Deferred TCAS

The Aviation Safety Information Analysis and Sharing (ASIAS) program conducted an analysis of traffic alert and collision avoidance system (TCAS) alerts based on an industry briefing. Although an approved minimum equipment list (MEL) allows an aircraft to operate with a deferred TCAS, it may significantly increase the risk of a mid-air collision based on the nature of the operation. When the system is inoperative, the flightcrew loses the automated protection of resolution advisories (RA), requiring them to rely on less precise methods for separation and significantly increasing their workload.

Operational Consequences

Absence of RAs
Without a functioning TCAS, the aircraft cannot generate RAs, which are automated vertical commands (for example, "CLIMB," "DESCEND"), to avoid a collision. This is TCAS' most critical function and its loss removes a key safety layer. TCAS II aircraft with the RA capability must now deal with uncoordinated RAs when encountering aircraft operating without that capability, increasing the workload of all aircraft and reducing safety within that volume of airspace. The push-down RA is one such example.

Reduced Traffic Awareness (TA-only Mode)
Depending on the specific deferral, the system may still operate in traffic advisory (TA)-only mode. This provides an alert warning that another aircraft is in the vicinity, but it offers no automated avoidance instructions. The pilot must visually acquire the traffic and take manual action based on air traffic control (ATC) instructions—a slower, less reliable method.

Increased Pilot Workload and Distraction
In high-density airspace, pilots must dedicate more attention to visually scanning traffic and coordinating with ATC. This increased workload can lead to missed radio calls or other errors, as demonstrated in a National Aeronautics and Space Administration (NASA) Aviation Safety Reporting System (ASRS) report, where pilots were distracted by TA alerts and missed instructions.

ATC Limitations
After a TCAS RA, ATC is not responsible for providing approved separation until the aircraft has returned to its assigned altitude, completes the maneuver, or is given alternate instructions and approved separation exists. When a TCAS is deferred, pilots must rely more heavily on ATC for separation, but the controller cannot see the traffic picture exactly as the pilot would. Operating an aircraft with a deferred TCAS or in TA-only mode not only increases the flightcrew's workload in the deferred aircraft, but also imposes extra safety responsibility and increased workload on the flightcrews of surrounding aircraft.

Dependence on Other Aircraft
TCAS' effectiveness depends on other aircraft's transponder functionality. When an aircraft's TCAS is deferred, its ability to sense and coordinate with other traffic is compromised. The pilot must assume the other aircraft's TCAS is working correctly and will respond appropriately to avoid a collision.

A Quick Poll
A quick poll of several major U.S. Title 14, Code of Federal Regulations (14 CFR) part 121 air carriers revealed some will not defer TCAS, some will only defer for one leg to a repair station, some will defer for 1 day and a maximum of three legs, and some still defer for the allowable 3-day MEL limit.

Recommended Practices

Stay Alert
Pilots operating in and out of high-risk locations must remain aware that visual flight rules (VFR) traffic may be active in the area.

Include VFR Traffic in Your TEM
VFR traffic should be a standard part of your Threat and Error Management (TEM) briefing, especially at high-risk locations.

Monitor ATC Closely
Listen carefully to ATC, comply with clearances, and be prepared for sudden changes, especially in congested airspace.

Use All Available Tools
Don't rely solely on traffic calls—use every resource to see and avoid other aircraft.

Understand Radar Limitations
Being on radar vectors does not guarantee ATC sees nearby VFR traffic—especially those not squawking and flying near Class B/C boundaries.

Know Your TCAS Limits
TCAS may not alert you to nearby traffic at low altitudes. Check your fleet-specific Flight Manual for TCAS inhibit details.

Take the Threat Seriously
The risk is real, it's increasing, and currently, mitigation may not always be enough to see and avoid other aircraft. Pilots are the final decision-makers on whether to accept an aircraft with a deferral or whether to operate in TA-only mode. Pilots have both the authority and the obligation to make the final safety decision—even if the deferral is technically legal under the MEL.

Take special precautions when operating with a deferred TCAS system at the locations below where data has identified increased TCAS RA activity: AFW, SoCal (VNY, BUR), LAS, TUS, Washington D.C. (DCA, IAD, BWI), the Northeast (BOS, TEB), and parts of Florida.

Procedural and Flight Plan Changes
Operating with a deferred TCAS may necessitate adjusting the flight plan suffix to accurately reflect the aircraft's equipment status. Failure to do so can create confusion for ATC and other airspace users.