West Virginia Department of Education

Office of School Transportation

"We Drive For Excellence"

BEHIND THE WHEEL INSTRUCTION MANUAL

2008/2009 Edition

This manual is to be used as an instructor's guide for the (12) hours of actual behind the wheel training per individual applicant.

This training is to be completed with a certified instructor and the applicant on a one on one basis in order to meet specifications.

INTRODUCTION OF SCHOOL BUS OPERATION

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The following is a recommendation for the minimum amount of time that should be spent on each area.

Two hours (2) of the actual driving time will be night driving.

Basic controls one (1) hour

Basic skills one (1) hour

Basic maneuvering two (2) hours

On Road:

Rural one (1) hour

Urban one (1) hour

Expressway one (1) hour

Student Loading/Unloading two (2) hours

Railroad crossing (1) hour

OBJECTIVES

- By the end of this unit, the students should have:
- Knowledge of Driver Compartmental Controls
- Knowledge of Proper Seat Adjustment
- Knowledge of Starting the Engine
- Knowledge of proper use of the Park Brake
- Knowledge of the use of the Clutch and Transmission
- Knowledge of the use of the Brakes
- Knowledge of Basic Vehicle Skills
- Knowledge of Basic on Road Skills
- Knowledge of **Railroad-Highway Crossings**
- Knowledge of **Danger Zones and Use of Mirrors**
- Knowledge of **Loading and Unloading**

OVERVIEW:

This manual is to teach you the basic skills necessary to operate school buses safely and efficiently in transporting this most valuable cargo. To accomplish this, well-trained and safety oriented drivers are required.

An established comprehensive training program will teach you the procedures for basic driving skills and techniques, maneuvers, detecting hazards, potential hazards, appropriate driving techniques, positioning of the school bus and emergency conditions. School bus operators hold the greatest responsibility of any other driver today. In past years, accidents involving school buses were caused by the school bus operators in approximately half of all accident cases. Those school bus operators did not follow procedures of driving fundamentals. Through practice, correct basic procedures will become a habit and will improve your performance as a school bus operator.

To be a good bus operator, you must position yourself in control; you must be able to reach and operate the controls in comfort and be able to see the areas all around the bus.

Driver Controls:

1. **Driver should be instructed on all controls, such as ABS, ATC, Retarders, Automatic chains, Door locks, Vandal Locks, & Ignition interlocks when equipped. How they work and where they are located.**

Automatic Traction Control:

Normal Vehicle Operation (ATC Lamp Is Off) Wheels Stop Spinning (ATC Lamp Goes Out) Excessive Wheel Spin ATC Operational (ATC Lamp Comes On)

ATC turns itself on and drivers do not have to select this feature. If the drive wheels spin during acceleration, the ATC indicator lamp comes on, indicating ATC is active. It goes out when the drive wheels stop spinning.

ATC Automatic Traction Control:
ATC is an option available on ABS-equipped vehicles. It helps improve traction when vehicles are on slippery road surfaces by reducing wheel over-spin. ATC works automatically in two ways.

If a drive wheel starts to spin, ATC applies air pressure to that wheel and applies brake. This transfers engine torque to the wheel with better traction.

If both drive wheels spin, ATC reduces engine torque to provide better traction.

There is also a dash mounted switch for use in deep snow or mud. This function increases available traction on extra soft surfaces by slightly increasing the permissible wheel spin. This function is not automatic and is not designed for constant use. The ATC lamp blinks constantly when the switch is activated. Always refer to the vehicles operators' manual for these and other components.

Rationale: Each bus may have different types of switches and systems; they may be located in different places and may be activated differently.

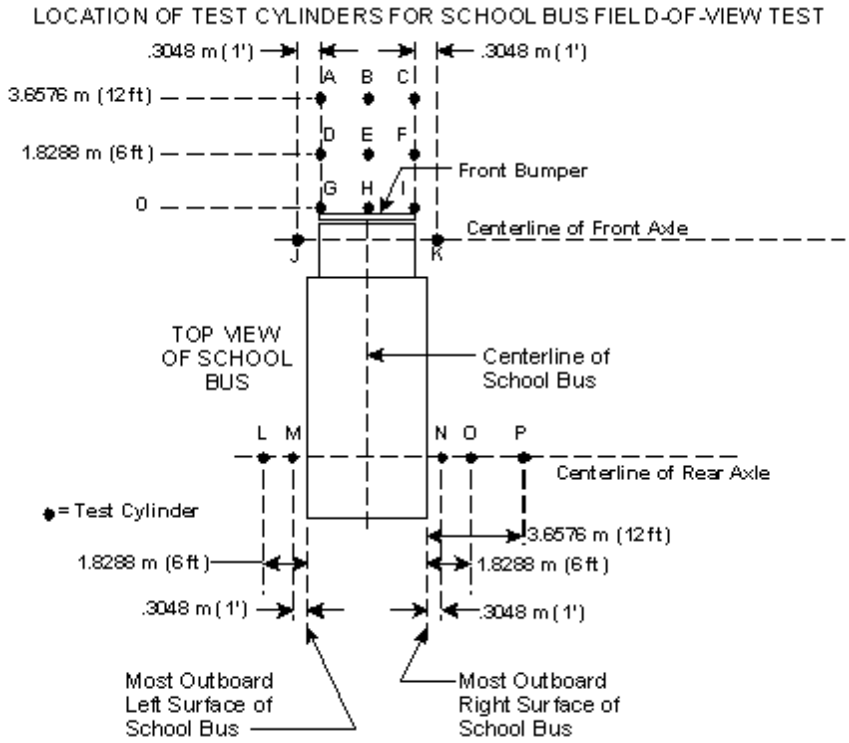
Seat Controls:

