



**NTSB**

# ***SAFETY ALERT***

National Transportation Safety Board



## **Stay Centered**



### ***Preventing loss of control during landing***

#### ***The problem***

- Loss of control during landing is one of the leading causes of general aviation accidents and is often attributed to operational issues.
- Although most loss of control during landing accidents do not result in serious injuries, they typically require extensive airplane repairs and may involve potential damage to nearby objects such as fences, signs, and lighting.
- Often, wind plays a role in these accidents. Landing in a crosswind presents challenges for pilots of all experience levels. Other wind conditions, such as gusting wind, tailwind, variable wind, or wind shifts, can also interfere with pilots' abilities to land the airplane and maintain directional control.

#### ***Related accidents***

Between 2008 and 2015, there were, on average, 161 general aviation loss of control during landing accidents each year in the United States. The following accidents illustrate some common and preventable loss of control during landing scenarios:

- The private pilot lost directional control of the tailwheel-equipped airplane during landing with a crosswind, resulting in substantial damage to the fuselage, both wings and ailerons, and both elevators. He reported that, immediately after touchdown, he felt a strong left crosswind kick the tail to the right. He attempted to go around; however, a wind gust pulled the right wing to the ground. The pilot aborted the go-around attempt, and the airplane rolled off the runway with the right wing still in contact with the ground. The airplane then spun around onto its nose, with the left wing contacting the ground, and came to rest on its nose and left wing (see figure 1). ([WPR15CA102](#))



**Figure 1.** Airplane nosed over off of runway.

- The airline transport pilot failed to maintain directional control of the airplane while landing with a crosswind, resulting in substantial damage to the airframe. The pilot of the scheduled commuter flight (with six passengers) reported that, shortly after touchdown, the airplane encountered a wind gust and subsequently veered right off of the runway. He attempted to regain directional control of the airplane, but it skidded off the left side of the runway into grass, and the landing gear collapsed. The nearest weather reporting station recorded wind at the time of the accident that would have resulted in a direct 20-knot right crosswind. The Pilot's Operating Handbook indicated that the airplane had a maximum-demonstrated crosswind component of 15 knots (see figure 2). ([ERA15LA125](#))



Figure 2. Airplane off of runway in grass.

- The private pilot conducted an unstabilized approach, landed with excessive speed, and lost directional control of the airplane, resulting in minor pilot and passenger injuries and substantial airplane damage. The pilot reported that, as he neared the destination airport, he maneuvered the airplane on a steeper-than-normal glidepath to avoid tall trees located on the runway's approach path. The airplane touched down at an excessive ground speed and began to veer left. The pilot attempted to regain directional control with rudder control and brakes, but the airplane continued off the left edge of the runway, impacted a culvert, nosed over, and came to rest inverted. ([WPR13LA267](#))
- The airline transport pilot failed to maintain directional control of the tailwheel-equipped airplane during landing, resulting in substantial damage when the airplane collided with trees. He reported that as the airplane crossed the airport's intersecting runway, it bounced into the air near midfield. He then increased engine power and made a full-stall landing on the remaining runway. The airplane immediately veered left and departed the left side of the runway into a grass field. The pilot regained directional control and reestablished a ground track parallel to the runway before he attempted to abort the landing and execute a go-around from the grass field. Although the pilot was able to get the airplane airborne, he was unable to clear the trees along an airport perimeter road. ([CEN16LA029](#))

### **What can pilots do?**

- Evaluate your mental and physical fitness before each flight using the Federal Aviation Administration's (FAA) [I'M SAFE Checklist](#). Being emotionally and physically ready will help you stay alert and potentially avoid common and preventable loss of control during landing accidents.
- Check wind conditions and forecasts often. Take time during every approach briefing to fully understand the wind conditions. Use simple rules of thumb to help (for example, if the wind direction is 30 degrees off the runway heading, the crosswind component will be half of the total wind velocity).

- Know your limitations and those of the airplane you are flying. Stay current and practice landings on different runways and during various wind conditions. If possible, practice with a flight instructor on board who can provide useful feedback and techniques for maintaining and improving your landing procedures.
- Prepare early to perform a go-around if the approach is not stabilized and does not go as planned or if you do not feel comfortable with the landing. Once you are airborne and stable again, you can decide to attempt to land again, reassess your landing runway, or land at an alternate airport. Incorporate go-around procedures into your recurrent training.
- During landing, stay aligned with the centerline. Any misalignment reduces the time available to react if an unexpected event such as a wind gust or a tire blowout occurs.
- Do not allow the airplane to touch down in a drift or in a crab. For airplanes with tricycle landing gear, do not allow the nosewheel to touch down first.
- Maintain positive control of the airplane throughout the landing and be alert for directional control difficulties immediately upon and after touchdown. A loss of directional control can lead to a nose-over or ground loop, which can cause the airplane to tip or lean enough for the wing tip to contact the ground.
- Stay mentally focused throughout the landing roll and taxi. During landing, avoid distractions, such as conversations with passengers or setting radio frequencies.

### ***Interested in more information?***

The FAA's "[Airplane Flying Handbook](#)" (FAA-H-8083-3B), [chapter 8](#), "Approaches and Landings," provides guidance about how to conduct crosswind approaches and landings and discusses maximum safe crosswind velocities. The handbook can be accessed from the [FAA's website](#) ([www.faa.gov](http://www.faa.gov)).

The FAA Safety Team (FAASafetyTeam) provides access to online training courses, seminars, and webinars as part of the FAA's "WINGS—Pilot Proficiency Program." This program includes targeted flight training designed to help pilots develop the knowledge and skills needed to achieve flight proficiency and to assess and mitigate the risks associated with the most common causes of accidents, including loss of directional control. The courses listed below can be accessed from the [FAASafetyTeam website](#) ([www.faasafety.gov](http://www.faasafety.gov)).

- [Avoiding Loss of Control](#)
- [Maneuvering: Approach and Landing](#)
- [Normal Approach and Landing](#)
- [Takeoffs, Landings, and Aircraft Control](#)

The Aircraft Owners and Pilots Association Air Safety Institute offers several interactive courses, presentations, publications, and other safety resources that can be accessed from its [website](#) ([www.aopa.org/asf/](http://www.aopa.org/asf/)).

The National Transportation Safety Board's (NTSB) [Aviation Information Resources web page](#) ([www.nts.gov/air](http://www.nts.gov/air)) provides convenient access to NTSB aviation safety products. 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. This safety alert and others can be accessed from the [Aviation Safety Alerts](#) link.