UNIT SIX – DEFENSIVE DRIVING

INTRODUCTION

It only takes a split second of carelessness or one distracted moment, and a child can be killed or injured for life. Accidents can be prevented by driving defensively.

There are six major causes of car collisions and accidents:

- **Driver Incompetence** – A great number of drivers lack the proper training on road safety. Many of them even defy the traffic regulations such as tailgating, speeding, and many more road rules that tend to protect the motorist, including them, from harm.
- **DUI Driver or Intoxication** – Driving a car after drinking liquor excessively is very dangerous, for it impairs driving capabilities. It is illegal to operate a Commercial Motor Vehicle (CMV) if your blood alcohol concentration (BAC) is .04% or more.
- **Distractions** – Motorists are expected to exercise extreme concentration in driving. However, so many distractions tend to divert their attentions and make their driving too risky. Examples are active discussions with the passengers, improper use of cell phones, texting, loud car stereos, etc.
- **Adverse Weather** – Weather is a large factor in safe road travel. Studies show that many car accidents occur during bad weather conditions, making the road surfaces slippery and affecting clear visibility.
- **Poor Road Design** – The state has the obligation to make sure that our roadways are properly designed and safe for public use. The government sets up road safety signs and equipment. The temporary road safety signs take priority over the permanent signage. Failure to obey these may cause an incident or accident that risks the lives of workers, passengers, and drivers.
- **Vehicle Defects –** Motorists and car owners should inspect and service the vehicle prior to a trip. Taking these precautions lessens the chances of road catastrophes.

THE THREE A's OF DEFENSIVE DRIVING

- Attitude
- Awareness
- Actions

DEFENSIVE DRIVERS

- Stay positive
- Stay aware
- Expect the unexpected
- Stay in control
- Act, don't react

ATTITUDE - YOUR FIRST DEFENSE

Most traffic accidents are caused when a driver performs poorly. In most cases poor driving performance is caused by a poor attitude. Keep a positive attitude.

Your attitude affects

- How an individual drives
- Reaction time
- How passengers behave
- Level of alertness
- In short, how a driver performs behind the wheel

Make your first defense a positive attitude

- Before you start your day, adjust your attitude
- Leave your personal baggage at home
- If you're running late, relax and get positive
- Know you're a good driver

Steer clear of road rage

What happens when driving down the road and some careless driver cuts you off, or tailgates, or drives erratically in your direction – even waves a fist or a gun? Road rage! What do you do?

- Steer clear of it
- You can't control another person's attitude, only your own
- Never take a driver's behavior personally
- Avoid eye contact
- Stay within the posted speed limit
- Keep at a safe distance from other vehicles
- Use your horn sparingly
- If you have to, count to ten
- Get your students to school or home safely
- If necessary, and safe, pull off (if the aggressive driver follows, do not stop)

AWARENESS - EXPECT THE UNEXPECTED

Stay alert; be aware and prepared for anything. After you have been driving a route for a while, you get used to the road conditions and traffic flow. Never get too comfortable. Stay alert; expect the unexpected. Be ready for situations that may change without notice; there usually is not much time to think it out.

- Driving conditions can change
- Traffic patterns can change
- The route can change
- Student's behavior can be unpredictable
- The vehicle can have an unexpected problem
- The time it takes to get from Point A to point B can vary

Stay alert, be aware, and prepared for anything – even before pulling out of the lot.

- Find out about road conditions before departure
- Listen to morning and afternoon weather and traffic reports
- Talk to the supervisor and other drivers about road hazards
- If a substitute or new driver, ask about safety hazards before the first run
- If new to the area, study local maps
- Before the start of a route, do a proper pre-trip inspection of the vehicle.

Awareness reminds you that children are apt to do the craziest things at the worst possible times.

ACTION - TAKE CONTROL OF SAFETY

Defensive drivers act; they don't react. Take actions to make sure you and your passengers stay safe. Keep in mind you are responsible for the most precious cargo there is.

- When you act, you are in control of what you do
- When you react, you respond impulsively to others' behavior
- When you think of action, think control
- That is the goal

BASIC RULES OF DEFENSIVE DRIVING

- Always wear your seatbelt
- See it, predict it, act upon it
- Evaluate the "big picture" 15 seconds ahead

- Scan mirrors every 5-8 seconds
- Use the “4 second rule” when following other vehicles
- Know your peripheral vision = 180 degrees of visibility
- Goal is to see 360º - use mirrors to see what cannot be seen when turning your head
- Keep your eyes moving
- Always allow yourself an out
- Stay within the posted speed limits
- Signal all turns and lane changes
- Never tailgate
- Keep a safe distance between your vehicle and the vehicle in front of you
- Avoid other drivers’ blind spots – the rear and sides of a car and directly behind a truck
- Make sure other drivers see you
- Turn your head when making lanes changes to check blind spots
- When passing, signal lane changes
- Check both rear and oncoming traffic
- If you can see an oncoming vehicle, don not risk passing
- Be especially cautious when visibility is reduced
- On hills, dips, and curves, decrease your speed
- Stay to the right in case an approaching driver is in the center of the road
- Be aware of stale green lights

ON THE ROAD

Lane Lines - Yellow and white broken and solid lines are to aid you in lane driving and passing. Following is a description of the differences in lines and their purposes.