- Adjust the seat so that all controls can be operated properly.
  Rationale: Be sure to lock the seat into proper position to prevent the seat from moving forward and backwards as to ensure the operator will

be able to maintain control of steering, braking and acceleration.

- Fasten and adjust driver safety restraint (dsr), which is to be worn at all times when bus is in use.
- Check for correct mirror adjustment.

Rationale: Proper adjustment and use of all mirrors is vital to safe operation of the school bus, in order to observe the danger zones around the bus and look for students, traffic and other objects In the danger zones of the bus. Check each mirror to ensure maximum viewing area is attained. If necessary have mirrors adjusted. Per FMVSS 111



STARTING THE ENGINE:

- Assure that parking brake is set.
- Release the ignition interlock/vandal lock. If equipped

  Rationale: If Interlock/vandal lock is not released the bus will not Start

- Depress clutch pedal to disengage it from the engine, if transmission is manual.
- Shift gear lever into neutral position.

  Rationale: Buses will not start unless they are placed in neutral

- Turn on ignition key to complete electric circuits and follow dash instructions.

Rationale: Some buses are equipped with a wait to start light. While other buses may have some type of symbol in the dash that represents the wait to start light and if the operator attempts to start the bus before the light/symbol directs the operator to the bus will be hard to start.

- Engage starter switch with clutch depressed and gear shift in neutral.
- Use foot accelerator sparingly. Every effort should be taken into consideration during vehicle operation.
- Bus engines will vary widely in sensitivity; therefore, do not hesitate to ask the supervisor or bus mechanic for special techniques in starting a particular bus.
- Warm up engine at fast idle; do not race the engine.
- Check all instruments to see that all are registering properly:

Idling of School Buses:

In normal weather, a school bus operator shall not idle the bus while waiting for or loading students. Buses will be allowed to idle when the temperature is 40 degrees Fahrenheit or colder, when the driving windows need to be defrosted, when the safety or comfort of the students is in question.

School bus operators are prohibited from idling the buses for more than 10 minutes unless defrosting of windows is needed, in this case idling shall be limited to thirty minutes

Releasing the Park Brake:

Inform the trainee that the Park brake will not release until the system has attained at least 60PSI, and on some models the park brake will not release unless the ignition key is in the run position.

Rationale: Some buses will release the park brake simply by pushing the Park Brake knob in (release position), While some buses have to have the key on and the foot brake applied in order to release the Park Brake.

Accelerating:

These guide lines are to be used when pulling out from a stop, whether the vehicle is on a level road way or pulling out on grade.

- Don't roll back when you start. You may hit someone or someone's vehicle behind you. If you have a manual transmission vehicle, partly engage the clutch before you take your foot off the brake.
- Put on the parking brake whenever necessary to keep from rolling back. Release the parking brake only when you have applied enough engine power to keep from rolling back.
- Speed up smoothly and gradually so the vehicle does not jerk. Rough acceleration can cause mechanical damage.

- Speed up gradually when traction is poor, when you are on rain or snow covered roads. If you use too much power, the drive wheels may spin. You could lose control or If the drive wheels begin to spin, take your foot off of the accelerator.
- The driver should not coast (foot on clutch or gearshift in neutral).The driver does not stall the engine and accelerates smoothly and merges with other traffic into proper lane using appropriate speed of engine.

  Rationale: Accelerating and merging properly prevents the vehicle from interfering with the flow of traffic. Accelerating too quickly may damage equipment, which in turn cause the vehicle to stall or break down.

Shifting gears:

Correct shifting of gears is important. If you can't get your vehicle into the right gear while driving, you will have less control.

Basic Method for Shifting Up. Most heavy vehicles with manual transmissions require double clutching to change gears. This is the basic method:

- Release accelerator, push in clutch and shift to the transmission into neutral at the same time.
- Release clutch. Let engine and gears slow down to the rpm required for the next gear (this takes practice).
- Push in clutch and shift to the higher gear at the same time.
- Release clutch and press accelerator at the same time.

