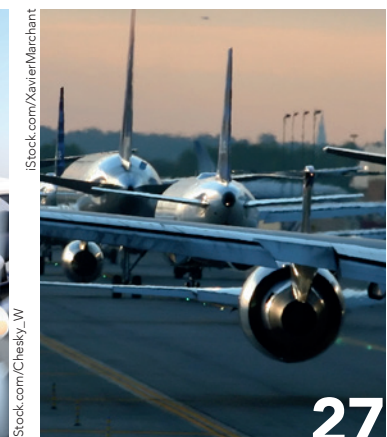
20



22



25



27

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Delivering the long-term environmental goal

Climate change must be tackled. The science is clear as is the public voice ringing out around the world.

Aviation is doing more than listen. In fact, for more than a decade it has had tough, self-imposed targets in place and at the recent ICAO Assembly received government support for a United Nations-backed long-term goal.

In this issue of *Airspace*, we pay special attention to the role of air navigation service providers in mitigating the industry's environmental impact (page 10). There is still a long road ahead but the work underway has got the journey off to an excellent start. ATM will continue to be at the forefront of industry efforts.

The ICAO Assembly discussed more than the environment, of course. CANSO submitted four papers on Efficiency in Air Traffic Management through Required Navigation Performance; Building Capacity in ATM; Ensuring Future Services by Adherence to Key Principles and Mutual Value; and Cyber Resilience. *Airspace* details the contents of the working papers and the Assembly outcomes (page 27).

This issue also celebrates the work that brought ICAO into existence in the first place. The Chicago Convention is turning 75 years old and is as relevant today as ever (page 18). Global cooperation on any subject is thin on the ground, but the skies prove what is possible with the right mindset.

We also turn the spotlight on Latin America and Caribbean as we head towards CANSO's regional conference. Micilia Albertus-Verboom, Director-General, Dutch Caribbean Air Navigation Service Provider (DC-ANSP) and Chair CANSO Latin American and Caribbean region, gives an excellent overview of regional developments (page 16).

We also take a look at the CADENA collaborative effort (page 9) and we detail Brazil's work in the Campos Basin to implement automatic dependent surveillance – broadcast (page 6). The project has been so successful that ADS-B has been pencilled in for other key Brazilian regions.

Collaboration is vital to progress in Azerbaijan too. National ANSP, AZANS, details various initiatives that prove the commitment to develop not only involves the entire value chain but is a worldwide phenomenon (page 14). A remote tower, meteorological information and datalink communication are all on the cards.

The final article in the excellent acquisition excellence series appears in this issue (page 22). Over the course of 2019, the articles have highlighted best practice in every aspect of purchasing. I urge you to check out the complete set of articles online at www.canso.org/publications. They could help to avoid a costly mistake.

Finally, through submissions for the CANSO Award of Excellence in ATM, we acknowledge the progressive efforts of air navigation service providers (ANSPs) that are driving this industry forward (page 20). Innovation has become part of the DNA of ANSPs, large and small and no matter their region. That is a definite cause for celebration and the platform on which climate change action is built.

Happy reading!

Graham Newton, Editor
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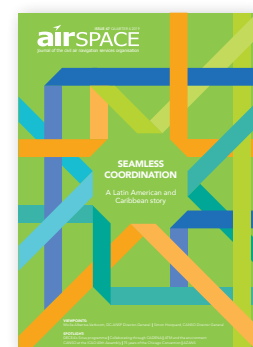
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Credit: DECEA

SIRIUS written in the stars

Brazil's National Air Traffic Management Implementation Plan is proceeding apace with all areas of the country benefitting from new technologies.

Brazil's SIRIUS programme manages the country's National Air Traffic Management Implementation Plan. Fully aligned with ICAO's Global Air Navigation Plan, the programme is based on the use of strategic solutions to continually evolve Brazilian ATM to a safer and more environmentally sustainable future.

"The implementation of the SIRIUS programme will ensure Brazil, in the short, medium and long terms, is able to increase operational capacity to meet the demand coming from forecasted air traffic growth while maintaining the desired levels of operational safety," says Lieutenant Brigadier Jeferson Domingues de Freitas, Director General of Brazilian ANSP, DECEA.

The most obvious benefits of SIRIUS include new air routes and significant improvements in existing routes thanks to performance-based navigation. Both domestic and international services are taking advantage.

The programme brings together a suite of expertise within DECEA, including communication, navigation and surveillance, aeronautical meteorology, aeronautical information management, search and rescue and human resources and performance.

This has ensured no stone has been left unturned in terms of requirements and has spread the programme's benefits far and wide.

Taking advantage

The most obvious benefits of SIRIUS include new air routes and significant improvements in existing routes thanks to performance-based navigation (PBN).

Both domestic and international services are taking advantage. Trans-Atlantic flights, especially in the crucial Europe-South America corridors, for example, have greater positional accuracy and upgraded voice and data communication, enabling enhanced aeronautical information exchange between pilots and controllers.

Not only do passengers enjoy shorter flights but also fuel burn is reduced as a result of the improved decision making, bringing considerable environmental gains.

The SIRIUS Legacy

- Operational safety improved
- More rational use of the airspace
- Reduction of harmful carbon emissions
- Noise reduction near airports
- Greater air traffic management efficiency
- Reduction of air traffic controllers' workload
- Reduction of pilots' workload
- Cost reduction for aircraft operators
- Cost reduction for air navigation services providers
- Better service for passengers

SIRIUS has also had a positive impact on noise mitigation efforts around airports with take-off and approach phases being expedited. As SIRIUS progresses, continuous climb and descent procedures, the use of preferred flight altitudes and numerous similar upgrades will enable a superior environmental performance and additionally improve operational safety and efficiency.

Automation

Meanwhile, the huge volume of information generated by the range of automated features that accompany various SIRIUS implementation projects will give DECEA opportunities for continual development.

Regulatory authorities stand to gain too. SIRIUS encourages robust yet open systems, enabling safety levels to be measured more easily and benchmarked on a regional and global basis, leading to smarter regulation.

SIRIUS even involves research and development institutions as continual upgrades will require new concepts to be developed, such as the effects of the ionosphere on satellite-based navigation systems.

Campos Basin

A case study of automatic dependent surveillance – broadcast (ADS-B) in the Campos Basin in southern Brazil – implemented in November 2018 – illustrates the improvements SIRIUS is bringing to Brazilian airspace.



Credit: DECEA

Greater ATM efficiency is a significant benefit of SIRIUS.



Credit: DECEA

SIRIUS has had a positive impact on noise mitigation efforts.

The region covers approximately 100,000km² and extends approximately 120 nautical miles from the coast. Known for its oil reserves, the main traffic in the Campos Basin is helicopters flying goods and people from Macaé airport to the offshore oil platforms at altitudes between 500ft and 4,500ft.

Older radar technology and the application of conventional separations hampered the efficiency of the flights, however, and meteorological conditions and low visibility in high seas increased concerns regarding safety.

A number of challenges had to be overcome to get ADS-B operational. The development of new regulations, training for different aircraft models from seven operators, the continuous management of safety risks and system sustainability all had to be considered.

However, following ADS-B implementation, aircraft separations have been minimised, delays cut 43% and flight punctuality increased 16% due to greater regularity in air operations and the reduction of flow control measures.

In addition, the region will benefit from faster and more cost-effective search and rescue missions, the reduction of ATCO workload, and a reduction in flight times and consequent fuel savings, estimated at BRZ1.31 million per year.

All the 122 helicopters flying in the region are already equipped with the requisite avionics but aircraft without ADS-B compatible technology can still be accommodated with appropriate permissions.

Overall, the project has demonstrated both the benefits of new technology and the value of SIRIUS as a master plan for the future of Brazilian air traffic management. Based on lessons learned from this project, for example, ADS-B implementation will continue in the oil basins located in Santos, Espírito Santo and in Brazilian continental areas.

SIRIUS will continue to guide DECEA's decisions. "The SIRIUS Program will raise the capacity of providers to continuously enhance the quality of the services provided to all aircraft operators and their pilots," concludes de Freitas. ➔



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Common situational awareness

Enhancing the sharing of data is bringing significant benefits to airspace users in the Latin America and Caribbean region.

Credit: DC-ANSP

Geography dictates that the Latin America and Caribbean region is reliant on aviation for global tourism and trade.

In the past, however, the air navigation service providers (ANSPs) in the region only cooperated in an informal manner. Air traffic flow management (ATFM) communication and collaborative decision making (CDM) were very limited, for example.

Exacerbating this lack of interaction are the severe tropical weather events that necessitate real-time collaborative communication procedures and capabilities between ANSPs and stakeholders.

To address the growing need for better collaboration and effective ATFM/CDM, the CANSO Latin America and Caribbean CEO Committee established the CANSO ATFM Data Exchange Network for the Americas (CADENA) Regional Implementation Group.

CADENA basically allows partners throughout the aviation value chain to share vital data and common situational awareness, and the introduction of the CADENA Operational Information System (OIS) in August 2017 has proven to be a game-changing tool.