- A broken yellow line marks the center of a two-way, two-lane road. Drive on your half of the road and pass with care.
- A broken white line separates traffic lanes on a one-way street or roadway of a divided highway. Observe lane-use rules and change lanes only when it is safe to do so.
- A solid yellow line on your side of the road or a double solid yellow line in the center of the road marks a no-passing zone. Do not pass when the solid yellow line is on your side.

- A double-solid yellow line may also mark the center of a two-way, two-lane or four-lane street. Do not drive to the left of this center line.
- Two separate sets of double-solid yellow lines represent a dividing strip on a very wide street or highway where there is not a physical separation of two-way traffic. Do not drive to the left of the solid yellow lines.
- A solid white line (fog line) marks the outside edges of far left and right traffic lanes.
- Crossing a painted center line or painted center island is allowed for a left turn into an alley, private road, or driveway when such movement can be made safely.

Refer to the current revision of the Colorado Drivers' Manual.

Highway Signs - There are three sign classifications

- Warning - Diamond shape is used to warn of existing or possible hazards on roadway or adjacent areas.

- Regulatory - Vertical rectangles are generally used for regulatory signs, which tell you what you must do.

- Guide - Horizontal rectangles are generally used for guide signs, which show location, direction or other special information.

Right-of-Way - At an uncontrolled intersection, the vehicle on the right has the right-of-way. Left-turn traffic must yield to all other traffic except when a left turn arrow is present.

According to 42-4-108, C.R.S., emergency vehicles may take the right-of-way.

42-4-108, C.R.S. Public officers to obey provisions

(2) The driver of an authorized emergency vehicle, when responding to an emergency call, or when in pursuit of an actual or suspected violator of the law, or when responding to but not upon returning from a fire alarm, may exercise the privileges set forth in this section, but subject to the conditions stated in this article. The driver of an authorized emergency vehicle may proceed past a red or stop signal or stop sign, but only after slowing down as may be necessary for safe operation.

(4) The provisions of this section shall not relieve the driver of an authorized emergency vehicle from the duty to drive with due regard for the safety of all persons, nor shall such provisions protect the driver from the consequences of such driver's reckless disregard for the safety of others.

If you are stopped at a student stop to unload, and an emergency vehicle is approaching:

- Keep the students on the bus if possible.
- If the students are still on the bus, cancel your 8-ways and activate your hazards.
- Leave the 8-ways on if the students have exited the bus.
- If students are already off the bus, signal them about the emergency vehicle and try to keep them clear.
- Let the operator of the emergency vehicle make the decision when it is safe for him to proceed.

Remember, keeping the students safe is your number one priority.

Pedestrians must obey the same traffic controls as vehicles, e.g. signal lights and stop signs. At uncontrolled pedestrian crossings, the pedestrian has the right-of-way.

Headlights - A vehicle must have headlights with high and low beams. State statute requires that headlights must be on between the hours of sunset and sunrise. Also, CDE rules specify: 1 CCR 301-26, 4204-R-234.01. Headlight Operation

The school transportation vehicle's headlights or daytime running headlights shall be activated while the vehicle is in motion.

SEEING

To be a safe driver, the driver must know what is taking place around the vehicle. In a large vehicle like a school bus, this is accomplished by proper mirror use. You should check the side mirrors, both left and right, regularly and often, approximately every 5 to 8 seconds. Inadequate surveillance is a major cause of accidents.

Look Far Enough Ahead

- Scan far enough ahead to be able to react safely to situations
- Look ahead along your intended path of travel about 12 to 15 seconds
- At lower speeds, this is about one city block
- At highway speeds, this is about one quarter of a mile
- When following a large vehicle, allow additional space so you may have a greater range of sight

Get the Big Picture

- Eyes should be constantly on the move to obtain the “big picture” by using all mirrors
- Look ahead; use left side, right side, and student management mirrors every 5-8 seconds to check traffic
- Shift your attention back and forth, near and far

Traffic

- Look for vehicles coming onto the highway, into your lane, or turning
- Watch for brake lights from slowing vehicles
- See far enough ahead to enable you to adjust your speed or change lanes if necessary, to avoid a problem

It is important to know what is going on behind and to the sides of your vehicle. There are "blind spots" that your mirrors cannot show you. Doing mirror checks regularly and often, (approximately every 5 to 8 seconds) will let you know where other vehicles are around you, and when they move into your blind spots. Following these rules will eliminate surprises.

