

Summary

The pilots “felt naked without [TCAS] when the evaluation was over.”

— United Airlines, Summary User Evaluation Report

The compliance deadline established in Public Law 100-223 for implementing the Traffic Alert and Collision Avoidance System (TCAS II) has safety, economic, and international consequences not fully foreseen at the time of enactment. The TCAS II program is unique in the combination of technological complexity, rapid introduction, and the number of aircraft affected. **OTA finds that aviation safety will be best served by introducing TCAS II on commercial aircraft as soon as possible, by requiring a phased implementation schedule, and by providing for a structured evaluation program carried out jointly by industry and the Federal Aviation Administration (FAA) to oversee the first year of operation.**

While evaluations to date have indicated that TCAS II works quite well, no more than two TCAS II equipped commercial aircraft have flown at any given time. The reactions and interactions of pilots, controllers, and TCAS II within the air traffic system cannot be understood until large numbers of aircraft equipped with TCAS are in operation. **OTA concludes that to ensure full safety benefits, a critical number of aircraft must be outfitted with TCAS II at an early date – possibly 15 to 30 percent (600 to 1,200 aircraft) of the commercial fleet by December 1990. Industry and FAA will need to cooperate in an evaluation that covers the spectrum of aircraft and airspace types and allocates sufficient resources for collecting, analyzing, and disseminating data.**

Public Law 100-223 requires that airlines meet a December 30, 1991, installation deadline for TCAS II. This will strain the resources of virtually every participating aviation organization. Manufacturers must produce and deliver equipment, airlines and others must redesign and modify aircraft, and FAA must certify equipment and altered aircraft. While many major airlines can probably meet the deadline, other critical maintenance and modification programs are likely to suffer. Airlines will have to remove about one-half of their fleets from scheduled service for at least a few days to install TCAS II. Faced with limited numbers of skilled technicians and engineering and maintenance resources, airlines plan to contract out TCAS II work, use overtime, cut discretionary maintenance, and petition for exemptions from other maintenance requirements, such as inspection and modification of aging aircraft. Development is still

incomplete for some TCAS II display options, ground test equipment, and technology suitable for commuter aircraft, compounding the uncertainties surrounding installation time.

Out-of-service time for aircraft raises equity issues separate from the direct costs of installing TCAS II. Airlines without extra aircraft are likely to lose passengers to other airlines for a short time, whereas companies with more resources can avoid canceling service. Airlines that fail to meet the deadline will be penalized severely if unequipped aircraft are not permitted to fly in U.S. airspace in **1992**. **However**, airlines that complete TCAS II installations on time will face indirect cost penalties if their competitors do not commit similar resources and are granted extensions.

Although OTA finds no reason to delay initial TCAS II implementation, sufficient airline resource limitations, economic inequities, and international implications stem from the present deadline for Congress to consider extending the installation schedule. If an extension is enacted, specific requirements in the same law will be needed to ensure that installation of TCAS II begins promptly after production equipment is available and proceeds at a reasonable pace over the span of any extension. Prompt congressional consideration of any change to Public Law 100-223 is also important. Indeed, the forcing effect of legislation is likely to be necessary to ensure maximum safety benefits as early as possible and to allow airlines to make appropriate plans for investments in personnel and equipment. Although requiring and linking an operational evaluation program, a phased compliance schedule, and an extended deadline places additional responsibilities on each affected party, this approach spreads economic burdens more equitably than other possible options and provides maximum safety benefits.