
Van Safety Guide For Drivers



Risk Control



Van Safety Guide for Drivers

This handbook is designed to alert drivers to the unique handling characteristics of full-sized passenger vans (10 to 15 occupants) and how those characteristics can impact safety.

Because of their design and use, full-sized vans pose several potential safety hazards, including:

- Handling characteristics that differ significantly from those of private passenger vehicles (e.g. greater stopping distance, extensive blind spots, a higher center of gravity, wider turning radius, slower acceleration, etc.).
- Limited side-impact protection for passengers.
- A greater risk of passenger injury when vans are used to transport numerous passengers.
- Increased risk of rollover accidents under certain conditions.

The National Highway Traffic Safety Administration's (NHTSA) 2001 van safety study highlights one of the most pressing concern involving full-sized vans—their propensity to overturn. The study was initiated following several well-publicized single-vehicle rollover crashes. NHTSA found that 15-passenger vans loaded to full capacity with passengers and baggage are three times more likely to roll over than similar vehicles that were not loaded to full capacity. This is because the vehicle's center of gravity shifts upward and rearward as it is loaded. Both factors adversely affect vehicle stability, making them susceptible to overturn accidents, especially during emergency maneuvers and run-off-road incidents. In numerous tests, vehicles loaded to capacity became unstable during sharp turns and sudden steering maneuvers. These results were produced at speeds as slow as 30 miles per hour. While the emphasis in this study was on 15-passenger vans, there are similar implications for all full-sized vans.¹

It is important for drivers to understand the potential hazards associated with operating full-sized vans. This guide contains precautions recommended by the National Highway Traffic Safety Administration (NHTSA) and other safety groups to help improve the level of safety for full-sized van drivers and their passengers.

Instructions: Read each session and answer the corresponding review questions. After completing the review sessions, please answer the questions in the final test. When completed, forward the final test to your training coordinator.

¹ The Rollover Propensity of Fifteen-Passenger Vans, National Highway Traffic Safety Administration Research Note, April 2001.

SESSION I VEHICLE HANDLING CHARACTERISTICS

Full-sized vans have unique handling characteristics because they are longer, wider, higher, and heavier than many personal automobiles. Vehicle performance and maneuverability are also affected by how passengers and baggage are loaded into the vehicle. Full-sized vans have a higher center of gravity compared to most other vehicles, which make them more susceptible to roll-over accidents under certain conditions. These limitations can increase the accident risk of full-sized vans. Drivers should understand these limitations and what precautions should be taken to help protect against accidents.

Here are a few of the important safety precautions full-sized van drivers need to know.

Stopping Distance

Full-sized vans are heavier than most private passenger automobiles, especially when fully loaded with passengers and baggage. This increases their stopping distance. In order to compensate for a greater stopping distance, van drivers should increase their following distance.

Transportation safety professionals recommend that full-sized van drivers maintain at least a four-second following distance in traffic under ideal road and weather conditions. When road or weather conditions are poor, following distance should be increased further to compensate for increased stopping distance, reduced visibility, and other hazards.

Stopping involves more than just putting your foot on the brake pedal. The following formula illustrates how a vehicle's stopping distance is calculated.

Perception Time ($\frac{3}{4}$ second)	+	Reaction Time ($\frac{3}{4}$ second)	+	Braking Distance	=	Total Stopping Distance
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Example:

How far will it take to stop a van traveling 60 mph (88 feet/second) under ideal road and weather conditions?

Perception time ($\frac{3}{4}$ second)	=	$\frac{3}{4}$ second x 88 ft/sec = 66 feet
Reaction time ($\frac{3}{4}$ second)	=	$\frac{3}{4}$ second x 88 ft/sec = 66 feet
Approximate braking distance @ 60 mph	=	<u>200 feet</u>

Estimated total stopping distance = 332 feet

Stopping distance is affected by many variables. These include speed, road and weather conditions, visibility, vehicle weight, condition of the vehicle's brakes and tires, driver alertness, and other factors. Actual braking distance can vary considerably from vehicle to vehicle. Drivers of full-sized vans should take these variables into consideration when determining whether following distance should be increased beyond the recommended 4-second minimum following distance.