Hills and Curves

- Look for hills, curves, or anything that may make slowing or changing lanes necessary
- When driving uphill in a school bus, watch for traffic in all directions, paying particular attention to the sides and rear of the vehicle
- Do mirror checks often and use 4-way hazard lights if traveling under 25 mph
- Activate your hazard lights if the speed of your vehicle impedes the normal flow of traffic
- When going around a curve, check your mirrors to be sure the rear of the vehicle is tracking correctly in your lane and not encroaching into the other lane

Traffic Signals and Signs

- Pay attention to traffic signals and signs
- If a light has been green for a long time (stale green), it will probably change before you get there; start slowing down and be ready to stop
- Crosswalk signal with a flashing hand is an indication the light is about to change
- Traffic signs may alert you to road conditions indicating the need to change speed or lanes

Lane Changes, Turns, Merging, and Tight Maneuvers

- Scan mirrors thoroughly before changing speed or direction
- A minimum of 6 mirror checks should be performed during lane changes, turns, merges and tight maneuvers
- Check both left and right outside mirrors prior to, during, and at the completion of the maneuver

Types of Mirrors - Colorado Minimum Standards Governing School Transportation Vehicles - 1 CCR 301-25, 2251-R-68.02

Exterior mirrors: Each school bus shall be equipped with a system of exterior mirrors including cross over mirrors in compliance with FMVSS111. This system of mirrors shall be rigidly braced so as to reduce vibration.

School buses may be equipped with different types of cross over mirrors but both mirrors should be the same make and type. Everything appears smaller and farther away in convex type mirrors. It is important to make proper allowances when using this type of mirror. School bus mirrors must be adjusted properly to ensure the driver has visibility in the critical areas surrounding the bus. See Unit Three for mirror adjustment grid.

HAZARDS OF THE ROAD

A hazard is any road condition or road user (driver, bicyclist, pedestrian, animal) that may create a danger. Recognizing a hazard allows you time to be prepared and ready to react if an emergency develops.

Always Have a Plan - A professional driver is constantly looking for hazards. Many hazards turn into emergencies. Being watchful and prepared to act will give you time to plan a way out of an emergency. Always have and escape route.

Following are examples of hazards to be aware of

- **Animals** - Wild animals or domestic livestock may be on or next to the roadway and are very unpredictable. Swerving to avoid them can cause loss of control of your vehicle. Ninety percent of deer/vehicle collisions occur between dusk and dawn.
- **Bicycles** – Bicycles, especially when ridden by children can be unpredictable. Give them plenty of room when passing.
    - 42-4-1008.5, C.R.S. – Crowding or threatening bicyclist. The driver of a motor vehicle shall not, in a careless and imprudent manner, drive the vehicle unnecessarily close to, toward, or near a bicyclist.
    - Any person who violates subsection (1) of this section commits careless driving as described in 42-4-1402.
- **Children** - Children may not be looking for traffic and may create a hazard. They see traffic from a very different perspective. Always expect the unexpected.

- **Conflicts** - Conflicts are a hazardous condition. When a change in speed and/or direction to avoid hitting other vehicles occurs, a conflict with other vehicles may be created. Conflicts occur at intersections where vehicles meet, at merge areas (such as on and off ramps), and where there are forced lane changes (such as the end of a lane, forcing a move to another lane of traffic). Other situations include slow moving or stalled traffic in the roadway and crash scenes. Watch for drivers who are in conflict with others. Depending on the way they react to the situation, it may put them in conflict with you.
- **Confused drivers** - A slow, confused driver often changes direction suddenly or may stop without warning. Tourists may be unfamiliar with the area near freeways or major intersections. Hesitation, driving very slowly, frequent use of brakes, or stopping quickly may indicate the driver is looking for a street or house number.
- **Crash scenes** - People involved in a crash are distracted and may not be observant of oncoming traffic. Often at the scene of a crash, people run across the roadway without looking, while passing motorists tend to slow down or stop suddenly. You must also be alert for emergency vehicles and equipment arriving at the scene.
- **Disabled vehicle** - Be especially alert when approaching a disabled vehicle stopped along the roadway. Drivers changing a tire or checking the engine may not pay attention to roadway traffic.
- **Distracted people** - People who are distracted in some way present a hazard for drivers. Pedestrians and bicyclists may be distracted by wearing portable stereos with head sets, having their back to the traffic, looking elsewhere, or hurrying to get out of the inclement weather. Drivers or pedestrians talking on cell phones or texting may not be paying attention.
- **Drivers in a hurry** - Drivers in a hurry may feel your school bus is preventing them from getting to their destination on time. They may pass you without leaving a safe gap in the oncoming traffic, or they may cut too close in front of you, causing you to brake suddenly. Drivers of postal vehicles and local delivery vehicles are often in a hurry stepping out of their vehicle or re-entering the flow of traffic.
- **Drivers Under the Influence** - Motorists under the influence of drugs or alcohol are a hazard to themselves and to motorists. Be especially alert around closing times for sporting events or nightclubs. Watch for drivers who have trouble staying in their lane, do no maintain a constant speed, stop without reason, or show other signs of being under the influence of alcohol or drugs.
- **Drop -offs** - Uneven pavement and the shoulder of the road present a road hazard. If the tires of the vehicle drop off the edge of the pavement, it could cause the vehicle to tilt, hitting roadside objects. It may also be difficult to steer the vehicle back on to the roadway.
- **Fallen objects** - Avoid objects that have fallen onto the roadway. Hitting an object may cause damage to, or loss of control of, the vehicle.

