

Submission: 139

The Boeing Company



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The Boeing Company

October 22, 2025

W-ESMC-REG-25-KC-47

Australian Government Department of Infrastructure, Transport, Regional Development,
Communications, Sport and the Arts

Subject: Boeing Comments to Australian Government Department of Infrastructure, Transport,
Regional Development, Communications, Sport and the Arts: Potential future expansion of
Automatic Dependent Surveillance Broadcast (ADS-B) mandate in Australia

Dear Madam or Sir,

The Boeing Company appreciates the opportunity to review and provide comments on the
Australian Government Department of Infrastructure, Transport, Regional Development,
Communications, Sport and the Arts: Potential future expansion of Automatic Dependent
Surveillance Broadcast (ADS-B) mandate in Australia. We have reviewed the document and are
providing comments with details of our recommended revisions.

Thank you for your consideration of our input.

Sincerely,

A handwritten signature in black ink that reads 'Kara Charles' in a cursive, flowing script.

Kara Charles
Director, Regulatory Issues Management
Safety, Security & Airworthiness

**The Boeing Company Comments to
Australian Government Department of Infrastructure, Transport, Regional
Development, Communications, Sport and the Arts: Potential future expansion of
Automatic Dependent Surveillance Broadcast (ADS-B) mandate in Australia**

COMMENT #1 of 9			
Type of Comment (check one)	Non-Concur	Substantive X	Editorial
Page number and paragraph of the proposed document that is of concern.	<p>References to the concept “alerted see and avoid” in the following areas.</p> <p>Page: 8 Para: 1.2, Diagram</p> <p>Page: 20 Para: 5.1 “<i>In effect, ADS-B turns the ‘see and avoid’ concept into ‘alerted see and avoid’.</i>”</p>		
What is the proposed requirement or text?	<p>The diagram and the paragraph distill the updated operational concept to “<i>alerted see and avoid</i>”.</p>		
What about this proposed requirement do we want changed?	<p>We recommend revising the updated operational concept to “<i>alerted see and avoid / <u>detect and avoid</u></i>”.</p>		
Why is the change justified?	<p>The concepts “<i>see and avoid</i>” and “<i>alerted see and avoid</i>” imply visual acquisition of the traffic aircraft by a human operator. While the visual acquisition task can be performed by a flight crew on a manned aircraft or a remote flight crew on an unmanned aircraft, the updated concept should also be inclusive of fully unmanned autonomous aircraft. “<i>Alerted see and avoid</i>” along with “<i>detect and avoid</i>” based on ADS-B technologies would provide adequate coverage for future airspace users as well as supporting crewed operations to overcome human visual limitations.</p>		

COMMENT #2 of 9			
Type of Comment (check one)	Non-Concur X	Substantive	Editorial
Page number and paragraph of the proposed document that is of concern.	<p>Implications of crew alerting requirements in ADS-B IN application(s) in the following area:</p> <p>Page: 8 Para: 1.2, Diagram – “<i>alerted see and avoid</i>”</p> <p>Implications of situational awareness requirements in ADS-B IN application(s) in the following area:</p> <p>Page: 17 Para: 2.2 “<i>ADS-B IN would be a commitment to an operator’s own safety by enabling them to see other aircraft...</i>”</p> <p>References to ADS-B IN mandate without specific requirements in the following areas:</p> <p>Page: 34 Para.: 6.1.2</p> <p>Page: 35 Para.: 6.2</p> <p>Page: 36 Para.: 6.3.1</p>		
What is the proposed requirement or text?	<p>The areas identified above do not specify the type(s) of ADS-B IN application that will be mandated in Australia.</p>		
What about this proposed requirement do we want changed?	<p>We recommend that the ADS-B IN rule identifies the application(s) to be implemented, and the features required for each application. For example, does “<i>alerted</i>” mean that the ADS-B IN applications will require an alerting component? Does “<i>see</i>” mean that a traffic situation awareness only ADS-B IN application will be sufficient? Will seeing and/or alerting be required for both airborne and surface traffic? Will TA/RA alerting be based on ADS-B In and not only TCAS?</p>		
Why is the change justified?	<p>ADS-B IN is an enabler to applications that will reduce the risk of mid-air and surface collisions. Some are limited to only graphically depicting vicinity traffic position and state (e.g., AIRB) while others also include conflict alerting capability (e.g., ATAS, SURF-IA, and Apollonius). Yet other applications can provide conflict alerting without requiring a graphical traffic display (e.g., Class 1 ATS and SURF-A). It would not be possible for airframe manufacturers to comply with an ADS-B IN mandate without specifying the types of ADS-B IN application(s), features within the human machine interface as well as other requirements such as cybersecurity (e.g., mitigations for spoofing and jamming).</p>		

