



ICAO

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INFORMATION PAPER

ADS-B/OUT/M — IP/06  
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**Automatic Dependent Surveillance – Broadcast OUT Implementation Meeting for the  
NAM/CAR Regions (ADS-B/OUT/M)  
Ottawa, Canada, 21-23 August 2019**

- Agenda Item 2: Update Status ADS-B Implementation for States**  
**2.2 Update ADS-B Status implementation and regulation development by States**

**CANADIAN ADS-B OUT PERFORMANCE REQUIREMENTS MANDATE**

(Presented by Canada)

<b>EXECUTIVE SUMMARY</b>	
This Information Paper presents an overview of the Canadian mandate for ADS-B Out equipage, approved 28 February 2019.	
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"><li>• Safety</li><li>• Air Navigation Capacity and Efficiency</li></ul>
<i>References:</i>	<ul style="list-style-type: none"><li>• Canadian Aviation Regulations (CARs)</li><li>• Civil Air Navigation Services Commercialization Act (CANSCA)</li><li>• ICAO's recommendation of the RTCA/DO 260B (equivalent to EUROCAE/ED-102A)</li></ul>

**1. Introduction**

1.1 NAV CANADA is the authority responsible for the management and operation of the Canadian Air Navigation System (ANS). NAV CANADA provides the necessary services for the safe, expeditious, orderly and efficient movement of air traffic within Canadian Airspace.

1.2 Canadian airspace includes 18 million square kilometres of domestic and oceanic airspace, much of which remains without surveillance and is controlled with less efficient procedural airspace rules.

1.3 The availability of space-based reception of ADS-B as an ATS surveillance source presents an opportunity to expand surveillance coverage and enhance safety while increasing operational efficiency.

1.4 An environment in which aircraft meet an ADS-B Out performance requirement would maintain or enhance safety, result in greater capacity and efficiency in Air Navigation Services (ANS), and provide a flexible, expandable platform to accommodate future traffic growth while avoiding possible system delays and limitations in service.

1.5 The safety benefits of utilizing space-based ADS-B for surveillance through the performance requirements mandate include increased ATC situational awareness through improved accuracy of aircraft position and trajectory, earlier warnings/alerts of unexpected aircraft deviations, implementation of common surveillance technology to current and new airspace for a more seamless operating environment and improved emergency response for tracking and locating aircraft in distress.

1.6 NAV CANADA is specifying minimum performance requirements for all automatic dependent surveillance – broadcast (ADS- B) OUT equipped aircraft to operate in certain designated airspace to support 5 NM separation standards.

1.7 To apply consistent separation standards for improved safety and efficiency in a volume of airspace, all aircraft must be appropriately equipped with ADS-B Out. NAV CANADA determined that it would not be operationally feasible to assign different performance requirements dependent on the nature of the operation, nor would it be effective to require both pilots and controllers to verify specific performance parameters before any given operation or change of airspace.

## **2. DEVELOPMENT OF THE MANDATE**

2.1 The mandate for ADS-B Out performance requirements was developed in accordance with the Aeronautical Study process as defined in Canadian Aviation Regulations (CARs) and the Civil Air Navigation Services Commercialization Act (CANSCA). The Aeronautical Study was conducted by NAV CANADA, in consultation with various domestic and international aviation stakeholders.

2.2 Transport Canada, the ANSP regulator, granted concurrence with the Aeronautical Study on February 28, 2019, enabling the implementation of the mandate.

## **3. PERFORMANCE REQUIREMENTS**

3.1 The performance requirements align with ICAO's recommendation of the RTCA/DO-260B (equivalent to EUROCAE/ED-102A), Minimum Operational Performance Standards for 1090 MHz ADS-B as the preferred standard.

3.2 Performance requirements for ADS-B Out mandated airspace allow for DO-260, DO-260A and DO-260B or equivalent prior to the retrofit date of 1 January 2024; thereafter, DO-260B will be required.

3.3 In much of the mandated airspace, space-based ADS-B Out system will be the primary source of surveillance. Operators will require antenna diversity to achieve the standard for probability of update.

#### 4. IMPLEMENTATION: AIRSPACE AND TIMELINE

4.1 Phase 1: Effective January 01, 2021, notwithstanding retrofit allowances and exemptions, the specified performance requirements will be applicable in all Canadian Class A airspace, which consists of the Southern, Northern and Arctic Control Areas from 18,000' and above, FL230 and above and FL270 and above respectively, as well as in all Class E airspace above FL600, as illustrated in Figure 1.

*Note: This paper uses simplified generalizations for airspace classification and boundaries. Canadian airspace classification and airspace boundaries are explicitly defined in the Transport Canada Designated Airspace Handbook (DAH), Publication TP1820.*



Figure 1. Canadian Class A Airspace

4.2 Phase 2: Effective January 01, 2022, notwithstanding retrofit allowances and exemptions, the specified performance requirements will be applicable in all Canadian Class B airspace, which is all low level controlled airspace above 12,500' ASL or from the Minimum Enroute Altitude (MEA), whichever is higher, to below 18000' ASL.

4.3 Phase 3: The specified performance requirements may become applicable in Canadian Class C, D and E controls zones or in other class E airspace, Terminal, or Transition Areas. Each class of airspace will be considered on a case-by-case basis following additional stakeholder consultations. Effective dates will be no sooner than January 01, 2023.

## **5. CONCLUSIONS**

5.1 The mandate supports the requirements and timelines for initiatives to modernize ATS surveillance and will support seamless ATS surveillance between continental and oceanic regions.

5.2 The mandate meets the Transport Canada Performance-Based Navigation (PBN) Operations State Plan, which stated that planning should take place for the mandatory use of ADS-B in designated airspace between 2018 and 2022. It also aligns with ICAO navigation and surveillance plans and recommended practices.

5.3 Details of the performance requirements, impacted airspace and timelines will be available online through the NAV CANADA website under Level of Service.