- **Impaired drivers** - An impaired driver may be sleepy, ill, or under the influence of drugs, alcohol, or medications. Some of the signs to look for are weaving, erratic speed, and inappropriate stops.
- **Obstructed views** - Be alert for drivers of vehicles with the rear window blocked. Their view may be limited or obstructed.
- **On/off ramps** - Many freeway and turnpike on and off ramps have posted speed limit signs. These should be considered maximum speeds for large vehicles. Use special caution on downhill and curved parts of the ramp. Entrance and exit ramps may be very short and can exit to the left instead of to the right.
- **Parked vehicles** - Parked vehicles can be a hazard. Watch brake lights, backup lights, exhaust fumes, front wheels turned to the traffic side of the road, and other clues that might indicate the driver is about to move the vehicle.
- **Pot Holes** – These can develop quickly, especially in the spring. Hitting potholes may cause loss of steering control and damage to the bus.
- **Shopping areas** - People in and around shopping areas are often not watching closely because they are looking for a certain store or looking into store windows. They may be carrying packages, talking to a companion, or supervising one or more children.
- **Trucks** – Be cautious when driving around large trucks, especially in hazardous road and weather conditions.
    - Avoid tailgating a truck. Trucks need twice as much stopping distance.
    - Never pull out in front of a truck or cut a truck off.
    - Do not drive in a truck's blind spot. Drive where you can be seen. Trucks have a deep blind spot directly in front of the cab, off to the right and left sides, and to the immediate back. These blind spots make up what is called the NO-ZONE.
    - Never drive in a truck's NO-ZONE.
    - Remember: If you cannot see the driver's face in the truck side-view mirrors or cannot see the whole cab in your rear-view mirror when you are in front of the truck, then you are in a truck's NO-ZONE and must adjust the vehicle position as soon as possible.
- **Work zones** - Work zones with construction vehicles and workers require caution and courtesy on the driver's part. Lanes may be narrow and uneven. Keep your eyes focused ahead and use your 4-way hazard lamps to warn drivers behind you of the need for caution.

COMMUNICATING

Signaling - Other drivers do not know what you are going to do until you tell them. Therefore, signaling is important for safety. Situations that require signaling include turning, lane changing, slowing, stopping, passing, and parking.

Directional Signals - Directional signals are used to communicate with surrounding traffic when you are going to perform a maneuver that requires a change in your path of travel. Three good rules for using turn signals are:

- **Signal early** - Signal well before the maneuver you are about to execute. It is the best way to keep others from trying to pass you.

  The signal should be activated:

  - at least 100 feet before the maneuver when the speed limit is 40 mph or less
  - at least 200 feet when the speed limit is over 40 mph
- **Signal continuously** - You need both hands on the wheel to complete the maneuver safely.
- **Cancel signal** - When you have finished the maneuver and established your desired path of travel, cancel the signal.

Lane Changes - Activate the turn signal before changing lanes. Change lanes slowly and smoothly. Perform traffic checks prior to, during, and after executing lane changes. If changing several lanes, “take possession” of each lane prior to proceeding to the next lane.

Passing - Whenever you are about to pass a vehicle, pedestrian, or bicyclist, assume they do not see or hear you. They could suddenly move in front of you. At night, flash your headlights from low to high beam and back. Drive carefully to avoid a crash.

When It’s Hard to See - At dawn or dusk, or in rain or snow, you need to make your vehicle more visible. If you are having trouble seeing other vehicles, other drivers may have trouble seeing you. Leave the headlights on low beam; high beams can bother people in the daytime as well as at night.

Slowing Down - Warn drivers behind you when you need to slow down. A few light taps on the brake pedal to flash the brake lights will warn drivers behind you. Use the 4-way hazard lamps when you are driving less than 25 mph when in an area with a higher posted speed limit or are stopped. Warn other drivers in the following situations:

- **Trouble ahead** - The size of your vehicle may make it hard for drivers behind you to see hazards ahead. If you see a hazard that will require slowing down, warn the drivers behind by flashing your brake lights.
- **Tight turns** - Most car drivers do not know how slow you have to go to make a tight turn in a large vehicle. Give drivers behind you warning by braking early and slowing gradually.
- **Stopping on the road** - When stopping on the road for any reason other than student stops, warn drivers behind you by activating your brake lights, turn signals, or hazard lights. Do not stop suddenly.
- **When parked at the side of the road** - After pulling off the traveled portion of the road and stopping, activate the 4-way hazard lamps. This is very important at night. Do not trust the tail lights to give warning. Drivers have crashed into the rear of a parked vehicle because they thought it was moving normally. If you must stop on a road or the shoulder of a road, place the reflective triangles appropriately as soon as possible. See Unit Eleven, Emergencies.

Driving Slowly - Drivers often do not realize how fast they are catching up to a slow moving vehicle until they are very close. In Colorado, if you are a traffic hazard; such as stopping at a railroad crossing, traveling under 25 mph on a highway or interstate, or parked, you must use the 4-way hazard lamps to alert other drivers. Do not use the hazard lamps otherwise. (Laws regarding the use of hazard lamps differ from one state to another. Check the laws of other states where you might drive.)

Horn - Using the horn can let others know you're there and may help to avoid a crash. Use your horn when needed. However, it can startle others and could be dangerous when used unnecessarily.

