



PBN/CCO/CDO

Performance-based Navigation (PBN) is the global aviation community’s highest air navigation priority. The PBN concept affords significant benefits including improved safety through more straight-in instrument approaches with vertical guidance, increased airspace capacity, increased airport accessibility, more efficient operations, reduced infrastructure costs, and reduced environmental impact.

Key Component of the ICAO ASBU Strategy

PBN is essential to the implementation of ICAO’s Aviation System Block Upgrade (ASBU) performance improvement areas. For example it provides critical support to the improvement of airport operations through ASBU modules:

- B0-APTA** – Optimization of Approach procedures including vertical guidance
- B1-APTA** – Optimized Airport Accessibility.

And is also a major enabler of the Efficient Flight Path concept through Trajectory-based Operations (TBO). In this capacity, PBN further supports the application of modules which contribute to significant efficiency, capacity and environmental benefits, namely:

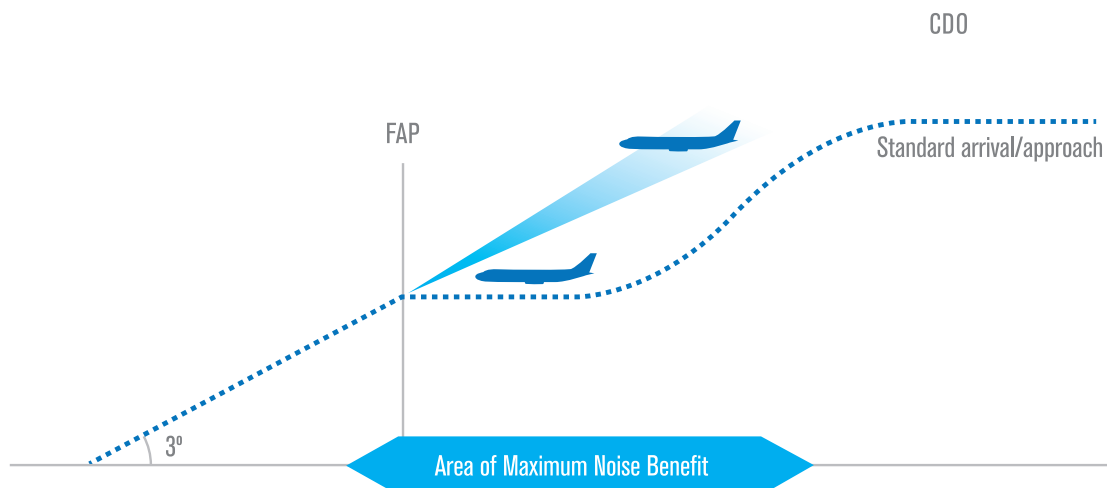
- B0-CDO and B1-CDO** – Continuous Descent Operations (CDOs: see diagram, below)
- B0-CCO** – Continuous Climb Operations (CCOs)

The application of CCO and CDO has led to many environmental benefits in the terminal area. The fact that aircraft can operate without altitude restrictions during departure or arrival phase, and thus optimize their flight profile, results in less noise exposure and reductions in fuel burn and greenhouse gas emissions. Many States have implemented variations of both CDO and CCO.

Enabling important emissions benefits through PBN: The CDO example

CDOs feature optimized profiles that allow aircraft to come in from high altitudes to the airport at minimum thrust settings, decreasing noise in local communities and using up to 30% less fuel than standard ‘stepped’ approaches.

In Dublin Ireland, a form of CDO known as ‘Point Merge’ is currently saving an average of 250 kg of fuel and 750 kg of CO₂ emissions per arrival.





Status of Implementation

Implementation of PBN continues throughout the world. 153 countries have committed to PBN by publishing a State PBN Implementation Plan and the percentage of the world's instrument runways with PBN instrument approaches continue to increase. Many States have also started to redesign en-route and terminal airspace on the basis of the PBN concept.

In Brisbane, Australia for example, the implementation of PBN-based Required Navigation Performance (RNP) procedures resulted in savings of the following over just the first 18 months:

- 125,700 gallons of fuel.
- 1,100 tonnes of CO₂ emissions.
- 17,800 track miles.
- 4300 airborne minutes.

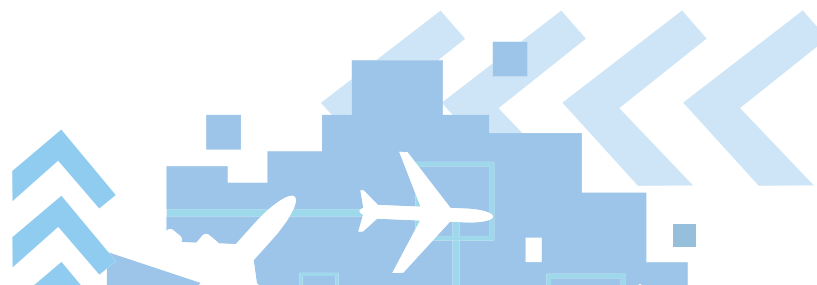
Using the PBN concept in Canada, the redesign of the busy Toronto-Montreal air traffic corridor has enabled:

- Reduced flight time of over 10 hours daily.
- Reduction in GHG emissions by 14,300 metric tonnes.
- Reduced fuel burn by 5.4 million litres annually.

Partners, Tools and Assistance

While the rate of PBN implementation has increased, many States still require assistance with understanding PBN and determining their priorities. ICAO continues to provide support through documentation and guidance material, electronic information kits, online and formal courses, as well as symposiums, regional workshops and on-site visits.

It's also important to note that PBN/CCO/CD0 implementation is highly multidisciplinary, requiring continued coordination and cooperation on related programmes and solutions between ICAO and its key PBN partnering organizations:



ICAO

For more information on ICAO's Performance-based Navigation programme visit:
www.icao.int/safety/PBN

Or contact the ICAO PBN Programme Office via:
pbn@icao.int