The Regional Implementation Group initiated improved communication through a Letter of Agreement, weekly CADENA planning web conferences and ad hoc planning web conferences to address hurricane and other urgent ATFM issues, such as equipment failures, route changes, and cross-border ATFM delays.

During a recent surveillance outage in Bogota, for example, CADENA was able to effectively manage the flow of information and identify solutions to maintain efficient traffic flow. This saved 184,800kg of fuel, 536,880kg of CO₂ emissions, and USD192,000 for airborne operations and offered valuable insight for improving day-to-day operations.

Through the procedures, tools, and communication practices developed and established by CADENA, ANSPs in the Latin

American Airlines has praised the enhancements engendered by CADENA: "The CADENA OIS is considered a notable success at American Airlines and has won rapid praise by ATC coordinators, dispatchers and operations managers across the system," it noted in a statement. "ATC and traffic management initiative details throughout much of the Americas has dramatically improved thanks to the CADENA OIS."

America and Caribbean region have moved ATFM from a talking point to an operational reality.

CADENA offers each participant ANSP and stakeholder the opportunity to have a voice and play a central role in improving the safety, efficiency, cost-effectiveness and environmental sustainability of ATFM.

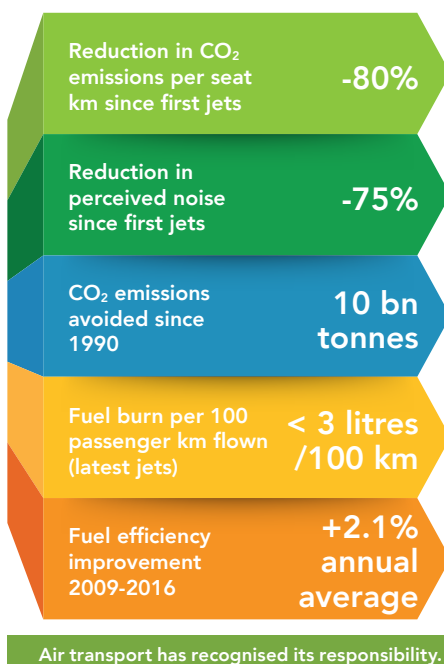
Most importantly, CADENA is providing leadership and a practical example of what can be achieved in numerous areas of operations. Such is its success that it is being discussed globally as a model that might be appropriate for other regions. ➔

For further examples, see: www.canso.org/regional-coordination-and-collaboration-are-key-managing-air-traffic-latin-america-and-caribbean



Credit: iStock.com/Thissatan

To achieve a sustainable future, the entire aviation industry must cooperate to meet environmental responsibilities.



Environmental mitigation is arguably the most important issue facing aviation today.

Air transport has recognised its responsibility for over a decade and set itself three tough targets unmatched by any other industry:

- 1) A fuel efficiency gain of 1.5% per annum
- 2) Carbon neutral growth from 2020
- 3) A 50% reduction in CO₂ levels by 2050 compared with 2005.

Although there is no silver bullet, the industry has adopted a range of environmental mitigation actions to reach its goals and achieve a sustainable future.

These have been contained within a four-pillar strategy based on operations, infrastructure, technology and market-based measures.

Powering sustainability

Of recent industry work, two areas are particularly noteworthy. Sustainable aviation fuels (SAF) continue to develop and proliferate. The challenge is to accelerate the uptake. Though SAF are a proven technology – the first flight using a SAF blend was in 2008 – SAF only represent 0.01% of total fuel use.

Government involvement through the correct policies and economic incentives is essential to push this figure higher. Simply, SAF prices need to be come down substantially.

“Sustainable aviation fuel already powers a small percentage of flights, demonstrating aviation’s commitment to reducing its carbon footprint,” says the Director General of the International Business Aviation Council, Kurt Edwards.

"However, its wide availability at competitive prices remains a key hurdle. Industry urges governments to implement policies to incentivise the production and up-take of SAF to meet long-term CO₂ reduction goals."

Supply will also be a key driver. SAF plants are slowly coming online and publicly announced projects should help SAF achieve 1% of total fuel use by 2025 – equivalent to approximately 3.5 billion liters annually. A sixth SAF certification pathway due for approval late in 2019 or in 2020 will be equally vital. The process will be based on biodiesel, which is available in large quantities, and so could lead to a significant increase in SAF.

Secondly, market-based measures took a significant leap forward with ICAO-level agreement on a Carbon Offset Reduction Scheme for International Aviation (CORSIA).

The scheme will offset 80% of the post-2020 growth in international aviation CO₂, mitigating around 2.5 billion tonnes of CO₂. It is the first market mechanism to be rolled out for a single global sector and will help mitigate the growth in air transport emissions while longer-term solutions for CO₂ are being ramped-up.

"The ATM industry is working with our partners and States to improve the environmental performance of aviation. From implementing new operational procedures to adopting the latest technologies, our members are playing an important role in developing sustainable air transport. We welcome the collaborative steps being taken to realise this."

Simon Hocquard, CANSO Director General

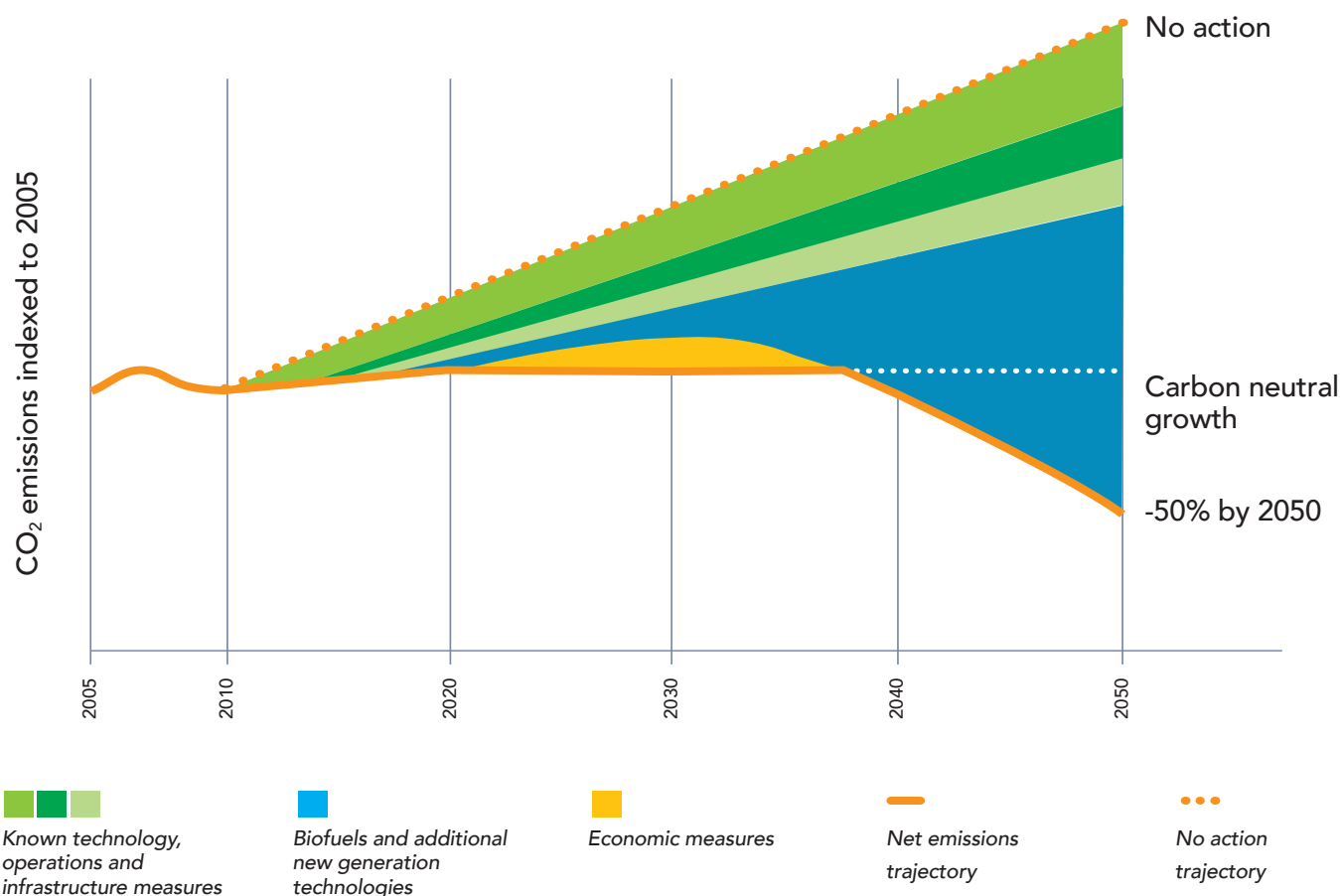
Airlines have already started the process to monitor, report and verify emissions from their international flights in preparation. Eighty-one countries are involved in the voluntary phase of CORSIA with more expected to join. Over \$40 billion in climate finance is expected to be generated through the scheme.

