

Employee Handout - Speed and space management

1. Discuss the factors involved in stopping.

Content: There are four factors involved in stopping a vehicle:

- * perception distance;
- * reaction distance;
- * brake lag distance; and
- * braking distance.

Perception distance. Perception distance is the distance a vehicle travels from the time the driver's eyes see a hazard until his/her brain recognizes it. The perception time for an alert driver is $\frac{3}{4}$ of a second. At 55 mph this accounts for 60 feet traveled.

Reaction distance. Reaction distance is the distance traveled from the time the driver's brain tells his/her foot to move from the accelerator until his/her foot hits the brake pedal. The average driver has a reaction time of $\frac{3}{4}$ of a second. That accounts for 60 feet traveled if the vehicle is going 55 mph.

Brake lag distance. When operating a vehicle with air brakes, it takes about $\frac{1}{2}$ second for the mechanical operation to take place.

Braking distance. Braking distance is the distance it takes to stop once the brakes are applied. Braking distance is affected by weight, length, and speed of the vehicle as well as road condition. Remember, a heavy vehicle's components (brakes, tires, springs, etc.) are designed to work best when a vehicle is fully loaded. At 55 mph a heavy vehicle can stop in about 250 to 300 feet. An empty vehicle traveling at the same speed can stop in between 300 and 400 feet.

High speeds increase stopping distances. By slowing down, braking and stopping distances are reduced. Also, the heavier the vehicle, the more work brakes must do to stop.

Notes: It is important that your drivers understand the concepts discussed before proceeding.

If time and facilities allow, a visual demonstration may help illustrate the increase in stopping distance as speed increases. Have one of your drivers perform four runs (one each at 10, 15, 20, and 25 mph) on the range. On each of the runs have him/her reach the assigned speed then safely stop the vehicle. Once the vehicle is stopped have two of your students measure the distance from the initial braking to the actual point where the vehicle stopped.

Exercises: None

2. Discuss speed and road conditions.

Content: Traction is necessary for vehicle control. Certain road conditions reduce traction and lower speeds are necessary.

Ice, snow, rain: A slippery road can increase a vehicle's stopping distance and make turning difficult. In order to stop safely, reduce speed by $\frac{1}{3}$ on wet roads and $\frac{1}{2}$ on snow covered roads. If the surface is ice, get off the road as soon and as safely possible.

Shady roads: Shady portions of the road can remain slippery for a long time after ice on sunny areas of the road has melted and the pavement is dry.

Bridges: When the temperature drops, bridges can freeze before the road does. If slippery conditions are likely, avoid any change (acceleration or braking) in driving habits while crossing the bridge.

Traffic flow: When in heavy, constantly moving traffic, the safest speed is usually the speed other vehicles are traveling. Vehicles going in the same direction at the same speed are less likely to run into one another.

Curves: Remember that posted speed limits on curves are designed with cars in mind. Hitting a curve with a commercial motor vehicle at the posted speed limit can cause several problems including skidding off the road or vehicle roll over.

Notes: Open your session to discussion. Ask your veteran drivers to share their experiences.

Exercises: None

3. Discuss space management.

Content: Safe driving includes managing all space surrounding the vehicle. This includes the space ahead, behind, above, below, and around the vehicle.

Space ahead: The amount of space needed depends on the speed of the vehicle and road conditions. One rule of thumb to follow (in good driving conditions) is to allow one second for each 10 feet of vehicle length at speeds below 40 mph. At greater speeds add an additional second. In poor driving conditions (rain, ice, snow) allow for a greater stopping distance.

Space behind: It is impossible to keep other drivers from following too closely, but there are some things that can be done to make it safer. Stay to the right, slow down, and give the tailgater plenty of chances to

pass.

Space to the sides: Commercial motor vehicles often take up most of a lane. There are several things a driver should try to avoid:

- * don't hug the center line (it becomes very easy to drift across the line into another lane of oncoming traffic);
- * don't hug the right side of the road (a soft shoulder can cause control problems); and
- * don't travel alongside other vehicles.

There are two dangers in traveling alongside other vehicles:

- * another driver may change lanes suddenly turning into the commercial motor vehicle; or
- * the commercial motor vehicle may be trapped, unable to change lanes.

Drivers also need to keep an eye out for strong winds, especially cross winds. The problem is most prevalent for empty or light trucks. Drivers should try to avoid driving alongside others in this situation.

Space above: Hitting overhead objects is also a danger. Never assume the heights posted on bridges and overpasses are correct. Repaving or packed snow may reduce the clearances since the heights were posted.

The weight of a vehicle's cargo can also change its height. An empty vehicle is higher than a loaded one.

Be aware of how a road is graded. Road grade can cause a high vehicle to tilt, which can be a clearance problem.

If a driver has doubts about whether there is enough overhead space to proceed he/she should take another route.

Space below: It's very easy for a driver to forget the space under his/her vehicle. That space can be very small when the vehicle is heavily loaded. Railroad tracks, dirt roads, and unpaved lots can be a challenge. Slow and steady is the rule in these cases.

Notes: Slides of space basics, simple overhead illustrations, or a video can help get the point across.

Exercises: None

4. Discuss turning space.

Content: Correct procedures are important when making turns. Because of wide turning and offtracking, commercial motor vehicles run the risk of hitting other vehicles or objects during turns.

Right turns: When making a right turn, the driver must proceed slowly, giving himself/herself and others time to avoid trouble. The driver needs to keep an eye on the right side of the vehicle assuming that smaller vehicles may try to pass on the right.

Left turns: When executing a left turn the driver needs to make sure the vehicle has reached the center of the intersection before starting the turn. Starting it too soon can lead to offtracking, causing the left side of the rig to hit another vehicle.

Notes: Turning is covered in depth in the Cornering Techniques portion of the Training Customizer.

Exercises: None