



Disaster Prep

Tornado preparedness and safety

In this installment of **Disaster Prep**, we focus on how to minimize damage to commercial and residential structures in the event of a tornado, including actions to take to stay safe during a tornado.

With wind speeds that can exceed 300 mph, tornadoes can cause massive devastation and loss of life. The most violent tornadoes can level and blow away almost any structure. Although there are more tornadoes in the Midwest, Southeast and South areas of the U.S., they can occur anywhere. There is no such thing as guaranteed safety in the event of a tornado, but there are some practical measures you can take to prepare for and remain safe during and after a tornado.

Being aware of these tornado danger signs can help:

- Strong, persistent rotation in the cloud base
- Whirling dust or debris on the ground under a cloud base (not all tornadoes have a funnel)
- Hail or heavy rain followed by either dead calm or a fast, intense wind shift. Many tornadoes are obscured by heavy precipitation and can't be seen.
- Loud, continuous roar or rumble that doesn't fade in a few seconds
- Bright blue-green to white flashes at ground level near a thunderstorm (as opposed to silvery lightning up in the clouds). This means power lines are being snapped by very strong winds or a tornado.
- Persistent lowering from the cloud base, illuminated or silhouetted by lightning, especially if it is on the ground or there is a blue-green-white power flash underneath

We've created this Disaster Prep series to help you prepare for, protect against and respond to the effects of a natural disaster, such as a hurricane, flood or tornado.



For more information, please review the resources in our [Disaster Response Center](#) or contact your local Willis Towers Watson client relationship director or risk control consultant.

See our other reports in this series:

- **Disaster Prep: Hurricane preparedness and action plan (for your business)**
- **Disaster Prep: Hurricane preparedness and action plan (for you and your family)**
- **Disaster Prep: Flood evaluation and recovery plan**
- **Disaster Prep: Post-flood safety and security**
- **Disaster Prep: Business continuity management**

Take these precautions prior to a tornado to minimize damage:

- For businesses, identify the safest areas in a building, so employees know where to go. Consider constructing a tornado-hardened safe room. (For residences, the safest shelter areas typically include basements, hallways, interior stairwells and small internal first-floor rooms.)
- Post signs to direct employees and visitors to safe areas.
- Designate the roles and responsibilities of supervisors and employees.
- Practice tornado drills.
- Most damage and resulting injuries are caused by debris hurled by the storm rather than direct damage from high winds. To mitigate these effects:
 - Secure outdoor equipment and outbuildings to prevent them from becoming airborne missiles.
 - Reinforce vulnerable areas of a building, such as adding supports to garage doors, attaching walls securely to the foundation, and bracing and strapping the roof.
 - Locate servers and other vital equipment in protected areas of a building, preferably in tornado-resistant server rooms.
 - For new construction, work with an architect or contractor to incorporate wind mitigation techniques and high wind-rated products.

Monitor threatening weather

If severe weather is threatening, monitor weather forecasts to stay abreast of changing conditions via the National Oceanic and Atmospheric Administration (NOAA), weather radios, smartphones, TV or radio. Complete optional errands prior to severe weather arriving or defer them until after the severe weather passes.

Know the difference between weather warnings and watches:

- A **tornado watch** is issued when tornadoes and other kinds of severe weather are *possible in the next several hours*. It does not mean tornadoes are imminent, just that you need to be alert and ready to go to safe shelter if tornadoes do happen or a warning is issued.
- A **particularly dangerous situation (PDS) tornado watch** is issued when it is likely that multiple strong or violent tornadoes will occur in the watch area.
- A **tornado warning** means that a tornado has been spotted or that Doppler radar indicates a thunderstorm circulation, which can spawn a tornado. When a tornado warning is issued for your town or county, take *immediate safety precautions*.



What to do during a tornado

If in a commercial or industrial building:

Go directly to an enclosed, windowless area in the center of the building, away from glass and on the lowest floor possible. Then crouch down and cover your head. Interior stairwells are usually good places to take shelter and, if not crowded, allow you to get to a lower level quickly. Stay off the elevators; you could be trapped in them if the power is lost.

If in a house with a basement:

Avoid windows. Close and lock exterior doors and windows if there is enough time to do this safely. Go to the basement and get under some type of sturdy protection (heavy table or work bench), or cover yourself with a mattress or sleeping bag. Know where very heavy objects rest on the floor above (pianos, refrigerators, waterbeds, etc.) and avoid these areas as they may fall down through a weakened floor. A helmet can offer some protection against head injury.

