

Do Your Takeoff Homework; Runway Length Matters

Understanding the Potential Hazards of Intersection Takeoffs

The problem

- Typically used to save time, intersection takeoffs are a common practice in aviation, especially in general aviation operations. However, pilots may not fully understand the potential risks associated with conducting intersection takeoffs.
- If an aircraft experiences a problem while conducting an intersection takeoff, the available runway remaining to abort the takeoff or perform an emergency landing is reduced or eliminated, resulting in greater risk of injury or aircraft damage.

Related accidents

The National Transportation Safety Board (NTSB) has investigated several accidents involving pilots who were conducting intersection takeoffs, including the following:

- Instead of using the full runway length of 6,179 ft for takeoff, the pilot of a Monnett Sonex experimental amateur-built airplane chose to conduct an intersection takeoff with about 2,570 ft of available runway. Shortly after takeoff, the airplane lost engine power and impacted parked vehicles near the departure end of the runway during the pilot's attempt to turn back for an emergency landing (figure 1 shows the airplane's takeoff and flightpath). Had the pilot used the entire runway for takeoff, there likely would have been sufficient available runway remaining to land the airplane following the loss of engine power. ([CEN15FA249](#))



Figure 1. Map showing Monnett Sonex airplane's flightpath

■ A sport pilot of a Luscombe 8A and his flight instructor initiated takeoff from a runway intersection, eliminating nearly 700 ft of usable runway. About 100 ft above the runway, the engine lost partial power. With insufficient runway remaining on which to land and obstacles at the end of the runway that made a straight-ahead, off-airport landing hazardous, the flight instructor attempted to maneuver toward the ramp area adjacent to the runway. The airplane experienced an aerodynamic stall, impacted the runway in a nose-down attitude, and came to rest inverted (figure 2 shows the main wreckage). In addition, the airplane was 68 pounds over its maximum gross weight and density altitude was over 2,000 ft, which affected the airplane's performance. The flight instructor sustained serious injuries and the sport pilot sustained fatal injuries. ([ERA12FA491](#))



Figure 2. Main wreckage of Luscombe 8A

■ For schedule expedience, the pilot of a Piper PA-32 airplane, operated as a 14 *Code of Federal Regulations Part 135* flight, chose to conduct an intersection takeoff using 5,550 ft of an 8,700-ft-long runway (figure 3 shows an overview of the runway environment). After takeoff, the airplane experienced a partial loss of engine power. The airplane stalled at a low altitude during the pilot's attempt to return to the runway and impacted airport property. One passenger died, five sustained serious injuries, and one person sustained minor injuries. Based on the accident flightpath, the additional 3,150 ft of runway likely would have been sufficient to enable a straight-ahead landing on the runway after the power loss rather than a turnback. ([WPR13LA045](#))

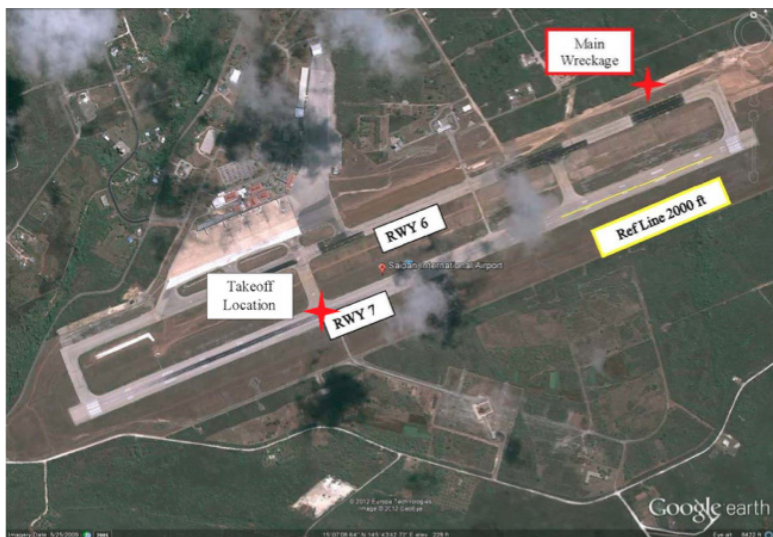


Figure 3. Runway overview

What can **YOU** do?

- **Allow adequate time for preflight preparations and taxiing to eliminate time pressure to conduct an intersection takeoff.**
- **Do your homework. Know your aircraft's takeoff and landing performance limitations based on gross weight, density altitude, and other considerations in the event of a malfunction that would require an aborted takeoff or emergency landing.**
- **Communicate the plan. Ensure your pretakeoff briefing to yourself and/or your crew addresses potential emergency situations.**
- **If you do perform an intersection takeoff, clearly communicate your intention to conduct an intersection takeoff, your position, and planned departure, via local air traffic control procedures to alert potential conflicting traffic.**
- **Do not feel obligated to accept an intersection takeoff if it is offered to you by air traffic control.**
- **For most takeoffs, use all available runway length to increase your margin of safety. Recognize that using anything less than the full length of the runway is accepting a higher level of risk.**
- **In the event you need to return to the airport or runway, remember that an aerodynamic stall can occur at any airspeed, at any attitude, and with any engine power setting.**





Interested in more information?

- The FAA's "[Airplane Flying Handbook](#)" (FAH-H-8083-3B), chapter 5, "[Takeoffs and Departure Climbs](#)," provides guidance regarding proper takeoff procedures. Takeoffs may seem simple but often present the most hazards of any phase of flight.
- The FAA's "[Pilot's Handbook of Aeronautical Knowledge](#)" (FAA-H-8083-25B), chapter 2, "[Aeronautical Decision-Making](#)," provides pilots a systematic approach to determine the best course of action in response to a given set of circumstances.
- [An article](#) in the July 2004 issue of *Flight Training Magazine*, an Aircraft Owners and Pilots Association publication, discusses the importance of alerting potentially conflicting traffic of the intent to conduct an intersection takeoff.
- NTSB report [AAR-08/03/SUM](#) discusses a 2006 fatal accident in which a de Havilland DHC-6-100 being operated as a local parachute operation flight lost power in the right engine shortly after an intersection takeoff.

A companion [video](#) to this safety alert can be accessed from the [Aviation Safety Alerts](#) link.

The reports for the accidents referenced in this safety alert are accessible by NTSB accident number from the [Aviation Accident Database](#) link, and each accident's public docket is accessible from the [Accident Dockets](#) link for the Docket Management System. Safety Alert [Prevent Aerodynamic Stalls at Low Altitude \(SA-019\)](#) can be accessed from the [Aviation Safety Alerts](#) link.

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