Eye Contact - By establishing eye contact, you have a better indication that the other driver or pedestrian sees you. Do not rely on eye contact alone.

Do Not Direct Traffic - Some drivers try to help others by signaling when it is safe to pass or to pull out into the traffic lane. Do not do this. Directing traffic may cause an accident, and you could be held liable.

EMERGENCIES

Emergencies - Traffic emergencies occur when a collision is imminent. Vehicle emergencies may occur when tires, brakes, or other critical parts fail. Following the safety practices in this manual can help prevent emergencies. If an emergency develops, your chances of avoiding a crash depend upon taking appropriate action.

Steering to Avoid a Crash - Stopping is not always the safest action to take in an emergency. When you do not have enough room to stop, you may have to steer to avoid a crash. You can almost always steer to miss an obstacle more quickly than you can stop. An evasive maneuver may be needed to avoid

a collision. However, be aware of the consequences of swerving, one of which is rolling over. (See Unit Seven, Mountain Driving, for exceptions.) Doing frequent mirror checks will allow you to be aware of your options.

Grip the Wheel Firmly with Both Hands - Do not apply the brake while you are turning. Locking your wheels while turning may cause the vehicle to skid out of control. Turn just enough to clear what is in your way. The sharper you turn, the greater the chance of a skid or rollover. Be prepared to "counter-steer" (i.e., to turn the wheel back in the opposite direction once you have cleared whatever was in your path.) Think of emergency steering and counter steering as a two-part action.

Where to Steer - If an oncoming vehicle has drifted into your lane, it is safest to move to the right. The driver may realize what has happened and respond by returning to his/her own lane. Using mirrors allows you to know which lane is empty and can be safely used. Moving right onto the shoulder may be the only available escape route. Care should be taken to determine that the shoulder is strong enough to support the weight of a large vehicle. Try to avoid using the brakes until your speed has dropped to 20 mph; then brake gently. Always check traffic in the mirrors and signal what you intend to do. If possible, keep one set of wheels on the pavement, which helps maintain control.

Leaving the Road - In some emergencies, you may have to drive off the road. This option could be less risky than facing a collision with a larger vehicle. However, a head-on collision with a small vehicle may be preferable to facing a drop-off next to the road.

Returning to the Road - If you are forced to return to the road before you stop, use the following procedure. Hold the wheel firmly and turn sharply enough to get right back onto the road safely. Do not try to edge gradually back onto the road as the tires might grab unexpectedly, causing you to lose control. When both front tires are on the paved surface, counter-steer. The two turns should be made as a single "steer-counter-steer" movement.

Stopping Quickly and Safely - When someone suddenly pulls out in front of you, the natural response is to apply the brakes. This may work if there is enough distance to stop. The correct use of brakes is necessary. You should brake in such a way as to keep your vehicle in a straight line to allow you to turn if necessary. The best method for maximizing braking is "Threshold Braking" for stopping in the shortest distance. This is true whether the bus is equipped with anti-lock braking systems (ABS) or not.

When using the threshold braking method, apply the brakes up to the point of locking the wheels. Keep the steering wheel movements small. If you need additional steering, or if the wheels lock, back off the brakes lightly until the wheels begin rolling again. In vehicles with ABS, apply the brakes the same

way. If the wheels do lock, the ABS system will release and reapply the brakes very quickly. Do not release pressure on the service brake. Releasing and reapplying (pumping) the brakes will cause the ABS system to fail. Never pump or “stab” the brakes.

Hydraulic Pressure - When the system does not build up pressure, the brake pedal will feel spongy or go to the floor. If possible, downshift to the next lowest gear. Pumping the brakes may generate enough hydraulic pressure to stop the vehicle. If needed the park brake may be used.

Loss of Air Pressure - If the low air pressure warning comes on, stop and safely park the vehicle as soon as possible. Enough air may be in the system to make a smooth stop. Controlled braking is possible only while air remains in the system. The spring brakes will activate when air pressure drops into the range of 45 to 10 psi. Depending on the roadway surface, large vehicles may skid even at speeds under 20 mph if spring brakes activate. It is safer to stop normally while there is enough air in the system to operate the service brake.

Find an Escape Route - While slowing the bus, look for an escape route, such as an open field, side street, or escape ramp. Take care that the bus does not roll backward after stopping. Find an obstacle to stop the bus if possible.

Brake Failure - Brake failure occurs if there is loss of pressure or over-heating. Brakes kept in good condition rarely fail.

Brake Failure on a Downgrade - Escape ramps may be used, should it become necessary. Also, soft gravel resists the motion of the vehicle and turning uphill may stop the vehicle. See additional information in Unit Seven, Mountain Driving.

TIRE FAILURE

Prevent Tire Blowout

- Prevent with a proper pre-trip inspection.
- Proper inflation of the tires is important because:
    - Low inflation or lack of tread increases the effect of hydroplaning, reduces cornering ability, and increases the chance of a blowout.
    - Stopping distance is increased from poor contact with road surface.
    - Over-inflation increases the chance of tread separation and tire failure.
- Avoid curbs.
- Report defects or damage.

