

Module 7 – Safe Driving Practices

The laws of nature are physical forces that are with you whenever you drive. These forces include gravity, friction, inertia, kinetic energy, and the force of impact.

The influences of these forces will vary depending on a vehicle's weight, speed and direction. You should operate your vehicle to compensate for these powerful natural forces.

At the conclusion of this module you will be able to recognize safe driving practices that will assist you in being a more defensive driver. Topics covered in this module include: Natural forces, Maintaining the proper speed, Changing lanes, Right of way, and Adverse driving conditions

The force of impact is the force of an object colliding with another object. Factors that affect the force of impact include the object's weight, speed, and distance traveled after initial contact. Why is this important? If you hit something with your vehicle, the force of impact is a huge factor relative to the amount of damage incurred by the vehicle and its occupants.

Here is an example of how disastrous the force of impact can be: If you weigh 100 pounds, traveling at 30 M.P.H. and hit a stationary object, the force of impact is 3,000 pounds (weight times the speed you're traveling). That's like a ton and a half hitting you on impact.

The force of impact increases if the object you hit is moving toward your vehicle. This is the reason you need to avoid head-on collisions at all costs. Later in the course we will review methods of steering and braking to avoid head-on collisions and reduce the force of impact in emergency situations.

Speed influences crashes in four basic ways:

1. It increases the distance a vehicle travels from when a driver detects an emergency until the driver reacts.
2. It increases the distance needed to stop a vehicle once an emergency is perceived.
3. Crash severity increases by the square of the speed. For example, when speed increases from 40 to 60 mph, speed goes up 50 percent while the energy released in a crash more than doubles.
4. Higher crash speeds reduce the ability of vehicles, restraint systems, and roadway hardware such as guardrails, barriers, and impact attenuators to protect occupants.

Driving at high speeds is dangerous, even when you are traveling the speed limit. High speed increases the risk of collision because:

- Vision is reduced;
- Traction and maneuverability are reduced;
- Inertia is increased and it takes the brakes longer to stop the vehicle;
- Force of impact is greater; and
- May cause other road users to misjudge the time they may have to react.

As a driver, it's important to understand that increased speed increases your stopping distance. Stopping distances involve three factors: Perception distance, Reaction distance, and Braking distance.

Perception distance - This is the distance your vehicle travels from the time you see a hazard with your eyes to the time your brain registers it and triggers a response. The faster you travel, the less information you are able to see and process. Highway hypnosis or daydreaming, can dramatically increase perception distance. You can't perceive a hazard if you are not fully alert so when you snap out of the day dream or drowsiness there is less time and space to perceive, react and brake.

Reaction distance - This is the distance traveled from the time your brain issues an instruction, to the time your body carries out the instruction. An example of this would be the amount of time it takes to lift your foot and press the brake pedal.

Braking distance - This will vary depending on the speed at which you are traveling and the conditions of the roadway and the vehicle. The faster you are traveling, the longer it will take for your vehicle to stop.

As speed increases, each of the stopping distance factors increases. The faster you go, the longer it takes to perceive, react, and brake. Traction also impacts your stopping distance. Adverse conditions such as rain, snow, fog, wind, water, and slick roads can increase the distance required to stop. Always abide by the posted speed limit and reduce speed when driving in adverse weather.

If you drive a late model vehicle, it features vehicle impact and restraint systems designed to absorb energy and help protect you in a crash. The vehicle impact and restraint systems all work together. Your vehicle has shock absorbent bumpers, a passenger cage designed not to "give", airbags, and restraint systems. These systems help reduce injury and provide occupant impact protection.

Maintain your speed to blend with the flow of traffic without going over the posted speed limit. Maintaining a safe gap between vehicles reduces front and rear-end collision potential.

Determine a safe speed to travel based on:

Traffic density and the rate of flow. When you enter a congested traffic area, the space between vehicles is limited. Adjust your speed to open up space to maneuver.

The design and condition of the roadway. If road traction and surface conditions are less than ideal, reduce your speed to maintain traction.