If in a house with no basement, a dorm or an apartment:

Avoid windows. Close and lock exterior doors and windows if there is enough time to do this safely. Go to the lowest floor, small center room (like a bathroom or closet), under a stairwell or in an interior hallway with no windows. Crouch as low as possible to the floor, facing down and cover your head with your hands. A bathtub may offer partial protection. Even in an interior room, you should cover yourself with some sort of thick padding (mattress, blankets, etc.) to protect against falling debris in case the roof and ceiling fail. A helmet can offer some protection against head injury.

If in a mobile home:

Get out! Even if your home is tied down, it is not as safe as an underground shelter or permanent, sturdy building. Go to one of those shelters or to a nearby permanent structure. Most tornadoes can destroy even tied-down mobile homes, and it is best not to take chances.

If outdoors:

If possible, seek shelter in a sturdy building or in a culvert. If not, lie flat and face down on low ground, protecting the back of your head with your arms. Get as far away from trees and vehicles as you can; they may be blown around during a tornado. Be aware of the potential for flooding, especially if you take shelter in a culvert.

If in a vehicle:

Vehicles are extremely risky in a tornado. There is no fail-proof option when in a vehicle during a tornado. Tornadoes may move at speeds of up to 70 mph (112 kph). If the tornado is visible far away and traffic is light, you may be able to drive out of its path by moving at right angles to the tornado. Get out of your car and seek shelter in a sturdy building or underground, if possible.

If extreme winds or flying debris are present, park the vehicle as quickly and safely as possible out of the traffic lanes. Stay in the vehicle with the seat belt on. Put your head down below the windows; cover your head with your hands and a blanket, coat or other cushion. If it appears safe to leave your car, get noticeably lower than the level of the roadway and lie in that area as far from the road as possible (to avoid flying vehicles) and cover your head with your hands. Avoid seeking shelter under bridges, which offers little protection against flying debris and can create deadly traffic hazards.

Tornado safety do's and don'ts

Do's

- If you have time to lock doors, be sure to lock garage doors in their tracks.
- Seek shelter in the area beneath a staircase; in some instances, this may be the best shelter location.
- Make trees more wind resistant by removing diseased or damaged limbs, then strategically removing branches so that wind can blow through.
- Consider installing wind-resistant shutters that can be closed quickly to provide protection for windows.
- Avoid seeking shelter under bridges.

Don'ts

- Opening windows to equalize pressure is not advised; the winds and wind-borne debris could blast the windows out completely.
- Seeking shelter in a "safe southwest corner" is an old myth based on the belief that, since tornadoes usually come from the southwest, debris will preferentially fall to the northeast side of the basement. However, since tornadoes are mostly circular, the damaging wind may blow from any direction. Additionally, tornadoes may arrive from any direction.

Tips for avoiding injury after a tornado:

- Be careful when entering any structure that has been damaged.
- Wear sturdy shoes or boots, long sleeves and gloves when handling or walking on or near debris.
- Do not use matches, candles or lighters in case of leaking gas pipes or fuel tanks.
- Be aware of hazards from exposed nails and broken glass.
- Do not drive over or touch downed power lines or objects in contact with downed lines; there is a good chance they are live. (Most power lines carry 7,200 volts or more, and many are not insulated.)
- Do not move power lines with a branch or other object, since they may conduct electricity. Report electrical hazards to the police and the utility company.
- Use battery-powered lanterns, if possible, rather than candles to light homes without electrical power. If you use candles, make sure there are no gas leaks and they are in safe holders away from curtains, paper, wood or other flammable items.
- Hang up telephone receivers that may have been knocked off during the tornado, but stay off the telephone, except to report an emergency.
- Cooperate with public safety officials. Consider responding to requests for volunteer assistance by police, firefighters, emergency management and relief organizations.

Resources:

- [NOAA Storm Prediction Center, "Tornado Safety"](#)
- Minnesota Department of Public Safety, Metropolitan Emergency Managers' Association, "[Determining Severe Weather Shelter Areas in Buildings](#)"
- [FEMA: Tornado Protection: Selecting Refuge Areas in Buildings](#)