Recognize Tire Failure - Quickly knowing there is a tire failure allows more time to react. Having just a few seconds to remember what to do helps control the situation. Major signs of tire failure are:

- **Sound** - The loud “bang” of a blowout is easy to recognize. Because it can take a few seconds for your vehicle to react, you might think it was some other vehicle. Any time you hear a tire blow, assume it was yours.
- **Vibration** - If the vehicle thumps or vibrates heavily, it may be a sign that one of the tires has gone flat. With a rear tire, that may be the only sign you get.
- **Feel** - If the steering feels “heavy,” it is probably a sign that one of the front tires has failed. Sometimes failure of a rear tire will cause the vehicle to slide back and forth or “fishtail.” However, dual rear tires usually prevent this.

How to Handle a Tire Blowout

- Use proper hand placement.
- Hold the steering wheel firmly - If a front tire fails, it can twist the steering wheel out of your hand. The way to prevent this is to keep a firm grip on the steering wheel with both hands at all times. Weight of the bus will shift.
- Do not apply the service brake.
- Stay off of the brake - It’s natural to want to brake in an emergency. However, braking when a tire has failed could cause loss of control.
- Slowly accelerate the vehicle to even out.
- Accelerating slightly may help with control. Unless you’re about to run into something, stay off the brake until the vehicle has slowed down. Then brake very gently, pull off the road and stop.

- Move your vehicle to a safe location.
- Pull the park brake to stop the bus.
- After coming to a stop, get out and check all the tires, even if the vehicle seems to be handling properly. If one of the dual tires goes out, the only way to know it is to get out and thump it.
- Look for signs of fire.

MANAGING SPACE

To drive safely, you need space all around your vehicle. When things go wrong, space gives you time to think and to take action.

Having space available when something goes wrong, requires managing space. While this is true for all drivers, it is very important for drivers of large vehicles. Large vehicles take up more space and require more space for stopping and turning.

Space Ahead - Of all the space around your vehicle, it is the area ahead of the vehicle (the space you are driving into) that is most important. At least a 15-second lead time can help with planning for an upcoming problem. You need space ahead in case you must stop suddenly. According to accident reports, the vehicle that buses most often run into is the one in front of them. The most frequent cause for this type of crash is following too closely. Remember, if the vehicle ahead of you is smaller than yours, it can probably stop faster than you can.

When stopped at an intersection behind another vehicle, allow extra space between vehicles by waiting four seconds before you start out.

How much space should you keep in front? You need at least one second for each 10 feet of vehicle length at speeds below 40 mph. At greater speeds, you must add one second for safety. For example, if you are driving a 40-foot bus, you should leave four seconds between you and the vehicle ahead (five seconds if traveling over 40 mph).

To know how much space you have, wait until the vehicle ahead passes a shadow on the road, a pavement marking, or some other clear landmark. Count off the seconds like this, “one thousand-and-one, one thousand-and-two” and so on, until your front bumper reaches the same spot. Compare your count with the rule of one second for every 10 feet of length. If you are driving a 40-foot bus and counted up to two seconds, you are following too close. Drop back a little and count again until you have four seconds of following distance (five seconds, if you’re traveling over 40 mph). After practicing, you will know how far back you should be. Remember, adverse road conditions increase stopping distance.

When stopped behind another vehicle at a traffic light or stop sign, remain far enough behind that vehicle to see where its tires meet the pavement.

Space Behind - You can't stop others from following too closely. In school buses, it is often hard to see a vehicle that is close behind you. You may be tailgated when you are traveling slowly. Drivers trapped behind slow vehicles often follow too closely. Look for shadows on the road or reflections to determine if someone is following closely behind you.

Many drivers in cars follow too closely during adverse weather. If you are being tailgated, here is how to reduce the chances of a crash:

- Avoid quick changes. If you have to slow down or turn, signal early and reduce speed very gradually.
- Increase your following distance. Opening up room in front of you will help you avoid having to make sudden speed or direction changes. It also makes it easier for the tailgater to get around you.
- Do not speed up. It is safer to be tailgated at a low speed than at a high speed.
- Avoid tricks. Do not flash your brake lights.
- If a heavy load is slowing you down, stay in the right lane if possible. Activate hazard lights if under 25 mph or become a hazard.
- When traveling uphill, do not pass another vehicle unless you can get around quickly and safely.

Space to the Sides - School buses are wide and take up most of a lane. Safe drivers will manage what little space they have. You can do this by keeping the vehicle centered in the lane, and avoid driving alongside others.

Some dangers when traveling alongside other vehicles are drivers changing lanes suddenly and being trapped when you need to change lanes.

Find an open spot where you aren't near other traffic. When traffic is heavy, this may be difficult or even impossible. If you must travel near other vehicles, keep as much space as possible between you and them. Drop back or pull forward so you are sure the other driver can see you.

On multi-lane roadways, vehicles tend to travel in herds. Try to drop back or move ahead of the cluster so you do not become a part of someone else's mistake.

Strong winds make it difficult to stay in the lane. Lighter vehicles may have more difficulty than heavier ones. Strong winds can be especially bad coming out of tunnels or after crossing bridges. It is best to avoid driving alongside others whenever possible.