COMMENT #3 of 9			
Type of Comment (check one)	Non-Concur X	Substantive	Editorial
Page number and paragraph of the proposed document that is of concern.	Page: 9 Para: 1.3, VFR Page: 33 Para: 6.1 VFR Aircraft / Figure 10 Potential Model for VFR Aircraft		
What is the proposed requirement or text?	The proposed text on page 9 states: <i>The working group has proposed ADS-B IN capability using a suitable receiver be required from 2028 for all capable aircraft operating under VFR.</i> Figure 10 on page 33 shows that ADS-B IN will be required on all VFR aircraft at the end of 2028.		
What about this proposed requirement do we want changed?	We recommend revising the text and the figure to change the ADS-B IN compliance date to the end of 2033 for air transports operating under VFR.		
Why is the change justified?	Although air transports operate predominantly under IFR, some do operate under VFR. Specifying an end of 2033 compliance date for air transports operating under VFR would be consistent with the compliance date for all aircraft operating under IFR on page 35 in para. 6.2 / Figure 11.		
COMMENT #4 of 9			
Type of Comment (check one)	Non-Concur	Substantive X	Editorial
Page number and paragraph of the proposed document that is of concern.	Page: 17 Para: 2.2, ADS-B IN		
What is the proposed requirement or text?	The proposed text states: <i>"The received ADS-B OUT data is then displayed for pilot reference, as a fixed display on the instrument panel or via a portable tablet or electronic flight bag (EFB), or ..."</i>		
What about this proposed requirement do we want changed?	We request clarification on whether internet-based traffic on a portable tablet or an EFB will comply with the ADS-B IN mandate.		
Why is the change justified?	Some tablet or EFB traffic awareness applications show internet-based traffic instead of receiving ADS-B OUT messages directly from vicinity traffic. The former implementation has potential latency concerns. This will be important to help determine mandate compliance of solution candidates.		

COMMENT #5 of 9			
Type of Comment (check one)	Non-Concur	Substantive X	Editorial
Page number and paragraph of the proposed document that is of concern.	Page: 17 Para: 2.2, ADS-B IN		
What is the proposed requirement or text?	The proposed text states: <i>"In addition to assisting in aircraft separation, ADS-B IN can be used for advanced functionality, such as enabling two aircraft to follow each other directly (called in-trail procedures), or ..."</i>		
What about this proposed requirement do we want changed?	We recommend revising the text as follows: <i>"In addition to assisting in aircraft separation, ADS-B IN can be used for advanced functionality, such as enabling two aircraft to follow each other directly (called in-trail procedures) <u>an aircraft to directly manage its spacing relative to another aircraft (called Interval Management)</u>, or ..."</i>		
Why is the change justified?	The text incorrectly describes the In-Trail Procedure application and was likely trying to refer to the Interval Management application. This change increases the technical accuracy of the language.		
COMMENT #6 of 9			
Type of Comment (check one)	Non-Concur	Substantive X	Editorial
Page number and paragraph of the proposed document that is of concern.	Page: 19 Para: 4, International Introduction of ADS-B Technology Page: 45 Appendix B, ADS-B on UAT (978 MHz)		
What is the proposed requirement or text?	The text mentions forward-looking efforts such as EASA U-space, NAV CANADA use of space-based ADS-B, and FAA BVLOS ARC. The text did not mention UK CAA's Electronic Conspicuity Initial Technical Concepts of Operations. Appendix B states that: <i>"Within Australia, UAT is not implemented and there are no UAT re-broadcast services."</i>		
What about this proposed requirement do we want changed?	We recommend that the ADS-B IN mandate clearly states that it supports both ES 1090 MHz and UAT 978 MHz. A structured trade study with clearly weighted criteria should be conducted to determine the suitability of a single link or a dual link strategy in Australia.		

Why is the change justified?	Many current commercially available devices already support both standards. Adding all future airspace users to 1090 MHz will place undue burden on the spectrum.		
COMMENT #7 of 9			
Type of Comment (check one)	Non-Concur	Substantive	Editorial X
Page number and paragraph of the proposed document that is of concern.	Page: 22 Para: 5.1.2, Mid-air Collision between Crewed and Uncrewed Aircraft		
What is the proposed requirement or text?	The proposed text states: "Accordingly, the risk of mid-air collision between crewed aircraft and uncrewed aircraft will increase."		
What about this proposed requirement do we want changed?	We recommend revising the text as follows: "Accordingly, the risk of mid-air collision between crewed aircraft and uncrewed aircraft will <u>has the potential to</u> increase."		
Why is the change justified?	The multi-layered safety case approach required multiple barriers addressing the mid-air collision risk. An increase in mid-air collision between crewed aircraft and uncrewed aircraft is not supported by evidence given that routine BVLOS operations have been undertaken for many years in Australia. The risk can be further addressed and reduced through the introduction of an ADS-B Out expansion/ADS-B In mandate.		
COMMENT #8 of 9			
Type of Comment (check one)	Non-Concur	Substantive X	Editorial
Page number and paragraph of the proposed document that is of concern.	Page: 31 Para: 5.5.2, Beyond Visual Line of Sight (BVLOS) Drone Operations		
What is the proposed requirement or text?	The proposed text states: "CASA has not yet been able to approve a complex BVLOS drone operation in ARC-c22 or ARC-d airspace, which is in part because operators do not currently have practical pathways to see and avoid the majority of airspace users"		
What about this proposed requirement do we want changed?	We recommend providing additional context for this statement.		
Why is the change justified?	There is a need for CASA to establish guidance around SAIL IV and higher to support the approval process. Suitable DAA solutions do exist but have been delayed in deployment due to SAIL IV and higher approval requirements, many of which are not related to air risk. ADS-B Out		



	expansion/ADS-B In mandate will help but not solve all the high SAIL approval challenges.		
COMMENT #9 of 9			
Type of Comment (check one)	Non-Concur	Substantive X	Editorial
Page number and paragraph of the proposed document that is of concern.	Page: 33 Para: Potential Model in Context		
What is the proposed requirement or text?	The proposed model does not mention a potential extension of the rebate program.		
What about this proposed requirement do we want changed?	We recommend adding a statement describing any potential extension of the rebate program and the lack of restrictions to equip earlier than the mandate timeline.		
Why is the change justified?	Extension of the rebate program beyond 2027 would be an excellent means to promote the early adoption of ADS-B IN applications.		