How far ahead you can see. If you cannot see clearly or around obstacles, reduce your speed in the event you need to make an unexpected evasive maneuver.

Adjust your speed when you encounter slow-moving vehicles. If a vehicle turns right from a stop into your lane, it will take time for that vehicle to accelerate to the speed of traffic. Slow

down or move into the passing lane if available early to avoid closing in too close behind the slower vehicle.

Select the proper lane for the speed you travel. When traveling on roads with two or more lanes in each direction, the right lane is for slower vehicles and the left lane is for faster traffic. This is true on a rural highway or a limited access facility but less so on urban collectors and arterials.

As you approach a curve, keep in mind that you cannot change the weight of your vehicle or lower its center of gravity. You cannot alter the sharpness of the curve in the road. But you do have control over one critical factor as you go through a curve, and that is your speed. Managing speed is critical to maneuvering safely through a curve. Follow these guidelines for managing speed through curves...

- Watch for clues about how slow you need to go before entering a curve. Look for advance warning signs and begin to reduce your speed as soon as you see the sign.
- Do not drive into the curve faster than the speed posted on the warning sign.
- Try not to brake in the curve. Braking moves the weight of your vehicle sideways putting a strain on your tires, which could cause a blowout or rollover.
- Do not increase your speed until you are through the curve and see a straight path ahead of your vehicle.
- Obey the double solid yellow line and do not pass another vehicle, no matter how slow they may be going.

Enter the curve SLOWER than the posted speed if:

- Road conditions are slippery or if surface traction is less than ideal.
- You are entering a blind curve that you cannot see around. OR
- Your vehicle is tall and has substantial weight loaded high.

Taller vehicles, trucks, and SUVs have a higher center of gravity than most cars, and in turn, a higher risk of rollover. You move the center of gravity up if you pack cargo above the baseboard or on the roof. If your vehicle has a high center of gravity, you may need to drive at reduced speeds, especially when entering and maneuvering through curves.

Drive slowly as you approach the top of a steep hill. Be prepared to drive slowly downhill. Never drive fast downhill because when speed is combined with the increase in the pull of gravity, you can easily lose control.

Do not weave in and out of traffic lanes. There are, of course, times when you must change lanes such as:

- The lane you are traveling in is ending;
- You have to move into a designated turn lane;
- You are in an area such as a construction zone that mandates lane change; and when
- You need to pass another vehicle.

What do you do when changing lanes?

Ensure the road is clear enough to perform the maneuver using your vehicle's mirrors and turn your head to check blind spots. Using your turn signal, indicate your intentions; leave your turn signal on until you have completed the maneuver. Ensure the area in the adjacent lane is clear. Execute the maneuver smoothly, maintaining your speed if possible. When you are established in the new lane, cancel your turn signal. Adjust your speed to match traffic flow and adjust your vehicle's position if necessary. If you move back into your original lane of travel, use your turn signal and repeat the process.

If there is a nearby vehicle in the lane you want to move into that is approaching at a faster speed at which you are traveling, simply wait for the vehicle to pass you and then make the lane change. Do not get in front of that car. Not only could it make the driver angry, but more severely, the driver might not have enough time to slow down behind you. Do not change lanes while you are driving through an intersection or approaching an intersection. Wait until you pass through the intersection to change lanes.

Never assume you have the right of way; another road user must give it to you. Drivers and other road users make mistakes and demonstrate a lack of courtesy even when they know the rules. Do your best to communicate your intentions when there is confusion about right of way.

Follow the rules of the following scenarios:

Emergency vehicle is approaching. You must yield to any emergency vehicle that is using its siren and flashing lights. Move to the far right of the roadway and stop your vehicle. When the emergency vehicle has passed, check all mirrors to be sure no additional emergency vehicles are coming. Safely re-enter traffic when the roadway is clear.

Turning left and U-turns. Signal your intention when turning left at an intersection or when making a U-turn. Yield to all oncoming traffic until there is a gap providing you with sufficient time and space to safely turn.

Exiting a driveway or parking space. Yield to all vehicles already traveling in the roadway. Remember to stop and look in both directions before you cross the sidewalk if there is one; yield to pedestrians, bicyclists, and others. Repeat the process upon reaching the edge of the travel lane.