Space Overhead - Hitting overhead objects is a danger. Always make sure to have overhead clearance. Do not assume that the heights posted at bridges and overpasses are correct. Repaving, ice, or packed snow may have reduced the clearances since the heights were posted.

Know the height of your bus. **(This changes when vents and roof hatches are added and opened).**

- If you are uncertain whether there is adequate space to pass under an object, take another route.
- Warnings are often posted on low bridges or underpasses, but not always.
- Some roads can cause a vehicle to tilt. If there is a problem clearing objects such as signs or trees along the edge of the road, drive a little closer to the center of the road.
- Before backing into an area, get out of the vehicle and check for overhanging objects, such as trees, branches or electric wires. You may not see them while you are backing. (Also check for other hazards at the same time.)

Space Below - Many drivers forget about the clearance space under their vehicles. Under-storage compartments may lower the clearance of the vehicle. Drainage channels and other depressions across roads can cause the long rear overhang of school buses to drag. Cross such depressions carefully.

CONTROLLING SPEED

Driving too fast to control the vehicle is a major cause of fatal crashes. You must adjust your speed to driving conditions. These include traction, curves, visibility, traffic, and hills.

Stopping Distance - There are three things that add up to total stopping distance:

Perception Distance + Reaction Distance + Braking Distance =

Total Stopping Distance

Perception Distance - This is the distance your vehicle travels from the time your eyes see a hazard until your brain recognizes it. The perception time for an alert driver is about 3/4 second. At 55 mph, you travel 60 feet in 3/4 second.

Reaction Distance – This is the distance traveled from the time your brain tells your foot to move from the accelerator until your foot is actually pushing the brake pedal. The average driver has a reaction time of 3/4 second. This accounts for an additional 60 feet traveled at 55 mph.

Braking Distance - The distance it takes to stop once the brakes are applied. At 55 mph, on dry pavement with good brakes, it can take a heavy vehicle about 170 feet to stop, about 4 1/2 seconds. For vehicles equipped with air brakes, allow an additional half-second for the air to flow through the lines to the brakes**.** At 55 mph, this equals 32 feet. This is known as "**air brake lag distance."**

Total Stopping Distance - At 55 mph it will take about five seconds to stop and your vehicle will travel about the distance of a football field.

Hydraulic Brakes - (PD + RD + BD) 60 + 60 + 170 = 290 feet.

Air Brakes - (PD + RD + BD +LD) 60 + 60 + 170 + 32 = 322 feet.

Effect of Speed on Stopping Distance - Whenever you double speed, it takes about four times as much distance to stop, and the vehicle will have four times the destructive power if it crashes. High speeds increase stopping distances greatly.

By slowing down a little, it will greatly reduce your braking distance.

Speed and Curves - Drivers must adjust their speed for curves in the road. If you take a curve too fast, two things can happen. The wheels can lose traction and continue straight ahead, causing the vehicle to skid off the road, or the wheels may keep their traction causing the vehicle to roll over. Tests have shown that vehicles with a high center of gravity can roll over at the posted speed limit for a curve.

- Slow to a safe speed before you enter a curve. Braking in a curve is dangerous.
- Slow down as needed. Don't ever exceed the posted speed limit for the curve. To help maintain control, be in a gear that will allow a slight acceleration through the curve.

Reminder – The posted advisory speed is normally set for cars, not buses.

Speed and Distance Ahead - You should always be able to stop within the distance you can see ahead. Fog, rain, or other conditions may require a slower speed to enable you to stop within that distance. At night, you can't see as far ahead with low beams as you can with high beams. When using low beams; slow down.

Caution – Never outdrive the range of what your headlights illuminate.

Speed and Traffic Flow - Drive at the speed of the traffic if possible, without traveling at an illegal or unsafe speed. Maintain a safe following distance.

A common reason drivers exceed the speed limit is to save time. Anyone trying to drive faster than the speed of traffic will not be able to save much time. The risks involved are not worth it. Going faster than the speed of other traffic results in:

- Frequently passing other vehicles, thus increasing the chance of a crash.
- Fatigue, which also increases the chance of a crash.

Recommendation - When driving on a highway with a posted speed limit of 75 mph, the bus should be 5 – 10 mph below speed limit.

Speed on Downgrades - Traveling at an appropriate speed is the most important thing when descending long, steep hills safely. If you do not go slowly enough, overuse of the brakes can cause them to become so hot (brake fade) they will not slow the vehicle down. Shift the transmission to a lower gear and check the brakes before starting down the grade. Pay attention to warning signs for long downhill grades ahead. Descending steep hills safely is discussed more in Unit Seven, Mountain Driving.

PROPER BRAKING TECHNIQUES

Remember: The use of brakes/retarder on a long and/or steep downgrade is only a supplement to the braking effect of the engine. Once the vehicle is in the proper low gear, apply the retarder, if equipped. The following is the proper braking technique:

- Downshift the transmission prior to the crest of the hill.
- Be in the proper gear.
- Apply the brakes/retarder just hard enough to feel a definite slowdown.
- When speed has been reduced to approximately 5 mph below your “safe” speed, release the brakes. (This brake application should last for about 3-5 seconds).
- When your speed has increased to the “safe” speed, repeat steps 2 and 3. For example, if the “safe” speed is 40 mph, you would not apply the brakes until the speed reaches 40 mph. You now apply the brakes hard enough to gradually reduce the speed to 35 mph and then release the brakes. Repeat this as often as necessary until you have reached the end of the downgrade.
- If braking is occurring often, the bus is not in a low enough gear.