- Shifting gears using double clutching requires practice. If you remain too long in neutral, you may have difficulty putting the vehicle into the next gear. If so, don't try to force it. Return to neutral, release clutch, increase engine speed to match road speed, and try again.

Knowing When to Shift Up. There are two ways of knowing when to shift:

- **Use Engine Speed (rpm).** Study the driver's manual for your vehicle and learn the operating rpm range. Watch your tachometer, and shift up when your engine reaches the top of the rpm range. (Some newer vehicles use "progressive" shifting: The rpm at which you shift becomes higher as you move up in the gears. Find out what's right for the vehicle you will operate.)
- **Use Road Speed (mph).** Learn what speeds each gear is good for. Then, by using the speedometer, you'll know when to shift up.

With either method, you may learn to use engine sounds to know when to shift the transmission.

Basic Procedures for Shifting Down

- Release accelerator, push in clutch, and shift to neutral at the same time.
- Release clutch.

- Press accelerator, increase engine and gear speed to the rpm required in the lower gear.
- Push in clutch and shift to lower gear at the same time.
- Release clutch and press accelerator at the same time.
- Downshifting, like up-shifting, requires knowing when to shift. Use either the tachometer or the speedometer and downshift at the right rpm or road speed.
- Special conditions where you should downshift are:
  a. **Before Starting Down a Hill.** Slow down and shift down to a speed that you can control without using the brakes hard. Otherwise the brakes can overheat and lose their braking power. Downshift before starting down the hill. Make sure you are in a low enough gear, usually lower than the gear required to climb the same hill.
  b. **Before Entering a Curve.** Slow down to a safe speed, and downshift to the right gear before entering the curve. This lets you use some power through the curve to help the vehicle be more stable while turning. It also allows you to speed up as soon as you are out of the curve

     Rationale: Drivers must adjust speed to safely negotiate a curve. Drivers inexperienced with the operation of a school bus often misjudge the maximum speed with which they can negotiate a curve radius. Excessive speed prior to the curve requires hard braking in the curve which could create a hazardous condition. At the other extreme, drivers whose handling skills are deficient may slow too much to keep the vehicle in the lane while negotiating the curve. Speed adjustments need to be made prior to the curve to allow the driver time to concentrate on the curve and not on shifting.

Also you make sure that the operator keeps the vehicle wheels in the proper lane.

Rationale; Because of off tracking/tail-swing driver must approach the curve from an outside position of the lane to keep the rear wheels from cutting across the apex of the curve. Failure to do so can cause the rear wheels to leave the road or present a hazard in the neighboring lane.

Automatic Transmissions

Some vehicles have automatic transmissions. You can select a low range to get greater engine braking when going down grades. The lower ranges prevent the transmission from shifting up beyond the selected gear (unless the governor rpm is exceeded). It is very important to use this braking effect when going down grades also.

Basic Braking procedures

The Driver must be taught proper braking techniques. These techniques are:

Rationale: Drivers unskilled at operating vehicles with air brakes will have a tendency to over-brake causing harsh and erratic stops.

- Push the brake pedal down gradually. The amount of brake pressure you need to

sop the vehicle will depend on the speed of the vehicle and how quickly you need to stop. Control the pressure so the vehicle comes to a smooth, safe stop. If you have a manual transmission, push the clutch in when the engine is close to idle.

- Brakes are designed so brake shoes or pads rub against the brake drum or disks to slow the vehicle.
- Braking creates heat, but brakes are designed to take a lot of heat. However, brakes can fade or fail from excessive heat caused by using them too much and not relying on the engine braking effect.
- Excessive use of the service brakes results in overheating and leads to brake fade.
- Brake fade results from excessive heat causing chemical changes in the brake lining, which reduce friction, causing expansion of the brake drums.
- As the overheated drums expand, the brake shoes and linings have to move farther to contact the drums, and the force of this contact is reduced.
- Continued overuse may increase brake fade until the vehicle cannot be slowed down or stopped.
- Brake fade is also affected by adjustment. To safely control a vehicle, every brake must do its share of the work.
- Brakes out of adjustment will stop doing their share before those that are in adjustment. The other brakes can then overheat and fade, and there will not be enough braking available to control the vehicle(s).
- Brakes can get out of adjustment quickly, especially when they are hot. Therefore, check brake adjustment often.
- Remember, the use of brakes 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, the following is the proper braking technique:
  a. Apply the brakes just hard enough to feel a definite slowdown.
  b. When your speed has been reduced to approximately five mph below your "safe" speed, release the brakes. (This application should last for about three seconds.)
  c. When your speed has increased to your "safe" speed, repeat steps 1 and 2.
  d. For example, if your "safe" speed is 40 mph, you would not apply the brakes until your speed reaches 40 mph. You now apply the brakes hard enough to gradually reduce your speed to 35 mph and then release the brakes. Repeat this as often as necessary until you have reached the end of the downgrade.