Efficient routes

Air navigation service providers (ANSPs) also have a role to play in ensuring aviation meets its environmental responsibilities. "As passenger numbers look set to double over the next two decades, the air traffic

management (ATM) industry is continuing to develop a range of measures to improve the efficiency of aviation and support safe, seamless and sustainable air transport," says Simon Hocquard, Director General, CANSO. "From implementing new operational procedures to adopting the latest technologies, the ATM industry has an important role to play in improving the efficiency of aviation, reducing flying time and fuel burn, and building a strong and agile global transport network for the future."

The goal for ANSPs is to enable aircraft to fly the most efficient and flexible routes, saving time and therefore reducing fuel burn and



The "Basket of Measures" is aviation's four-pillar strategy aimed at meeting its ongoing environmental responsibilities.

NATS study

Aviation's environmental footprint is coming under increasing public scrutiny as movements such as "Flying Shame" generate media attention.

According to NATS' annual study of attitudes to flying, 60% of respondents wanted to see reducing emissions made the top priority for the aviation industry. Yet the number of people who believe flying should be discouraged fell from 47% to 40%, even if this might have a negative impact on the environment.

More people are willing to pay some form of climate change levy to assist environmental efforts – the number agreeing rising from 30% to 38%.

"What these results show us is that people are concerned about the real impact aviation has on our environment, but that flying and global connectivity is also totally intrinsic to our way of life," says Ian Jopson, NATS Head of Environment. "What's needed is a way to radically improve the efficiency of every flight, part of which is down to more efficient aircraft, but we can also make a big contribution by transforming how our airspace is structured and managed."

NATS alongside many of the UK's major airports will be bringing forward proposals for how to modernise the UK's airspace at the end of next year to help radically improve flight efficiency. Measures are likely to include keeping aircraft higher for longer and cutting the amount of fuel-thirsty, low-level stack holding at airports.

the corresponding emissions. One pathway to this ideal is through performance-based navigation (PBN), where greater positional accuracy leads to improved trajectories.

In the Dominican Republic, for example, local ANSP, IDAC, is using PBN to save approximately 20,000 nautical miles (NM) a month while COCESNA – the Honduran ANSP – cut over 18,000 tonnes of CO₂ in 2018 thanks to PBN and is set to register even bigger savings this year.

Free route airspace (FRA) in Europe, meanwhile, is making an enormous difference to congested skies. In 2017, the implementation of FRA in Europe saved one million NM. This figure will only grow as FRA becomes more widely adopted. EUROCONTROL estimates FRA has already delivered 2.6 million tonnes of CO₂ emissions savings since 2014.

Collaborative measures

Among the many developments in ATM are air traffic flow management (ATFM) and collaborative decision-making (CDM), which rely on cooperation and the sharing of information to improve traffic flow in a coordinated manner.

Multi-Nodal ATFM has delivered qualitative and quantitative benefits in Asia Pacific. Alongside enhanced safety and predictability, it has enabled significant fuel burn and emissions reductions.

The Civil Aviation Authority of Singapore (CAAS) estimates ATFM has cut 43,000 metric tons of emissions at Changi Airport. In addition, CDM has allowed CAAS to optimise the departure sequence and reduce take-off waiting time of flights at the runway holding point. On average during

peak departure periods, departures can experience a reduction in taxi-out time of approximately 90 seconds.

Across the world in Argentina, the successful implementation of CDM between air traffic control, airlines and the regulator in October 2018 led to the modification of 43% of the route network. The optimisation has saved 11 million litres of fuel, 44,000 tons of CO₂ and USD29 million in operating costs for domestic flights.

Continuous descent and climb operations, space-based automatic dependent surveillance – broadcast (ADS-B) and digital towers will also help ATM streamline the network and operations to ensure environmental gains.

Other green initiatives going forward will rely on big data and artificial intelligence. A case in point is a NATS analysis of actual flown data versus flight plans that showed one airline carried an extra 550kg of fuel in anticipation of flying at lower altitudes but rarely had to do so.

Similarly, the Maastricht Upper Area Control Centre (MUAC) uses big data to report on the efficiency of the capacity planning process, past air traffic regulations and controller workload. The findings feed into tactical decision-making and future planning.

Artificial intelligence will help to process large amounts of data fast and accurately. By making it easier for ATCOs to predict and avoid situations that could become critical, safety, capacity and efficiency will be improved throughout ATM.

Automation will be crucial in this regard. Experts anticipate that automation will enable global, real time, predictive and more complex decision-making and will be especially important as drones proliferate. System-wide information management (SWIM) is ATM's main development in this regard.

2050 focus

The industry is now seeking a timeframe for agreement on a long-term target to reduce CO₂ emissions from air transport. Speaking on the sidelines of the UN Climate Action Summit, Michael Gill, Executive Director of the cross-industry Air Transport Action Group said: "Aviation helps power the global economy and provides connectivity to families, business and society whilst also supporting 65.5 million jobs. It is growing to meet the needs particularly of developing economies, but we also recognize that with growth comes responsibility."

"Along with its commitment to CORSIA, the aviation industry has invested billions in measures and practices which have made significant progress in reducing its environmental impact. This is a global challenge that requires a coordinated global response. Collaboration across the whole industry is needed to reduce emissions and airports remain committed to the active steps needed to address the environmental impact of operations."

Angela Gittens, Director General of Airports Council International

Top 5 things to do



According to a EUROCONTROL paper, net zero carbon aviation by 2050 will require a focus on five key areas.

"The industry is committed to further reducing its climate impact – already a flight taken by a passenger today will produce half the CO₂ that the same flight would have in 1990 – and our existing industry long-term goal to halve net total CO₂ emissions by 2050 remains a robust and ambitious focus for industry action in line with the Paris Agreement," he continued. "We urge governments also to adopt a pathway towards a UN-backed long-term goal for aviation and set in place the right policy environments to meet the needs of that goal. Importantly, those policies must be implemented by governments in the short-term to help build a foundation for meaningful long-term reductions in CO₂: we can't wait until 2049 to take action."

EUROCONTROL's report on decarbonization notes that "ATM's "benefit pool" is finite and will eventually run dry, as efficiency improvements currently planned are delivered. Indeed, it may be challenging to maintain efficiencies as traffic grows".

It suggests, therefore, that ATM will also need to turn its attention to the safe introduction of new types of aircraft into congested airspace and airports, so that "neither a drop of SAF, nor a kilowatt-hour of electrical energy", is wasted.

It also advises ANSPs in Europe to look at the route charges system, through which aircraft operators pay for air traffic control-related services, to incentivise green flights. "This is perhaps an underappreciated tool that ATM could use to support decarbonisation of our industry," the report concludes. ➤

"The most promising means to achieving a sustainable future is with sustainable aviation fuels. Airline investments in SAF have powered hundreds of thousands of commercial flights. But the potential of SAF is far from being realised because costs are too high. Governments must play their role and set a comprehensive policy framework to support the commercialisation of this critical key to sustainability."

Alexandre de Juniac, Director General and CEO of the International Air Transport Association



Airbus E-FanX – a short-haul hybrid-electric aircraft demonstrator due to fly in 2021.

Credit: Airbus

Put an end to isolation

Farhan Guliyev, Director, Azerbaijan Azeraeronavigation Air Navigation Services (AZANS), outlines the ANSP's provision of cost-efficient, safe, secure, flexible and sustainable ATM while implementing advanced technologies and solutions.



Credit: AZANS

Today, every part of business is subject to smart developments, new competitors, challenges, threats and opportunities. As the number of smart devices, such as phones, tablets, PCs and electronic cars increases, companies that quickly deliver digital products or services and those who reap data and use insights to rapidly optimise their value chain, are gaining a corresponding advantage.

Many companies today are at different stages of digital transformation. Achieving maturity requires the courage to challenge entrenched beliefs within one's organisation. A company that wishes to stay one-step ahead must learn to identify and question entrenched "facts" and discover how technology can influence them.

Companies that use everything in digital form can interact more closely with customers and operations, increase the quality and level of services and contribute to the company image.

Transforming aviation

The world of aviation and space is at the forefront of this revolution. It must follow the increasingly high quality standards set by its customers throughout the value chain and manage the emergence of new players who can offer solutions based on new digital

technologies. All stakeholders in the air transport industry are targets of this transformation.

Take modern flight entertainment solutions, for example. The ability to offer passengers more personalized options and provide them full access to high-speed Internet during flight, allowing them to manage their personal or business affairs, poses enormous technical challenges.

But these innovations are just the tip of the iceberg, merely representing digital opportunities that are most easily perceived by the public.

In addition to a closer and more thorough relationship between the customer and the business, airlines and air navigation service providers (ANSP) must develop digital technologies that take advantage of connectivity so they can work together.

This connection requires the installation of secure, seamless communication lines between aircraft, as well as between air, ground and satellite devices. Cybersecurity is vital in this regard.

