



ICAO

International Civil Aviation Organization

Seventh Meeting of the Bay of Bengal Traffic Flow Review Group (BOBTFRG/7)

Video Teleconference, 9 – 11 December 2025

Agenda Item 7: Any Other Business

IMPLEMENTATION OF FREE ROUTE AIRSPACE WITHIN COLOMBO FIR

(Presented by Sri Lanka)

SUMMARY

This paper outlines the implementation plan for establishing Free Route Airspace (FRA) within the Colombo FIR and provides an update on the progress of key initiatives undertaken under the Sri Lanka Air Navigation Plan.

1. INTRODUCTION

1.1 Free route airspace (FRA) is a specified airspace within which users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) significant points, without reference to the ATS route network, subject to airspace availability. Within this airspace, flights remain subject to air traffic control.

1.2 The implementation of FRA within the Colombo FIR is being undertaken in a phased transition in airspace management. Prior to the introduction of full FRA operations, Sri Lanka has planned intermediary stages that allow airspace users to benefit from increasing levels of trajectory flexibility. These precursor steps include the application of User Preferred Routes (UPR) and Direct Routing (DRT) concepts, which enable operators to plan more efficient trajectories within defined parameters.

2. DISCUSSION

Colombo UPR Airspace

2.1 The Colombo UPR airspace was successfully established in 2013 and allows aircraft to select optimal routes from a set of predefined route based on operational preferences such as winds, weather and fuel efficiency. The UPR airspace of the Colombo FIR is laterally bounded by following coordinates:

020000S 0920000E - 020000S 0780000E - 060000N 0780000E - 060000N 0770000E -
070000N 0770000E - 090000N 0793000E - 043000N 0920000E - 020000S 0920000E.

Vertical Limits are from FL245 to FL460.

2.4 RNP 10 capable, ADS-C/ CPDLC equipped aircraft may Flight Plan a User Preferred Route with prior permission at least seven (07) days in advance.

2.5 Colombo UPR Airspace is shown in Figure 1

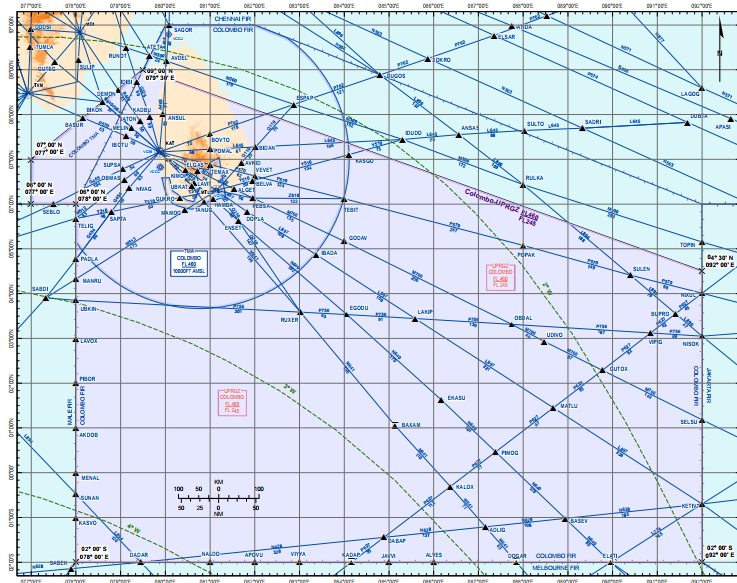


Figure 1 – Colombo UPR Airspace

DRA as a precursor to FRA,

2.6 Direct Routes are established to provide airspace users with greater flexibility in relation to the fixed route network. In addition, the concept allows users to optimize the planning of their flights, aiming at efficiency and managing to reduce fuel consumption and, consequently, the emissions.

2.7 Colombo DRA is planned to be implemented within the Colombo surveillance airspace, covering the Colombo en-route airspace above FL290.

Colombo Surveillance Airspace is an area enclosed by the boundary starting from a point 100000N 080000E thence along straight lines joining the points 100000N 082000E – 082048N 0860758E thence clockwise along an arc of 330 NM radius centered on 070003N 0804618E up to a point 030000N 0843500E thence along straight lines joining the points 030000N 0780000E – 060000N 0780000E – 060000N 0770000E – 070000N 0770000E – 090000N 0793000E thence straight line to the starting point (100000N 080000E), as shown below.