Acceleration

Full-sized vans accelerate more slowly than many other smaller vehicles, especially when heavily loaded. This increases the amount of time required to cross an intersection and the amount of time needed to reach the appropriate speed to safely merge with traffic. Van drivers should consider these limitations when deciding whether it is safe to turn in front of oncoming traffic or merge with the flow of traffic. Care should be taken not to turn in front of oncoming traffic unless there is adequate time to safely clear the intersection or reach the appropriate speed to merge with traffic without causing other motorists to slow down, stop, or swerve to avoid a collision.



Stability

Full-sized vans have a high center of gravity, which make them less stable than many personal passenger vehicles. As a result, full-sized vans are more likely to roll over under certain conditions. Problems with vehicle stability and precautions drivers should take to reduce the potential for rollover accidents are discussed in Session II of this handbook.

Blind Spots

The van driver's view around the vehicle is limited by blind spots on both sides of the vehicle. These blind spots can increase the potential for accidents while backing up, passing, merging with traffic, and turning. Van drivers should not rely solely on their vehicle's mirrors. Before turning or passing, it is a good practice to look over your shoulder to make sure your blind spots are clear.

Vans also have a large blind spot directly behind the vehicle. Checking this blind spot before backing up is essential. If in doubt, getting out and looking behind the vehicle before backing up is a good habit.



Loading baggage above seat height is not recommended since this can further block your view and adversely affect the vehicle's center of gravity. In the event of a sudden stop, flying baggage can also injure passengers.

Turning Radius

Vans are longer and have a wider turning radius than most personal passenger automobiles. Van drivers must compensate for this by making sure they have adequate space to turn. This is especially important when turning in traffic. Drivers should anticipate sharp turns where skillful maneuvering is required to avoid backing up in traffic or in areas where there are pedestrians.

Session I
SESSION REVIEW QUESTIONS

1. A vehicle's total stopping distance depends on which variables?
 - a. Reaction time and braking distance.
 - b. Braking distance, reaction time, and time of day.
 - c. Perception time, reaction time, and braking distance.
 - d. Tire size, reaction time, and perception time.

2. Safety Professionals recommend that full-sized van drivers maintain a _____ second following distance in traffic when weather and road conditions are ideal.
 - a. 4
 - b. 2
 - c. 1
 - d. 3

3. Which concerns can arise as a result of a vehicle's slow acceleration?
 - a. More time is needed to safely cross intersections.
 - b. More time is needed to reach the appropriate speed to safely merge with traffic.
 - c. More time is needed to safely turn in front of oncoming traffic.
 - d. All of the above.

SESSION II VEHICLE STABILITY

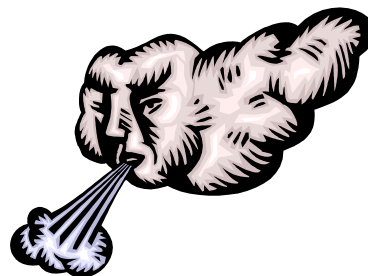
Full-sized vans have a higher center of gravity than most personal passenger vehicles. As passengers and baggage are added, the problem becomes worse, and in some situations, the vehicle can be at a high risk of rolling over, especially during emergency maneuvers and run-off-road incidents.

Drivers of full-sized vans should take precautions to help protect against roll-over crashes. Several important areas where precautions are warranted include:

- Driving practices
- Vehicle loading
- Emergency maneuvers

Driving Practices

Driving at a conservative speed is a good practice regardless of the type of vehicle you are operating. When the vehicle you are driving has a high-center of gravity, however, good speed management is critical. Extra precautions are warranted when road and weather conditions are less than ideal. Rain, snow, and ice increase your stopping distance, and they can affect your ability to control your vehicle. Since vans have a high profile, they are also more susceptible to the affects of strong crosswinds.



Full-sized van drivers should drive at a responsible speed, especially in corners, curves, and highway entrance and exit ramps. The posted advisory speed in these areas is intended for private passenger vehicles traveling under ideal conditions and may be unsafe for large vans.



Safety studies have demonstrated that full-sized vans can become unstable during abrupt steering maneuvers, causing the driver to lose control of the vehicle. Vehicle instability under these conditions has been demonstrated at speeds as low as 30 miles per hour. For this reason, drivers should avoid sudden steering maneuvers, especially at high speeds.