Unmanned and civilian aircraft must be protected from terrorist threats. But the risk of cyberattacks increase with the introduction



Credit: AZANS

Airlines and ANSPs must develop digital technologies that take advantage of connectivity so they can work together.

of non-aviation digital technologies and concepts, including 5G, Wi-Fi, and web-based applications.

An isolated approach will not solve existing and future problems in this area. The fact is we are all already connected to each other. Only joint efforts will provide resilience against cyberattacks and build a strong common cybersecurity platform that will help us to avoid problems in the future.

It is very important to get the entire aviation value chain involved, including system and technology suppliers, even though they are sometimes reluctant to share their proprietary information due to commercial interests. A declaration on joint efforts against cyber threats among ATM partners was signed in Baku in 2019, showing that we are on the right path.

Managing traffic flow

AZANS, meanwhile, is forging ahead with the implementation of technologies that will assist in the provision of cost-efficient, safe, secure, flexible and sustainable air traffic management.

We are the global launch customer for ECOsystem, for example, an advanced traffic flow management application. The implementation of ECOsystem in the Airspace Supervision and Efficiency Center (ASEC) supports AZANS' goals of high-quality air navigation services in line with international standards and modernizing technical systems and information services.

The ECOsystem is structured with a suite of advanced cybersecurity features and enables AZANS to:

- Better forecast demand and manage capacity
- Proactively optimise flights according to weather, congestion and other factors
- Assess the expected impact of initiatives before implementation
- Seamlessly integrate with arrival and departure sequencing tools
- Reduce flight time, fuel load/burn, and associated environmental impact
- Optimise the use of resources and improve controller productivity.

Weather forecast

Another new high-tech project is the implementation of a virtual air traffic control tower. This is the first of its kind in Azerbaijan. The virtual tower will enable AZANS to perform contingency operations at Azerbaijani airports by providing air traffic services remotely from Baku.

Digitisation in the field of meteorological information provision of flights is also one of the main aims of AZANS. Some digital weather technologies have already been launched and it is expected that the project will be completed in the first half of 2020. Digital ATIS/

Digitisation in the field of meteorological information provision of flights is also one of the main aims of AZANS. Digital ATIS/ VOLMET allows pilots to retrieve the latest information on local weather conditions or runway and taxiway instructions via DataLink.



Credit: AZANS

The entire aviation value chain must be involved in joint efforts.

VOLMET allows pilots to retrieve information on local weather conditions or runway and taxiway instructions via DataLink. It is also planned to establish a system of digital and artificial intelligence weather forecasting over the territory of the Republic of Azerbaijan and the Caspian Sea.

The implementation of datalink services also enables AZANS to transmit clearance information to departing aircraft via datalink. This is accomplished through a highly available, simple, secure and easy-to-use turnkey Datalink Departure Clearance (DCL) service.

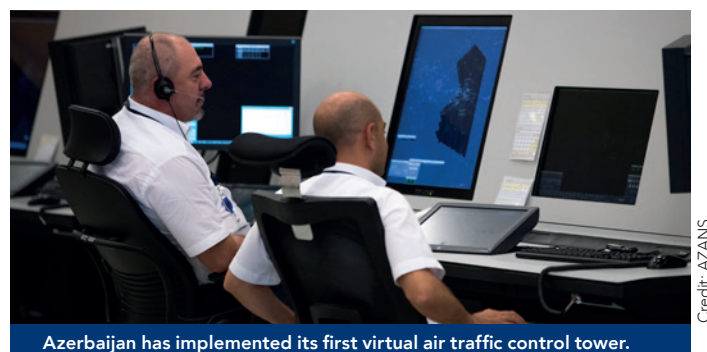
Finally, AZANS is looking to develop and safely integrate unmanned aircraft into controlled airspace by leveraging the advances brought about by digital transformation. Our priority is to ensure that by embracing innovation, we don't compromise the safety of traditional manned aviation operations.

Assessment planning

The world of air traffic control is changing fast with technological revolution pushing the industry into the digital era. As a result, regulations, staff recruitment, customer and airline expectations, competition and new airspace users all require a fresh approach. The pace of change is such that timely planning, the correct allocation of resources and informed decision making are all critical even as the highest levels of flight safety are maintained.

This requires significant financial resources and shifting from a traditional short-term approach to performance and assessment-based planning. This approach was behind the implementation of the ASEC centre.

But most of all, it needs partnership between ANSPs and the aviation value chain. Let's put our efforts into breaking the isolation of the ANSP world. ➔



Credit: AZANS

Azerbaijan has implemented its first virtual air traffic control tower.

Keep moving forwards

Micilia Albertus-Verboom, Director-General, Dutch Caribbean Air Navigation Service Provider (DC-ANSP) and Chair CANSO Latin American and Caribbean region, shares her thoughts about regional developments.



Credit: DC-ANSP

Aviation in Latin American and Caribbean (LAC) is going through an evolution.

Historically, the aviation industry in the region has been highly regulated, with expensive airline tickets and protectionism of national carriers. But a notable shift is occurring as governments stop interfering in the commercial decisions of air carriers, largely due to the incorporation of the Open Skies Agreements (OSAs).

Since the first agreement was signed between the United States and the Netherlands in 1992, over 300 OSAs involving more than 150 states all over the world have been signed. The OSAs have provided concrete value such as:

- a more positive end-user experience
- more accessible travel options
- greater economic development
- increased traffic growth.

The OSAs and other bilateral agreements are a contributing factor in the growth of air travel in the LAC region and this is expected to continue in the future.

Additionally, 2018 was a very positive year for Latin American and Caribbean airlines in terms of route development, with the introduction of a total of 64 new routes, 22 domestic routes and 42 international.

While the growth in air traffic is good for the local economy, it is putting pressure on the existing aviation infrastructure and requires the air navigation service providers (ANSPs) in the region to provide greater capacity.

Regional collaboration

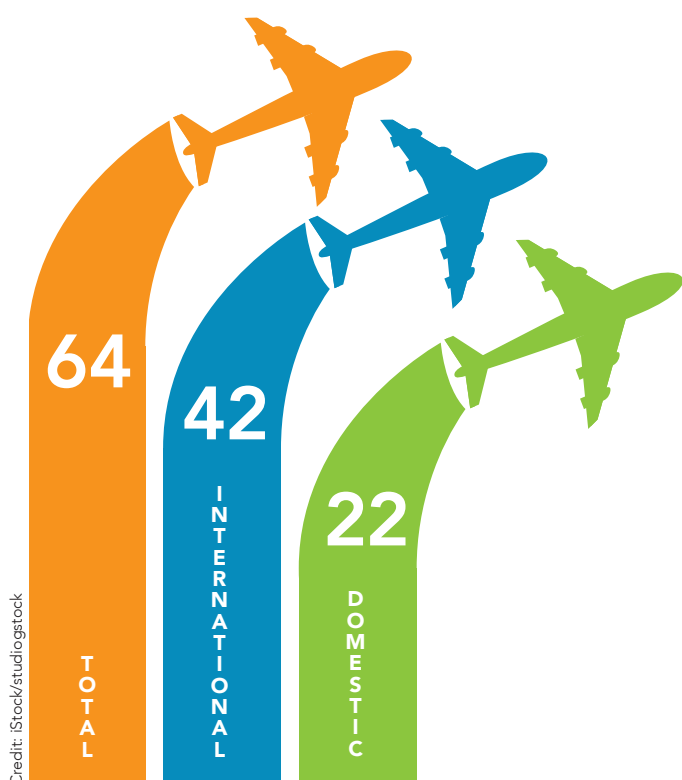
A high priority for CANSO in the Latin America and Caribbean region is cooperation between the airlines and ANSPs to enhance safety and operational efficiency.

In 2017, CANSO established the CANSO Air Traffic Flow Management (ATFM) Data Exchange Network for the Americas (CADENA) to accomplish these goals.

CADENA facilitates data sharing and promotes a common situational awareness that is vital to the safe, efficient, and harmonised flow of air traffic in the region. This was an important step in moving from very limited communication and collaborative decision-making to a region-wide, common situational awareness.

Communication is a crucial factor and CADENA pays dividends, which contributes to the progress of the aviation industry in the LAC region by openly discussing topics, such as weather, staffing, combined sectors, equipment outages, traffic management measures (TMM), and airport configuration.

Communication is a crucial factor and CADENA pays dividends, which contributes to the progress of the aviation industry in the LAC region by openly discussing topics, such as weather, staffing, combined sectors, equipment outages, traffic management measures, and airport configuration.



The LAC region enjoyed significant route development during 2018.

Credit: iStock/studio stock

Reducing the environmental impact of aviation is also of great importance and it is vital that ANSPs play an active role in keeping the planet healthy.

An example of this effort is Corporación Centroamericana de Servicios de Navegación Aérea (COCESNA), which has been promoting, as a strategic objective, practices that allow for better environmental care. These practices range from more direct air navigation routes to cleaner and more responsible technologies, which has resulted in energy consumption savings of 14.45%. It is important to continue to take steps to improve and preserve the planet's environment.