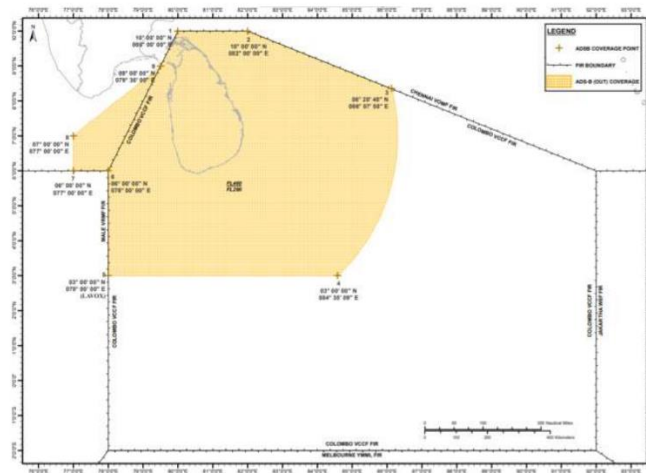


Figure 2 – Colombo Surveillance Airspace
Surveillance Capability and Supporting CNS/ATM Infrastructure

2.8 The introduction of DRA within the Colombo FIR will be supported by comprehensive surveillance and communication capabilities that ensure safe and efficient management of traffic operating on direct trajectories. Air traffic surveillance within the Colombo Surveillance Airspace is provided through Area Surveillance Radar (MSSR) and ADS-B Out, with the MSSR offering coverage up to 240 NM and ADS-B providing extended coverage up to 330 NM from Piduruthalagala (07°00'03"N 080°46'18"E). These surveillance capabilities enable the application of a 5 NM separation minimum for aircraft operating within the surveillance environment, thereby facilitating more flexible routing while maintaining the required safety margins. In addition, Colombo's Oceanic (procedural) airspace is equipped with ADS-C and CPDLC capabilities, ensuring reliable position reporting and controller-pilot communication beyond radar coverage and supporting seamless integration between surveillance-based direct routing and procedural control in oceanic sectors.

Phased approach to implement DRA

2.9 The implementation of DRA within Colombo FIR is being progressed through a structured phased approach to ensure the operational safety. The initial phase focuses on assessing the capability of the existing ground systems to support direct routing operations, including the performance of monitoring functions, safety nets, and other essential ATM tools. This is followed by the systematic identification of potential hazards associated with DRA to ensure that all operational, technical, and human-factors risks are fully recognized. A comprehensive safety assessment is then undertaken to evaluate these hazards and determine the mitigation measures required to maintain an acceptable level of safety. Based on the outcomes of this assessment, an SOP for DRA will be developed to guide the ATCOs and ensure consistent application of procedures. The final phases involves conducting ATC training to enable operational readiness for DRA implementation and publication. At present, Sri Lanka is actively engaged in the first two steps ground system capability assessment and hazard identification as part of its ongoing preparations for implementing DRA by March 2026.

Local FRA Implementation

2.10 Sri Lanka's transition from DRA to FRA is being undertaken as part of its alignment with the ICAO Global Air Navigation Plan (GANP) to modernize air navigation systems and improve airspace efficiency. The Sri Lanka National Air Navigation Plan has identified FRA implementation as

a key initiative under Phase I, demonstrating the State’s commitment to introducing flexible routing within the Colombo FIR in a structured and phased manner.

2.11 To support these operations, Air Traffic Control procedures are updated to accommodate flexible routing, while safety nets and monitoring systems are enhanced to ensure separation and situational awareness for aircraft operating under FRA. Aeronautical information, including updates to the Aeronautical Information Publication (AIP) and NOTAMs, is published to inform airspace users of the new operational environment. Additionally, comprehensive air traffic controller training is conducted to ensure controllers are proficient in managing traffic flows under the Local FRA concept, thereby ensuring safe and effective implementation of free route operations within the FIR.

Continuous monitoring & improvement

2.12 Continuous monitoring and improvement are essential to ensure the safe and efficient operation of FRA. This involves tracking traffic efficiency, safety performance, and environmental impacts, and making necessary adjustments to procedures, entry/exit points, and infrastructure. Ongoing evaluation allows the ANSP to optimize operations, maintain high safety standards, and enhance overall airspace efficiency.

2.13 The effectiveness of FRA implementation will be measured using the following key performance indicators (KPIs).

- (a) Track Mileage Reduction
 - % of flights using FRA vs. fixed routes
 - % of Track miles reduction
- (b) Fuel Burn Savings
 - Avg. kg of fuel saved per sector
- (c) Controller Workload
 - Reduction ATC workload of R/T usage
- (d) Separation assurance
 - No. of losses of separation / incidents
- (e) Flight Efficiency
 - Average time saved per sector

Cross – Border FRA

2.14 Our next Phase, Cross – Border FRA beyond the Colombo FIR to adjacent FIRs, enabling seamless regional flight planning requires coordination with neighboring ANSPs to harmonize procedures and entry/exit points, ensuring safe traffic integration while providing airspace users greater flexibility and ANSPs improved traffic flow management.

3 ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

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