Vehicle Loading

Vehicles with a high center of gravity have an increased risk of rolling over. How these vehicles are loaded can further influence their center of gravity and their risk of overturning. There are several precautions drivers should take to help limit this risk. These include:

- Not exceeding the vehicle's seating capacity or gross vehicle weight rating. Ideally, staying well under these thresholds is recommended.
- Asking passengers to fill the front rows of the vehicle first and avoid sitting in the rearmost seats. This can help keep the vehicle's center of gravity from shifting too far rearward.
- Loading baggage below seat level and keeping heavy items close to the floor. Baggage should never be loaded on the roof of the vehicle or in rear-mounted luggage racks.
- Observing warning labels provided by the manufacturer detailing safe loading procedures.
- Not using passenger vans to tow trailers or other vehicles.

Emergency Maneuvers

A high center of gravity and other characteristics place full-sized vans at a high risk of rolling over during some emergency maneuvers. In many serious van crashes, the driver's sudden reaction to a hazard contributes to the accident. Drivers swerving to avoid roadway hazards, overcorrecting after a sudden steering maneuver, or swerving to get back on the roadway after driving off the road are common overturn accident scenarios.

The key to avoiding these accidents is to drive in a manner where emergency maneuvers are not necessary. Maintaining a safe following distance and scanning the roadway ahead for hazards are two important techniques to help avoid emergency situations that may require sudden evasive action. Avoiding distractions while driving, remaining alert, and getting adequate rest before you drive are also important. If an emergency maneuver does become necessary, drivers should avoid sudden, hard steering maneuvers, if possible.

Session II
SESSION REVIEW QUESTIONS

1. What vehicle characteristic can make full-sized vans susceptible to overturn accidents?
 - a. Bench-style seating.
 - b. A high center of gravity.
 - c. Rear-wheel drive.
 - d. None of the above.

2. What precautions can drivers take to help limit the risk of having a vehicle rollover accident?
 - a. Drive at a conservative speed, especially in curves and during adverse road and weather conditions.
 - b. Do not overload the vehicle and keep baggage below seat level.
 - c. Avoid sudden, hard steering maneuvers.
 - d. All of the above.

3. What driving techniques can help limit the need for emergency maneuvers?
 - a. Maintain a safe following distance and scan the roadway ahead for hazards.
 - b. Keep your emergency kit within reach.
 - c. Keep one foot on the brake at all times.
 - d. Have your cell phone ready to call 911.

SESSION III

ADDITIONAL PRECAUTIONS

In addition to the safety precautions discussed in the first two sessions, there are several other safeguards van drivers should consider.

Driver and Passenger Safety

Safety studies suggest that seat belts, if used properly, can reduce the risk of serious injury or death. Providing seatbelts for passengers and encouraging passengers to use them is important. If company policy requires passengers to use seat belts, drivers should enforce such policies. When seatbelt usage is at the passenger's discretion, the driver should strongly encourage their use.

Drivers should always wear their seatbelts. In many states this is the law.

Vehicle Inspection and Maintenance

A thorough vehicle inspection is an important responsibility. It can help determine if there are mechanical deficiencies that could result in breakdowns, delays, or contribute to an accident. Drivers should report all mechanical deficiencies to maintenance personnel promptly. Vehicles with serious mechanical deficiencies should be placed out of service until repaired. Drivers should also ensure that the vehicle has been serviced and inspected by a qualified mechanic on a regular basis.



Tire condition is especially important. In numerous cases involving van roll-overs, tire failure was a contributing factor. Tires should be examined frequently for excessive wear, damage, and proper inflation.

Routes

Where feasible, drivers should consider road quality when selecting which route to use, especially for long trips. For example, narrow, winding roads with blind intersections and without paved shoulders present numerous hazards. Divided highways with controlled intersections can often offer greater safety and a less stressful trip.

Driver's Assistant

For some types of operations appointing an assistant makes good sense. The driver's assistant can relieve the driver from several potentially distracting responsibilities such as map reading, navigation, making phone calls, or attending to passengers. If qualified to do so, an assistant can also act as a relief driver during long trips.

Session III
SESSION REVIEW QUESTIONS

1. Drivers should:
 - a. Wear their seat belt at all times while the vehicle is in motion.
 - b. Enforce company seat belt policies.
 - c. Encourage occupants to wear their seat belts when a company seat belt policy does not require passengers to do so.
 - d. All of the above.