Innovative measures

New developments have had a big impact on the Latin American and Caribbean region. Because of the changes that are taking place a lot of countries are investing in innovative measures to improve the concept of operations, techniques and policies for enhanced safety, capacity and performance (see map).

With all these innovations, it is clear that ANSPs in the region are using the right tools to withstand the various challenges that arise in the industry. Air navigation services are improving safety, capacity and efficiency. Let's keep moving forward! ➔



Countries in the Latin American and Caribbean region are investing in innovative measures to enhance safety, capacity and performance.

Still going strong



Signing of the Chicago Convention on 7 December 1944.

Credit: Dominique Hymans (ayant-droit de certaines archives de Max Hymans)

For 75 years, the Chicago Convention has helped align the skies of ICAO's 193 Member States through international regulations and standards.

The value of aviation's global system of cooperation should not be underestimated. Not only does it ensure that all stakeholders in the industry value chain operate safely, securely and efficiently while minimising their carbon footprint but also it delivers close to US\$3 trillion in economic generation and supports some 66 million jobs.

The system was put in place 75 years ago when delegates gathered in the Grand Ballroom of the Stevens Hotel in Chicago at the invitation of the United States. The participants agreed the Convention on International Civil Aviation, known generally as the Chicago Convention, which established ICAO and the basic rules that have governed global civil aviation ever since.

Chicago Convention Articles

The Chicago Convention was signed on 7 December 1944, by 52 signatory States. It was ratified in March 1947 and went into effect in April of that year.

A non-comprehensive summary of some of the key articles includes:

- Article 1:** Every state has complete and exclusive sovereignty over airspace above its territory.
- Article 5:** The aircraft of states, other than scheduled international air services, have the right to make flights across state's territories and to make stops without obtaining prior permission. However, the state may require the aircraft to make a landing.
- Article 6:** No scheduled international air service may be operated over or into the territory of a contracting State, except with the special permission or other authorization of that State.
- Article 7:** States have the right to refuse permission to the aircraft of other contracting States to take on in its territory passengers, mail and cargo carried for remuneration or hire and destined for another point within its territory.
- Article 9:** Each contracting State may, for reasons of military necessity or public safety, restrict or prohibit uniformly the aircraft of other States from flying over certain areas of its territory.
- Article 12:** Each state shall keep its own rules of the air as uniform as possible with those established under the convention. The duty to ensure compliance with these rules rests with the contracting state.
- Article 13:** A state's laws and regulations regarding the admission and departure of passengers, crew or cargo from aircraft shall be complied with on arrival, upon departure and whilst within the territory of that state.
- Article 24:** Aircraft flying to, from or across, the territory of a state shall be admitted temporarily free of duty. Fuel, oil, spare parts, regular equipment and aircraft stores retained on board are also exempted from customs duty, inspection fees or similar charges.

"Seventy-five years ago, as World War II still raged, a group of far-sighted individuals met in Chicago and laid the foundations enabling the development of our globally interconnected and interdependent world through aviation," said IATA's Director General and CEO, Alexandre de Juniac, recently.

12,000 provisions

With the Chicago Convention underpinning developments, air traffic management has made enormous strides in the past 75 years.

These range from numerous safety provisions to such operational enhancements as performance-based navigation and are embedded in ICAO's global standards and recommended practices (SARPs), to which each signatory to the Chicago Convention must adhere.

Over 12,000 of these provisions have been developed to further aviation safety, security and environmental protection. Challenges and opportunities brought about by issues in supply and demand, innovative technologies and countless other factors have all been addressed.

Despite this, the continuing relevance of the original 1944 document means just eight changes have been agreed to the original articles, the last covering the use of aircraft as weapons.

This stability can be seen in Article 8 of the Chicago Convention, which deals with "pilotless aircraft". Although it was probably concerned with missiles rather than drones, the wording still remains applicable.

Article 8 states: "No aircraft capable of being flown without a pilot shall be flown without a pilot over the territory of a contracting State without special authorization by that State and in accordance with the terms of such authorization. Each contracting State undertakes to ensure that the flight of such aircraft without a pilot in regions open to civil aircraft shall be so controlled as to obviate danger to civil aircraft."

The article demonstrates that the Chicago Convention remains a broad and flexible multilateral agreement that can accommodate new developments and global policy changes while adhering to the driving principle of aviation as an economic and social enabler.

Open skies

Article 6 of the Chicago Convention says a country needs permission to operate scheduled international air service into the territory of another contracting state.

It smacks of protectionism and would seem to restrict trade and the benefits of aviation from being spread far and wide. But including open skies in the Chicago Convention would have been far too problematic and strayed from the core effort of ensuring safety and reliability in the world's air transport system.

Early agreements reflected the cautious approach and it wasn't until 1992 that open skies entered the industry's vocabulary. In that year, the United States and the Netherlands created a new model for aviation agreements, eliminating the majority of regulatory barriers. The United States today has more than 120 open skies agreements with trading partners around the world, and the liberalized approach is finding its way into many other markets as well.

Today, air navigation service providers are working diligently to integrate drones in civil airspace. U-space solutions are proliferating, and best practice may eventually be cemented in the global aviation system through SARPs.

Global consensus

Arguably, though, the Chicago Convention's biggest contribution to aviation was the delivery of a global consensus – a rare example of effective international cooperation that has ensured 75 years of success.

The global aviation system will continue to progress based on innovation and this spirit of cooperation. The scene has been set for collaboration and growth. Should paradigm shifts in civil aviation force further revisions to the Chicago Convention, doubtless these will be accommodated.

As ICAO describes it: "Aviation unites the world and ICAO must continue to unite aviation." ➔



The flexibility of the Chicago Convention even sets the scene for drones.

Credit: iStock.com/Lexx

The shape of things to come

The wide-ranging submissions for the inaugural CANSO Award of Excellence in ATM demonstrate the value of partnership in ATM.

"Being part of CANSO gives you the unique opportunity to work with global industry leaders, experts and innovators, get unparalleled access to vital industry insights and best practice guidance, and to be part of the decisions that shape your industry," says CANSO's Director General, Simon Hocquard.

"In turn this will help the ATM industry to develop the strategies and approaches needed to tackle key industry issues, evolve day-to-day operations and future capabilities and importantly, to create its own future."

The truth of this statement can be seen in the diversity of submissions for the inaugural CANSO Award of Excellence in ATM. Projects ranged from such big ticket items as new ATM control systems and incorporating drones into civil airspace to everyday operational and safety enhancements. All are integral to driving ATM forward with partnership a crucial factor throughout.



Solutions are being developed for real-time drone tracking, similar to those used for traditional ATM.

Credit: iStock/aerogondo

Partnering for innovation

Collaboration was vital to the implementation of a new ATM control system for Airways, for example. The company needed a piece of technology that could deliver its

future plans for New Zealand airspace with interoperability, resilience and the ability to match capacity with demand in all situations deemed essential.

Leidos was selected as a partner and is now helping to deliver SkyLine-X – a system that allows any sector to be managed from any suite or location, and airspace, sectors or traffic to be transferred seamlessly between two centres as required.

The new system will also provide such capabilities as improved trajectory, time-based flow management, medium-term conflict detection, a terminal sequence and spacing tool and a new modern operator interface. It will also enable full integration of the Oceanic and New Zealand's domestic capability on one system.

Importantly, the submission highlights not only the innovation inherent in new ATC systems but also the value of partnership throughout the aviation value chain.

Despite the challenges of physical distance between their respective headquarters, the organisations have immersed themselves in each other's cultures and ways of working. On a practical level, there are multiple work groups meeting weekly via business conferencing. Airways and Leidos have also established a joint development environment with more than 30 New Zealand-based software engineers and air traffic controllers working with Leidos software engineers in the United States.

CANSO Award of Excellence submissions

AIREON: ADS-B Deployment in the North Atlantic
AIRMAP: Strategic Partnerships for Drone Safety and Enablement
AIRWAYS NEW ZEALAND AND LEIDOS: Skyline-X
ALTITUDE ANGEL: Airspace User Portal
ALTITUDE ANGEL: Operation Zenith
ATNS: Regional CAD Solution
BULATSA: Crisis Performance
CADENA: ATFM Data Exchange
DECEA: ADS-B in the Campos Basin
DECEA: Agile GRU Project
DSNA and SKYGUIDE: Flexible cross-border ANS
EANA: Route Optimisation through CDM
ENAIRE and INDRA: Air Traffic Control Architecture
ENAV, LEONARDO and IDS: Italian U-Space
FAA: Low Altitude Authorisation and Notification Capability
FAA: Terminal Automation and Modernization and Replacement
FAA: Taxiway Arrival Prediction
FREQUENTIS and NATS: Optimising Flight Plan Management
FREQUENTIS, SMART4AVIATION and QANTAS: Route Optimisation Platform
KENYA CAA: Seamless Airspace through SSR Codes
NAV CANADA: RNP at Calgary International Airport
NATS: Day-to-Day Safety Observations
NATS and NAV CANADA: London Terminal Control
NAV PORTUGAL: ATM Reality in Action
SKYGUIDE: Service Oriented Infrastructure
SKYGUIDE and HARRIS ORTHOGON: Virtual Centre

The new SkyLine-X ATM system is on track to become fully operational from Airways' new ATM centres from the middle of 2020, with Oceanic integration operational from the middle of 2021.

