

# 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/aerogonco

## 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
- ENAV 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