DRIVING AT NIGHT

Driving at night creates a greater risk for drivers. Hazards are not as visible as during daylight hours, so there is less time to respond. Drivers caught by surprise are less able to avoid a crash. Three factors that affect night driving are: the driver, the roadway, and the vehicle.

Driver Conditions - People cannot see as sharply at night or in dim light. Also, the eyes need time to adjust to seeing in dim light. Most people have noticed this when walking into a dark movie theater. Drivers can be blinded for a short time by bright light. Some drivers are especially bothered by glare. People have been temporarily blinded by the high beams of an oncoming

vehicle. It can take several seconds to recover from glare. Even two seconds of glare blindness can be dangerous. A vehicle going 55 mph will travel more than half the distance of a football field during that time. Avoid experiencing glare blindness by looking to the right side of the road when someone coming toward you has very bright lights.

Fatigue and lack of alertness may increase at night. The body's need for sleep is beyond a person's control. Most people are less alert at night, especially after midnight. This is particularly true if you have been driving for a long time. Drivers may not react as quickly to hazards, increasing the chance of a crash. When you are sleepy, the only safe cure is to get off the road and get some sleep. If you do not, you are risking your life and the lives of others.

Roadway Conditions - In the daytime there is usually enough light to see well. This is not true at night. Some areas may have bright streetlights; others will have poor lighting. On most roads, you will probably have to depend entirely on your headlights.

Less light means you will not be able to see hazards as well. Road users who do not have lights are hard to see. There are many crashes at night involving pedestrians, joggers, bicyclists, and animals.

Even when there are lights, the road scene can be confusing. Traffic signals and hazards can be hard to see against a background of signs, shop windows, and other lights. Use a slower speed when lighting is poor or confusing so you are able to stop within the distance you can see ahead.

Vehicle Conditions - At night, your headlights will usually be the main source of light enabling you to see and others to see you. Visibility is not nearly as good at night with your headlights as in the daylight. Low beams allow you visibility of about 250 feet while high beams allow about 350-500 feet. Adjust your speed to keep stopping distance within sight distance (The ability to stop within the range of your headlights.)

Night driving can be more dangerous if you have problems with your headlights. Dirty headlights may give only half the light they should. This cuts down your ability to see, and it makes it harder for others to see you. Make sure all lights are clean and working properly. Headlights can be out of adjustment. If they don't point in the right direction, they don't give you a good view and can blind other drivers. Have a qualified person make sure they are adjusted properly.

In order for you to be seen easily, the following must be clean and working properly:

- Reflectors
- Turn signals
- Clearance lights
- Reflective tape
- Taillights
- Headlights
- Brake lights

At night, your turn signals and brake lights are even more important for communicating to other drivers what you intend to do. Make sure they are clean and working properly.

It is essential at night to have a clean windshield and mirrors. Bright lights at night can cause dirt on the windshield or mirrors to create a glare of its own, blocking your view.

Most people have experienced driving toward the sun just as it has risen or is about to set and found that they can barely see through a windshield that appears alright in the middle of the day. Clean the windshield on the inside and outside for safe driving at night.

Deaths from vehicle collisions occur three times more often in the evening, so pay special attention while driving in the late afternoon, early evening, and early morning hours.

Dangers

- Visibility may be reduced.
- Peripheral vision is not as sharp.
- Darkness impairs your ability to judge distances, movements and colors.
- More likely to become sleepy.
- Night blindness makes objects appear further away.
- Depth perception in mirrors is distorted.
- Slow down and drive with greater caution.

Precautionary Measures

- Before starting to drive at night, give your eyes an extra five minutes to adjust to the dark.
- Properly pre-trip your vehicle and know the location of your switches.
- Never wear sunglasses when driving in low light conditions.
- Turn headlights on at twilight. CDE requires headlights to be on when the vehicle is in motion.
- Slow down and leave at least 300 feet between you and the vehicle ahead of you.
- Dim the lights before they cause glare for other drivers; within 500 feet of an oncoming vehicle and within 500 feet of a vehicle in front of you.
- Use high beams when you can. Some drivers make the mistake of always using low beams. This seriously cuts down on their ability to see ahead. Use high beams when it is safe and legal to do so.
- Do not look directly at the high beams of an approaching vehicle – look forward and slightly to the right.

- Flip your rearview mirror to the night position in order to reduce glare when driving a smaller vehicle.
- Light inside the vehicle makes it harder to see outside. Keep the interior light off and adjust the instrument lights as low as possible and still be able to read the gauges.
- Stop driving if you are sleepy. People often do not realize how close they are to falling asleep. You are in a very dangerous condition. The only safe cure is to sleep.

The defensive driving exercises can be found in the Unit Seventeen. The requirements to successfully complete the exercises are located in several units of this manual.