Controlling U-space

Drones are another hot topic addressed by the submissions. Incorporating them into civil airspace has occupied many an air navigation service provider (ANSP) recently.

ENAIRe in Spain, Germany's DFS and Swiss ANSP, skyguide, have all been heavily involved in UAS Traffic Management (UTM). There have been many other projects worldwide.

D-Flight, for example, is the Italian industry's response to U-Space, enabling surveillance before and during the drone flight, support to their mission planning, emergency management and flight data recording.

Again, partnership was essential. Leonardo with Telespazio and IDS-Ingegneria Dei Sistemi worked alongside Italian ANSP, ENAV to deliver an initiative that is 60% owned by ENAV and 40% by Leonardo, Telespazio and IDS.

Leonardo is responsible for the system design and for the development of most software services, ensuring adequate security levels based on a security by design approach.

D-Flight will release U-space services progressively, according to a technological roadmap aligned with the European programme. Also, to support operations beyond the visual line (BVLOS), D-Flight will develop solutions for tracking drones in real time, according to surveillance models similar to those already in use for traditional air traffic control.

Optimising flight paths

Partnerships are such an important feature of the air traffic management industry that they can also affect day-to-day operations, turning the ordinary extraordinary.

In 2013, Qantas embarked on a project to replace its aging mainframe-based flight planning system by engaging the University of Sydney, Australian Centre for Field Robotics to research and prototype an innovative path optimiser using probabilistic road map (PRM) techniques.

Qantas then engaged Frequentis and Smart4Aviation to provide the remaining components of the platform, futureproof it and migrate to a cloud environment.

The Constellation system launched in October 2018 and is being used in Qantas' long-haul fleets. Short-haul operations will be added in due course.

This solution provides the technical connection between airlines and ANSPs

for aeronautical information exchange, opening the full scope of aeronautical information publication (AIP) data, and enabling automation of airline flight planning processes.

The more accurate flight plans the system generates lead to enhanced operational safety as well as improved fuel efficiency. It is estimated the Constellation system has delivered a 0.6% reduction in fuel consumption. In addition, the Optimiser has consistently found novel and efficient flight paths, hunting out tailwinds and avoiding strong head winds.

Increased fuel efficiency and proactive en-route response is critical to Qantas's industry challenge to open direct flights Sydney to London and Sydney to New York by 2022.

Demonstrable results

Every other submission for the CANSO Award of Excellence yielded demonstrable results, displaying the extraordinary efforts of air navigation service providers to ensure safer and more efficient skies.

The projects also verified the importance of partnership, with CANSO Members working together, not just within the ATM industry but with industry partners including airlines, airports and regulators. This moved concepts or ideas into action and has built a platform to enhance today's operations and deliver tomorrow's success. ➤



Qantas's Constellation route optimisation platform is consistently delivering novel and fuel-efficient flight paths for the airline's long-haul fleet.

Source: Qantas

Collaborative working in acquisition

In the fourth part of the acquisition excellence series, Adrian Miller, Head of Supply Chain Collaborations, NATS, explores the value found in collaboration.



Credit: NATS

With the relentless growth of air traffic across the globe, aviation increasingly needs technology and solutions to enable it to meet demand safely and efficiently.

Typically, air navigation service providers (ANSPs) cannot do this on their own, so collaboration becomes vital. This may mean working to share costs and requirements for new solutions or working with suppliers of technology and leading-edge services to upgrade operations.

The special relationships that are required for collaboration rely on respect, performance, trust, mutual interest and benefit.

Achieving ideal outcomes

Collaboration is driven by achieving outcomes that cannot always be achieved individually, such as working to:

Deliver better value – with preferential arrangements and cost optimisation, reducing duplication and increasing effectiveness together.

Manage risk jointly – through identifying and assessing potential threats and agreeing appropriate mitigations together and allocating risk to the party best able to manage it.

Innovate – exploring opportunities together to go beyond improvement to find transformational ways of doing things.

Share knowledge – generating improvements and increasing understanding by disclosing and developing what both parties know.

Improve efficiency – streamlining process and practice by removing obstacles and working together to re-engineer them.

Collaborating does not mean being weak and giving in to the other party, as this is a wholly inaccurate assessment of the true nature

There can be no serial “win-lose” outcomes because that simply means that the relationship will not be sustained. If you want to maintain an enduring relationship you must treat it as an important and valuable business resource to be nurtured, developed and invested in through the time and effort of your people.

and genuine potential of a strong collaborative relationship. On the contrary, a collaborative approach seeks to gain the best possible solution for an organisation, albeit acknowledging that the other party must also benefit.

There can be no serial “win-lose” outcomes because that simply means that the relationship will not be sustained. If you want to maintain an enduring relationship you must treat it as an important and valuable business resource to be nurtured, developed and invested in through the time and effort of your people.

In most instances, it requires a change of approach and recognition of the importance of the need to accommodate the other party's needs. The whole premise of collaborative working is that when parties can harness shared objectives, it will be possible to achieve better outcomes together that bring value to both organisations.

Applying collaboration

There are a number of principles that contribute strongly to effective collaboration and maximise the chances of success. A collaborative relationship lacking in these essential ingredients is likely to be beset with some major challenges, or not result in the intended or best possible outcomes.

The International Standards Organisation has published a set of twelve principles (ISO44000), which were developed by international experts responsible for developing and maintaining the ISO standard for Collaboration in Business Relationships (ISO44001). They are:

Relationship Management. To be sustainable, a collaborative relationship should be based on appropriate systems and processes, whether internal or jointly developed. Those collaborative relationships that are based solely on personal relationships, although important, can become vulnerable when personnel changes occur over time. Documenting processes agreed between partners ensures that leadership changes do not weaken the relationship and those joining have a clear perspective of the way the relationship operates.

Visions and Values. Alignment around vision and values provides guidance to stakeholders on behaviours and decisions that facilitate collaboration, over and above metrics, governance and management oversight. It results in smoother operations, faster achievement of goals and higher performance.

Business Objectives. It is only when drivers for collaboration support the business objectives of each participating organisation that a

Fundamental to successful collaboration is ensuring the involvement of people with the right behaviours, competence and skills. Understanding and displaying appropriate collaborative behaviours is a major contributor to ensuring an effective relationship is developed and maintained.

collaborative relationship makes sense. Ensuring each partner's objectives can be achieved through the relationship supports continued and effective engagement at both organisational and individual levels, to sustain mutual benefit.

Collaborative Leadership. A key ingredient for successful business collaboration is the commitment of senior leaders. This contributes strongly to driving the right level of engagement within and across organisational boundaries. This should be allied to ensuring that there is a high level of confidence, promoted at top level, that each organisation is looking out for the interests of their partner.

Governance and Processes. Relationships between organisations require governance structures that support collaborative decision making. Joint management processes will provide clarity for the individuals involved. Collaborative working may require changes to existing working practices and responsibilities, which if not addressed could impact individual performance and confidence, and subsequently the level of engagement and behaviour.

Collaborative Competence and Behaviour. Fundamental to successful collaboration is ensuring the involvement of people with the right behaviours, competence and skills. Understanding and displaying appropriate collaborative behaviours is a major contributor to ensuring an effective relationship is developed and maintained. Behaviour is a strong contributing factor when seeking to build trust with others and getting the most from relationships, developing clear lines of communication and contributing to a heightened level of engagement. Although they are often referred to as soft skills and dismissed as nice to have, in fact the reality is that when they are not present or applied, relationships will be less effective. Even when there are only isolated instances of poor behaviours, this can contribute to damaging the overall relationship.

Trust and Commitment to Mutual Benefit. These are essential for delivering to the full potential of the relationship. To be sustainable over time, organisations need to ensure that the trust in the personal relationships among the individuals working in the collaborative relationship enables them to overcome conflict and adversity. This in turn builds sustainable relationships at an organisational level.

Value Creation. Collaborative arrangements that do not focus on harnessing joint capabilities and knowledge to seek out additional value will dilute their full potential. A significant benefit from working closely with other organisations is the ability to share ideas and develop new opportunities. At the same time, a focus on continual improvement is required to ensure the collaborative organisation benefits from, and adapts to, change.

Information and Knowledge Sharing. The appropriate sharing and management of information and knowledge is part of effective collaboration. A significant value in collaborative working is the



Trust and commitment are essential to unleashing full potential.

Credit: iStock.com/Ridofranz

ability of parties to share knowledge, experience and expertise. Providing clarity and transparency in what needs to be shared and what cannot be shared is also important to achieve the objectives of the relationship, adding value and building trust between partners.