Pedestrians present. Drivers must yield to pedestrians in marked or unmarked crossings. Drivers must also exercise "due-care" to avoid hitting a pedestrian even if they are not in a pedestrian crossing.

Blind persons present. Always yield to persons who carry a white cane or have a guide dog, *wherever* they are in the roadway.

Blocked lane. If your lane is blocked, you must yield the right of way to other vehicles around you before you can change lanes to go around the vehicle blocking your lane. Your lane is

ending. If your lane is ending, you must yield the right-of-way to vehicles already traveling in adjacent lanes.

Always keep your vehicle properly maintained. Especially before the rainy season begins, prepare your vehicle for wet weather driving. Keep your windshield, windows, and headlights clean.

Service your vehicle. Ensure the following systems are in good operating condition: Tire inflation, tread depth; Windshield wipers, fluid, and blades; Battery; Lights; Brakes; Ignition; and the Defroster (windows can quickly steam up during rain events)

Prepare yourself for driving in wet weather by allowing ample travel time, and be mentally alert for common mishaps caused by weather. Eliminate as many distractions as you can inside the vehicle - what is happening outside the vehicle will be more challenging and require your undivided attention.

Driving on slippery surfaces requires increased visual range. Focus your attention far ahead on the roadway to ensure you can gauge the distance between you and the obstacles ahead; ensure that you have ample time to start, turn, slow and stop.

Before driving, make sure your vehicle is properly maintained, especially your tire pressure. Properly inflated tires are less likely to lose contact with the roadway surface. Under-inflated tires can lead to skids and a loss of vehicle control. Wet roads result in poor traction.

When rain first starts falling, the water mixes with dust, dirt, sand, and oil on the road surface, creating a slippery substance. The first 20 minutes of a rain shower is the most dangerous time to be driving. As the rain continues to fall, this slippery mixture is often washed away; however, the road is still wet and it continues to present a low traction driving environment.

When starting from a stopped or standing position and traction is poor, accelerate gradually. Steer with smooth, precise movements. Try to do one thing at a time - increase your following distance and avoid puddles and flooded areas of the road. Position your tires to follow dry tracks created by other vehicles in your path ahead.

Be conscious of spray from your vehicle and other vehicles. Be considerate and if possible, slow down if you encounter pedestrians or bicyclists.

Avoid driving through deep water or any water that is flowing across the roadway. If the water depth is as high as the bottom of your vehicle, DO NOT DRIVE into the water. If the water is below the bottom of your car and as high as the rims of your vehicle, drive very slowly and position your vehicle in the center of the road; avoid driving on or near the shoulder.

Hydroplaning is caused by a combination of speed, standing water, and inadequate tire tread depth. When a tire is hydroplaning, it is riding on the surface of the water instead of making contact with the road surface. If tires are new and have a deep tread, water will be channeled through the treads and will help your tires keep in contact with the road. Worn tires that have little to no tread can begin to lose their grip at less than 30 mph in a wet roadway situation.

If your vehicle begins to hydroplane:

- Reduce speed; take your foot off the accelerator.
- Grip the steering wheel firmly.
- Avoid braking or accelerating.
- Look and steer in the direction you want the vehicle to go. You must be prepared to turn the steering wheel again and again until the front of the vehicle is traveling in a straight line.
- Wait for the tires to grip the road. Continue to steer in the direction you want the vehicle to go.
- Check your mirrors for potential hazards to the sides and behind your vehicle.

Do not use your cruise control during rain events or on slippery or wet roads. Wet roads can cause wheel spin and loss of control especially when you have to react quickly. The amount of time it takes you to disengage the cruise control could be sufficient enough to involve you in a collision.

