



Airborne Delegation

Forecasts for traffic growth in Europe and the United States over the next several decades suggest that solely improving ground systems will likely come at a high cost to achieve the required capacity and provision of services. The development of a close cooperation between ground and airborne systems, the use of new procedures, and the shifting of roles and responsibilities across system participants provide several avenues to meet this challenge. One promising option is airborne delegation—a procedure that temporarily delegates separation responsibility from ground air traffic control to the cockpit under specific conditions.

Recent research by The MITRE Corporation's Center for Advanced Aviation System Development (MITRE/CAASD) recognizes the potential value of airborne delegation as a distributed means of providing flexible alternative solutions for future National Airspace System (NAS) operations that leverages evolving avionics and surveillance technology. Concurrently, the research also recognizes the value in maintaining an overall centralized picture for efficient planning and control of operations, mainly those during peaks in traffic demand.

Similar to the current visual separation application, the Controller-Assigned Airborne Separation (CAAS) concept relies on certified airborne components aboard the maneuvering aircraft to perform “electronic” visual separation. Specifically, to achieve separation it identifies a target aircraft and generates headings. CAAS enables a controller to authorize such an equipped aircraft to achieve and maintain separation from the designated target aircraft. The delegation of responsibility is temporary and specific to the encounter. The controller would continue to provide separation from all other traffic and any other hazards. Once the flight crew accepts the CAAS-based clearance to avoid the other aircraft, they accept responsibility for separation for that operation. CAAS imposes requirements for both the airborne

components and the ground-based automation system, including display inputs/outputs for both, and detailed procedures for initiating, completing, and terminating a given CAAS operation. However, the benefits potentially include a reduced tactical workload for the controller. This leads to improved system scalability and enhanced safety through increased situational awareness and direct cockpit participation in separation decisions.

Concept Exploration studies of the CAAS concept for a pairwise crossing application and more strategic airborne separation have been conducted by CAASD. Both CAAS concepts were explored in laboratory evaluations involving controller and pilot participants. While additional research remains, these early evaluations of airborne delegation concepts produced encouraging results. The concepts show promise to be both operationally feasible and to deliver benefits to the NAS.

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