Risk Management. Relationship success can be determined by how threats and opportunities influence individual and organisational behaviours. Attitude to risk can be a significant influence on how people behave. Risk processes should address relationship risk in addition to facilitating joint management of all other risk, by ensuring threats and opportunities are managed and mitigated by those best placed to do so, or by partners working together.

Relationship Measurement and Optimisation. Measuring the health of a relationship is crucial to continually improve its performance and capacity, to create value and deliver on business objectives. Measuring and monitoring the performance of relationships gives early insights to help proactively and collaboratively address issues throughout the life of the relationship.

Exit Strategy. An agreed disengagement strategy can remove uncertainty and enhance joint engagement. Most business relationships will eventually reach an end, either on the planned completion of an activity or beforehand for any reason. Partners and those involved should understand the rules of disengagement early, to inform constructive mutual exit arrangements.

Challenges

For those that want to act collaboratively, a dilemma can arise when others in an organisation want to be competitive and take advantage of a collaborative approach. The right approach with aggressive challengers is to be assertive rather than fall into a fight-or-flight reaction. Make clear that the objective is to build a relationship based on respect, trust and fairness and that an open and honest dialogue facilitates the opportunity to explore mutually beneficial outcomes. If a damaging approach persists, constructively challenge the behaviours.

It is best to show strength while offering an olive branch. ➤



CANSO in Madrid 2020

📍 Madrid, Spain 📅 9-12 March

CANSO brings together a number of high profile events before World ATM Congress and countless networking opportunities over the course of the entire CANSO Madrid Week.

- ✓ 4 days
- ✓ 700 delegates
- ✓ 74% ANSPs
- ✓ 57 countries



CANSO Asia Pacific Conference 2020

📍 Port Moresby, Papua New Guinea 📅 12-15 May

Hosted in one of the world's busiest air transport regions, this is the one event in the year that unites senior ANSP executives, colleagues and suppliers from across the region.

- ✓ 2.5 days
- ✓ 150+ delegates
- ✓ 67% ANSPs
- ✓ 29 countries



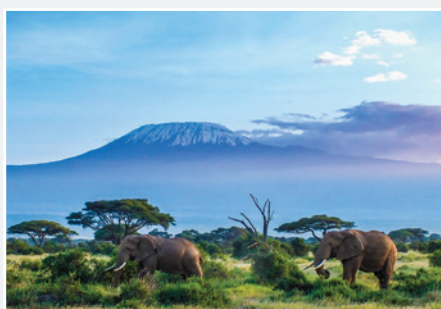
CANSO Global ATM Summit and 24th AGM

📍 Baku, Azerbaijan 📅 9-12 June

CANSO brings together global leaders from across the aviation industry to discuss key contemporary issues and projects.



- ✓ 2.5 days
- ✓ 200+ delegates
- ✓ 64% ANSPs
- ✓ 49 countries



CANSO Africa Conference 2020

📅 August – September

This conference focuses on a rapidly developing region, the diverse challenges and wealth of opportunities.

- ✓ 2.5 days
- ✓ 120+ delegates
- ✓ 67% ANSPs
- ✓ 23 countries



CANSO Latin America and Caribbean Conference 2020

📅 November

This conference offers exciting opportunities for the advance and development of ATM.

- ✓ 2.5 days
- ✓ 100+ delegates
- ✓ 42% ANSPs
- ✓ 22 countries

Designing our future airspace for all users

The skies above us are changing, says Simon Hocquard, CANSO Director General. As more drones, air taxis and commercial spacecraft take flight, safely integrating these new players into our already crowded skies and allowing equitable access to airspace is becoming a key priority.



Credit: CANSO

The air traffic management industry is no stranger to new airspace users. In the past we've welcomed everything from hot air balloons and airships to jet engines and supersonic aircraft into our airspace.

While dealing with new airspace users is not an unprecedented phenomenon, what is new is how they behave. Today's disruptors are innovative, more agile and don't necessarily have the training that traditional airspace users have.

In some cases, they don't even consider themselves to be aircraft operators. We're dealing with unfamiliar mindsets and we need to bridge the gap between ANSPs and these new players.

The first challenge is putting an infrastructure in place that enables their safe operation. That future infrastructure – UAS Traffic Management, UTM, or U-Space – requires greater digitisation, automation, and a faster pace of operations than conventional ATM. Work is underway to determine what UTM will look like but, so far, it's been developed in an uncoordinated fashion with lots of organisations working on it.

Another challenge for ANSPs is figuring out how UTM will work alongside our heritage airspace. Some organisations are embracing

collaboration – a great example being skyguide and AirMap's U-space demonstration which saw dozens of drones manoeuvre safely throughout Switzerland. The two organisations shared live information about the airspace situation and the drones' positioning that enabled the safe and expeditious flow of traffic.

Collaborations like this are the way forward. Not only can we help solve problems together, we can also learn from each other. ANSPs could learn from UAS how to become more nimble and agile. Also, the technology being developed for UTM systems could be used to enhance ATM systems. In turn, we can bring our extensive operational and safety expertise to the unmanned industry.

But it goes beyond just UTM and ANSPs talking to each other, we need to work across industries and across borders to find solutions. ANSPs, regulators, States, airlines, airports, industry suppliers, drone manufacturers and operators must all work together to design our future airspace. And I believe that CANSO has a crucial role to play in this.

Technical experts like ICAO are responding to the advent of new airspace entrants by trying to apply the rules and regulations that apply to heritage airspace. But is that really the right answer? How should we as ANSPs set about designing the future airspace of 2030 and beyond?

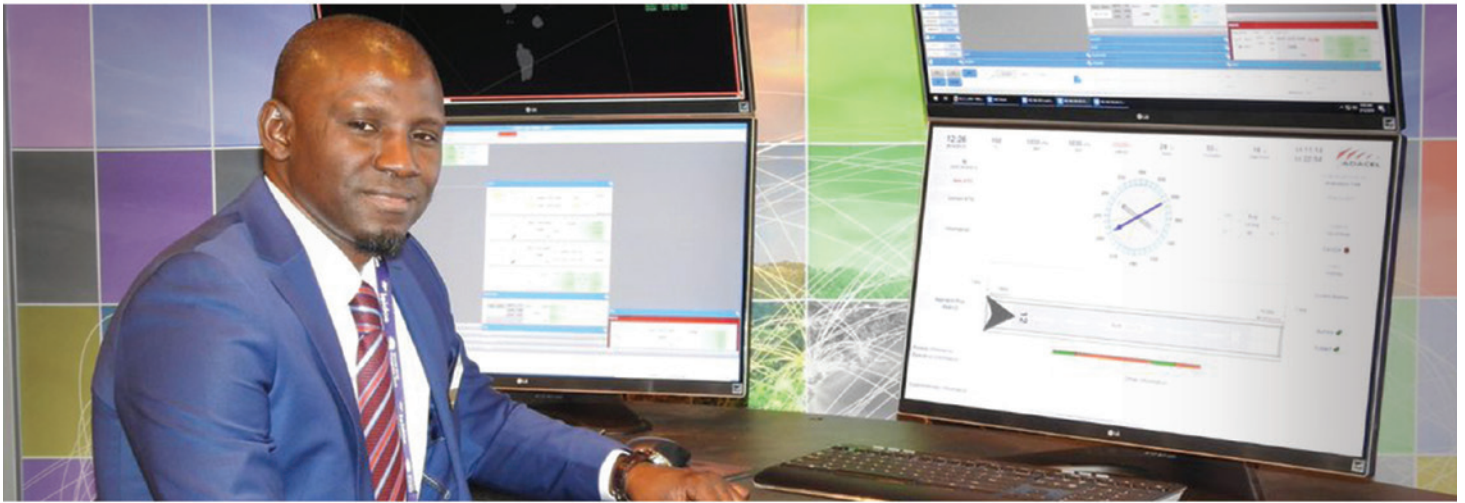
We need to take a proactive role in designing what future airspace looks like. If we don't, we risk being left behind. It's not hard to imagine a world in 10 or 20 years' time where airlines and pilots start looking to UTM to provide a separation service.

In early 2020, I'm planning to pull together a group of experts from across the industry to start developing our thinking in this critical area and I will keep you posted on our progress.

I firmly believe that working in silos creates obstacles, but if we work together across industries, anything's possible. ➔

Today's disruptors are innovative, more agile and don't necessarily have the training that traditional airspace users have...we're dealing with unfamiliar mindsets and we need to bridge the gap between ANSPs and these new players.

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AN AIRBUS COMPANY

Advocating for ATM



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CANSO had a significant presence at ICAO's 40th Triennial Assembly, held from 24 September to 4 October 2019. CANSO submitted four working papers, all of which were ratified with minor comments.

WORKING PAPER 1

Efficiency in Air Traffic Management through Required Navigation Performance

The precise and predictable track containment of required navigation performance authorisation required (RNP AR) procedures has allowed it to evolve from providing improved accessibility to terrain and obstacle-challenged airports to a variety of operational developments, all of which bring safety, environmental and efficiency benefits.