2. A driver's assistant can help the driver focus on driving by:
 - a. Running errands.
 - b. Navigating and tending to the needs of passengers.
 - c. Washing the vehicle.
 - d. Loading and unloading baggage.

3. Drivers can help ensure that vehicles are in safe operating condition by:
 - a. Conducting thorough vehicle inspections.
 - b. Making sure vehicles are inspected regularly by a qualified mechanic.
 - c. Reporting any mechanical deficiencies to maintenance personnel promptly.
 - d. All of the above.

VAN SAFETY GUIDE FOR DRIVERS

SESSION REVIEW ANSWER KEY

SESSION I

1. A vehicle's total stopping distance depends on which variables?
c. Perception time, reaction time, and braking distance.
2. Safety professionals recommend that full-sized van drivers maintain a _____ second following distance in traffic when weather and road conditions are ideal.
a. 4
3. Which concerns can arise as a result of a vehicle's slow acceleration?
d. All of the above.

SESSION II

1. What vehicle characteristic can make full-sized vans susceptible to overturn accidents?
b. A high center of gravity.
2. What precautions can drivers take to help limit the risk of having a vehicle rollover accident?
d. All of the above.
3. What driving techniques can help limit the need for emergency maneuvers?
a. Maintain a safe following distance and scan the roadway ahead for hazards.

SESSION III

1. Driver should:
d. All of the above.
2. A driver's assistant can help the driver focus on driving by:
b. Navigating and tending to the needs of passengers.
3. Drivers can help ensure that vehicles are in safe operating condition by:
d. All of the above.

VAN SAFETY GUIDE FOR DRIVERS FINAL TEST

1. Full-sized vans pose several potential safety hazards, including:
 - a. Handling characteristics that differ from those of private passenger vehicles.
 - b. Limited side-impact protection for passengers.
 - c. A greater risk of passenger injury when vans are used to transport numerous passengers.
 - d. Increased risk of rollovers under certain conditions.
 - e. All of the above.

2. A full-sized van traveling 60 mph can take 330 or more feet to stop. This calculation includes:
 - a. Braking distance, wind resistance, and speed.
 - b. Reaction time, braking distance, and wind speed.
 - c. Perception time, reaction time, and braking distance.
 - d. Speed, weather conditions, and tire pressure.

3. When a van's passenger and cargo load increases, its:
 - a. Stopping distance and center of gravity increase.
 - b. Center of gravity decreases and stopping distance increases.
 - c. Weight increases and stopping distance decreases.
 - d. Stopping distance decreases and center of gravity increases.

4. What are some of the precautions a driver should take when driving a van fully loaded with passengers and baggage?
 - a. Adjust driving to account for slow acceleration.
 - b. Reduce speed when traveling around corners, curves, and highway entrance and exit ramps.
 - c. Avoid sudden, hard steering maneuvers.
 - d. All of the above.

5. Which of the following can help you avoid breakdowns, delays, and accidents?
 - a. A cell phone.
 - b. Thorough vehicle inspections.
 - c. Roadside emergency kit.
 - d. All of the above.

6. Which of the following does not help reduce the risk of roll-over accidents?
 - a. Exceeding the passenger or gross vehicle weight rating of the vehicle.
 - b. Scanning the roadway ahead for hazards.
 - c. Avoiding distractions.
 - d. Driving at a conservative speed, especially in curves and around corners.

7. Vehicle stopping distance is **not** affected by:
 - a. Speed and vehicle weight.
 - b. Road and weather conditions
 - c. Condition of the vehicle's tires and brakes.
 - d. Driver alertness.
 - e. None of the above.

8. Full-sized vans have unique handling characteristics compared to many personal passenger vehicles because they:
 - a. Have diesel engines.
 - b. Are longer, heavier, wider, and higher.
 - c. Drive faster.
 - d. Have a tighter turning radius.

9. Stacking baggage above seat level is not recommended because it:
 - a. Restricts the driver's view through the rear window.
 - b. Adversely affects the vehicle's center of gravity.
 - c. Could injure passengers in the vehicle if the vehicle comes to a sudden stop.
 - d. All of the above.

10. The advisory speed limit posted at curves and entrance and exit ramps is designed for _____ during ideal road and weather conditions.
 - a. Heavy trucks and buses.
 - b. Motorcycles.
 - c. Personal passenger vehicles.
 - d. All of the above.

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