Fog is formed when the temperature and dew point are the same. Fog can reduce visibility to 1/4 mile or even less. Statistically, heavy fog is one of the most dangerous environments you can drive in. The best course of action for heavy fog is to get off the road and wait for the fog to dissipate. If you are forced to drive in fog apply the following:

- Use your head lights on low beam; high beams are reflected off the fog and will impair visibility.
- Fog can make roads slick, so when driving in fog, adjust your speed, avoid over steering and brake smoothly.
- Slow down. Fog can present a visual illusion making it very difficult to gauge your speed.
- Open your window a little, so that you can hear traffic noise you cannot see.
- Make maximum use of wipers and defrosters.
- Monitor road markings for guidance.
- Be cautious and patient with other traffic.
- When driving in fog other drivers will follow tail lights. If your vehicle becomes disabled try not to stop on the roadway, pull off the road and turn off your lights.
- Never use your flashing lights unless you are parked on the shoulder. Not only is it unsafe, but it is against the law to driver with our flashing lights on.

Driving in high winds can present some serious safety issues. The following techniques will help you to cope with high winds:

- Your best course of action is to slow down and be very aware of how you are steering, especially when moving from an underpass to an open area or when you encounter buses, trucks, or trailers.
- Monitor the type of vehicles that are surrounding you on the road, some are far more susceptible to wind than your vehicle. High winds dramatically affect buses, trucks, SUV's, recreational vehicles, campers, and trailers in an adverse manner.

- You may encounter slippery roads because wind is often accompanied by heavy rain, ice, or snow; be prepared.

The Center for Disease Control and Prevention (CDC) has addressed carbon monoxide and its implications with vehicles. CDC defines Carbon Monoxide (CO) as an odorless and colorless gas. It can cause sudden illness and death. CO can be found in combustion fumes, such as those produced by all types of vehicles (cars and trucks) using combustible materials. CO from these sources can build up in enclosed or semi-enclosed spaces. People and animals in these spaces can be poisoned by breathing it.

The most common symptoms of CO poisoning are a headache, dizziness, weakness, nausea, vomiting, chest pain, and confusion. High levels of CO inhalation can cause loss of consciousness and subsequent death. Unless suspected, CO poisoning can be difficult to diagnose because the symptoms mimic other illnesses. People who are impaired from alcohol or other materials can die from CO poisoning before ever experiencing any symptoms.

To preclude Carbon Monoxide poisoning from your vehicle follow these guidelines:

- Have a mechanic check the exhaust system of your vehicle at least once a year. A small leak in your vehicle's exhaust system can lead to a buildup of CO inside the car.
- Do not run a car or truck in the garage with the garage door shut. CO can build up quickly while your car or truck is running in a closed garage. Never run your car or truck inside a garage that is attached to a house and always open the door to any garage to let in fresh air when running a car or truck inside the garage.
- If you drive a vehicle with a tailgate, when you open the tailgate, you also need to open vents or windows to make sure air is moving through your car. If only the tailgate is open CO from the exhaust will be pulled into the vehicle.

Let's see if we can remember some important points. You will now be asked some review questions based on this CBT. You may select your answer by choosing the corresponding button or by pressing the corresponding letter on your keyboard.

1. Factors that affect the force of impact include the object's:
 - a. weight
 - b. speed
 - c. distance traveled after initial impact
 - d. All of the answers are correct

The answer is d. All of the answers are correct.

2. If you are driving you must yield to:
 - a. pedestrians
 - b. buses
 - c. trucks bigger than you
 - d. delivery trucks

The answer is a. pedestrians.

3. If your vehicle begins to hydroplane:
 - a. accelerate
 - b. relax your grip on the steering wheel
 - c. brake heavily
 - d. try to reduce speed using the accelerator

The answer is d. try to reduce speed using the accelerator.

And now let's review the lesson.

Speed has a dramatic impact on the severity of crashes.

Recognize how weight affects your vehicle when you judge your stopping distance. If your vehicle is loaded with cargo and passengers and is heavier than usual, it will take longer to stop depending on amount of extra weight.

Vehicle impact and restraint systems all work together. These systems help reduce injury and provide occupant impact protection. Buckle up!

Manage speed when maneuvering through a curve.

Never assume others will give you the right of way.

Communicate your intentions when there is confusion about the right of way.

The next module presents information on how to defensively manage space around your vehicle. This concludes the module on safe driving practices.