CANSO's paper highlighted those benefits and also identified some key milestones in RNP AR procedure that have allowed it to become a key enabler of the performance-based navigation (PBN) airspace concept. The paper argued that a system-wide strategy of promoting and implementing RNP AR procedures at a multitude of high, medium and low-density airports should therefore be pursued.

CANSO has been a strong advocate for PBN deployment since its inception and released *Accelerating Air Traffic Management Efficiency: A Call to Industry* in 2012. This was followed in 2015 by *Performance Based Navigation Best Practice Guide for Air Navigation Service Providers* (ANSPs) to provide practical guidance on PBN as it applies primarily to terminal airspace environments. In addition, in February 2017 CANSO produced *Performance-Based Navigation for ANSPs: Concept 2030*, which identified current and future PBN-related technologies and services, and potential impediments to successfully implementing PBN.

CANSO continues to work with ICAO regional offices and CANSO members to examine ways of further supporting RNP AR

deployment and in highlighting the benefits that can be achieved in many instances for ATM and aircraft operations, as well as for the environment.

In the paper, CANSO invited the ICAO Assembly to:

- Take note of the information and benefits regarding the implementation of RNP AR;
- Take note that RNP AR will reduce flight distances, fuel burn and CO₂ emissions;
- Take note of recent benefits of the application of new ICAO separation standards incorporated into PANS ATM that are specifically related to RNP AR;
- Recognise the work of CANSO and its Members in introducing RNP AR;
- Instruct ICAO to create implementation guidance material for States on implementing *Established on RNP AR* in Doc 9643 based on the information referenced in the working paper;
- Urge all States to consider introducing RNP AR where applicable based on the expertise of CANSO.

OUTCOME: The Assembly acknowledged the importance of developing RNP AR procedures, where applicable, and recommended that States should consider their use. The Assembly noted that appropriate expert groups were addressing the development of guidance for RNP AR under the existing work programme on the subject.

WORKING PAPER 2

Building Capacity in ATM

Rapid growth in air traffic demand means ATM must modernize globally and regionally. The paper looked at how capacity can be delivered in accordance with ICAO's Global Air Navigation Plan (GANP).

It called for a performance framework that accounts for the interdependencies between investments needed to ensure capacity, the effect of growth on the environment and the potential impact this could have on costs – all bearing in mind the overarching principle of safety.

The paper noted that “planning and delivering optimised airspace capacity is not something that can be done by ANSPs in isolation”. Though a cooperative culture between all stakeholders and regions,

with shared goals, was emphasized, it was also acknowledged that an appropriate legal and regulatory framework was essential.

When setting flight schedules, airspace users and airport operators should engage early with ANSPs, for example, so that the impact on the performance of the overall network can be assessed and potential outcomes understood.

The paper also highlighted the importance of funding. National and regional funding schemes should incentivise transformation so that the accelerated deployment of new technologies that demonstrate a tangible benefit to network performance is duly rewarded. Funding schemes are also essential to major modernisation schemes such as SESAR and NextGen.

In the paper, CANSO invited the ICAO Assembly to:

- Instruct ICAO to further elaborate guidelines and best practices for the design of performance frameworks that include consideration of interdependencies between key performance areas;
- Instruct ICAO to strengthen the inter-regional cooperation between ICAO planning and implementation regional groups (PIRGs) to provide the required support to develop ANS performance enhancements;
- Request States to commit to enhancing collaboration and partnership as aviation recognises and addresses its multidisciplinary challenges ahead;
- Urge States to facilitate the appropriate funding of ATM systems to deliver the capacity needed to meet the expected growth in air traffic.

OUTCOME: The paper was co-signed by ICCAIA and Singapore. The Assembly agreed that States should be urged to enhance collaboration and partnership to address common challenges to facilitate appropriate funding for ATM systems and CNS infrastructure, as well as to ensure that the appropriate financial mechanisms were in place to enable an effective deployment of operational improvements.

What is the ICAO Assembly?

The ICAO Assembly is the organization's sovereign body. It meets at least once every three years and is convened by ICAO's governing body, the Council.

ICAO's 193 Member States and a large number of international organizations are invited to the Assembly to establish ICAO policy for the next three years.

The Assembly reviews ICAO's complete work programme in the technical, economic, legal and technical cooperation fields. Assembly outcomes – voted on by the Member States – are then provided to other ICAO bodies to guide future work, as prescribed in Article 49 of the Convention on International Civil Aviation.

Given that advocacy is one of the key pillars of CANSO's Fit for the Future strategy, some of the CANSO team were in Montreal ensuring that the voice of ATM was heard.



Planning and delivering optimised airspace capacity is not something that can be done by ANSPs in isolation.

Credit: iStock.com/XavierMarchant



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The shared acceptance of common goals and mutual understanding is vital.

WORKING PAPER 3

Ensuring Future Services by Adherence to Key Principles and Mutual Value

The paper noted that ICAO, States, ANSPs and other service providers' are essential to the implementation of the Global Air Navigation Plan (GANP) with the same common objective and collaboration as was evident in the development of the GANP.

It further described CANSO's commitment to advance key ATM initiatives and ensure the effective use of technology to increase ATM capabilities. To achieve these goals, the shared acceptance of common goals and mutual understanding and commitment to the necessary steps is essential.

In the paper, CANSO invited the ICAO Assembly to:

- Urge States to take a collaborative and concerted effort to provide for air navigation for the future in alignment with the GANP;
- Endorse fundamental principles as the bases for the implementation of the GANP;
- Affirm the need to enhance ATM infrastructure while ensuring the interoperability and harmonization of ATM systems to avoid airspace fragmentation; and
- Urge States to support and promote the enhancement of ATM infrastructure, as outlined in the GANP, to ensure the continued provision of safe and efficient service to growing.

OUTCOME: The paper was widely supported by ICAO Member States. Following discussion, a resolution was accepted to supersede Assembly Resolution A39-12.

The resolution:

- Endorses the third edition of the Global Aviation Safety Plan (GASP) and the sixth edition of the Global Air Navigation Plan (GANP) as the global strategic directions for safety and air navigation, respectively;

"The endorsements we received offer a significant boost to the work that CANSO does to contribute to the development of aviation worldwide. They also send a very clear message – CANSO and its industry partners have the support of States and ICAO for a range of measures that will together work to improve the performance of aviation globally and deliver the safe, efficient and sustainable air transport that the flying public deserve. I look forward to working with my industry colleagues on this and building a strong future for airborne mobility."

Simon Hocquard, CANSO Director General

- Resolves that these global plans shall provide the frameworks in which regional, subregional and national implementation plans will be developed and implemented, thus ensuring consistency, harmonisation and coordination of efforts aimed at improving international civil aviation safety, capacity and efficiency;
- Urges Member States, the industry and financing institutions to provide the needed support for the coordinated implementation of the GASP and GANP, avoiding duplication of efforts.

WORKING PAPER 4 Cyber Resilience

Simply, a greater reliance on connected systems presents a bigger cyber risk. The paper called for a more effective response to this growing threat.

It noted that “the current work method of ICAO to address cyber resilience, safety and security-related issues is not sufficiently coordinated and not efficient”.

ICAO action in regard to cyber resilience is evaluated by the ICAO secretariat study group for cyber-Security (SSGC). The lead is with the ICAO Air Transport Bureau (ATB) and supported by the ICAO Air Navigation Bureau (ANB). This results in little governance from States, the Air Navigation Commission (ANC) and the ICAO Council.

The SSGC is unable to propose standards or recommended practices, however, and has no mandate to coordinate the activity of all the panels or working groups related to cybersecurity. It just provides advice.

Given the importance of cybersecurity and the need for quick action, there is a need for a more effective way of addressing the issue. The paper suggested that the SSGC should be upgraded to an ICAO Panel under the ICAO Council and that the newly formed Trust Network Study Group should be placed under this new Panel as a working group.

Creating a multidisciplinary panel on cyber resilience would enhance the coordination and efficiency of investigating and countering related issues in the aviation system.

The paper invited the ICAO Assembly to:

- Recognise the need for a speedy, well governed multi-disciplinary approach to cybersecurity
- Urge the ICAO Council to create a Cyber Resilience, Safety and Security Panel (CRSSP) under governance of the ICAO Council and the Air transport Committee (ATC).
- Urge the ICAO Council to create a working group under the newly formed CRSSP to establish a framework for an aviation trust network.

OUTCOME: The Assembly supported the views expressed in the paper. A resolution promoting a consistent and coherent approach to managing cyber threats and risks and how best to address cybersecurity in civil aviation was adopted.

The aim was to ensure global commitment to action by ICAO, its Member States and industry stakeholders, with a view to collaboratively and systematically addressing cybersecurity in civil aviation and mitigating the associated threats and risks.

CANSO also supported working paper 328 presented by Singapore promoting awareness of AVSEC to other agencies and organisations.

To view the submissions in full please visit:
www.canso.org/40th-icao-assembly



Cybersecurity must be addressed in a collaborative and systemic fashion.

Comprehensive and Integrated Training

Aviation System Block Upgrade (ASBU)

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