Caution: Applying the park brake when the brakes are over heated may cause damage, however do not leave the vehicle unattended without setting the park brake.

Low Air Pressure:

If the low air pressure warning comes on, stop and safely park your vehicle as soon as possible.

There might be an air leak in the system. Controlled braking is possible only while enough air remains in the air tanks.

The spring brakes will come on when the air pressure drops into the range of 20 to 45 psi. A heavily loaded vehicle will take a long distance to stop because the spring brakes do not work on all axles. Lightly loaded vehicles or vehicles on slippery roads may skid out of control when the spring brakes come on. It is much safer to stop while there is enough air in the tanks to use the foot brakes.

Parking Brakes:

Any time you park, or are loading or unloading students use the parking brakes, except as noted below.

Pull the parking brake control knob out to apply the parking brakes, push it in to release.

The control will be a yellow, diamond shaped knob labeled "parking brakes" on newer vehicles.

On older vehicles, it may be a round blue knob or some other shape (including a lever that swings from side to side or up and down).

Note: Do not apply the park brake until the vehicle has come to a complete stop.

If your vehicle does not have automatic air tank drains, drain your air tanks at the end of each working day to remove moisture and oil. Otherwise, the brakes could fail.

Never leave your vehicle unattended without applying the parking brakes or chocking the wheels. Your vehicle might roll away and cause injury and damage.

Antilock Braking Systems

Vehicles Required to Have Antilock Braking Systems
The Department of Transportation requires that antilock braking systems are on:
Air brakes vehicles, (trucks, buses, trailers and converter dollies) built on or after March 1, 1998.

Hydraulically braked buses with a gross vehicle weight rating of 10,000 lbs or more built on or after March 1, 1999.

Many buses built before these dates have been voluntarily equipped with ABS.

Your school bus will have a yellow ABS malfunction lamp on the instrument panel if it is equipped with ABS.

How ABS Helps You
When you brake hard on slippery surfaces in a vehicle without ABS, your wheels may lock up.

When your steering wheels lock up, you lose steering control. When your other wheels lock up, you may skid or even spin the vehicle.

ABS helps you avoid wheel lock up and maintain control. You may or may not be able to stop faster with ABS, but you should be able to steer around an obstacle while braking, and avoid skids caused by over braking.

Braking with ABS:
When you drive a vehicle with ABS, you should brake as you always have. In other words:

Use only the braking force necessary to stop safely and stay in control. Brake the same way, regardless of whether you have ABS on the bus. However, in emergency braking, do not pump the brakes on a bus with ABS.

As you slow down, monitor your bus and back off the brakes (if it is safe to do so) to stay in control.

Braking if ABS is Not Working
Without ABS, you still have normal brake functions. Drive and brake as you always have.

Vehicles with ABS have yellow malfunction lamps to tell you if the ABS is not working properly. The yellow ABS malfunction lamp is on the bus's instrument panel.

As a system check on newer vehicles, the malfunction lamp comes on at start-up for a bulb check and then goes out quickly. On older systems, the lamp could stay on until you are driving over five mph.

If the lamp stays on after the bulb check, or goes on once you are under way, you may have lost ABS control at one or more wheels.

Remember, if your ABS malfunctions, you still have regular brakes. However you should have the vehicle serviced immediately upon completion of your route/trip.

Rationale: It could be an indication of a developing mechanical issue.

Safety Reminders
ABS won't allow you to drive faster, follow more closely, or drive less carefully.

ABS won't prevent power or turning skids–ABS should prevent brake-induced skids but not those caused by spinning the drive wheels or going too fast in a turn.

ABS won't necessarily shorten stopping distance. ABS will help maintain vehicle control, but not always shorten stopping distance.

ABS won't increase or decrease ultimate stopping Power–ABS is an "add-on" to your normal brakes, not a replacement for them.

ABS won't change the way you normally brake. Under normal brake conditions, your vehicle will stop as it always stopped. ABS only comes into play when a wheel would normally have locked up because, of over braking.

ABS won't compensate for bad breaks or poor brake maintenance.

Remember: The best vehicle safety feature is still a safe driver.

Auxiliary brake/retarders

Engine Brakes: *There are two basic types of engine brakes*.

The most common uses a butterfly valve mounted in the exhaust pipe to restrict the flow of the exhaust gases. Other engine manufactures are using the turbocharger to serve the same purpose.
The other method of engine braking is to use the engines compression to retard the engine. All engine brakes are controlled with a dash mounted switch to turn them on or off, some may even have a switch to turn them on or off, some may even have a switch that control the level of the engine braking. When the engine brake is in operation it works with the ABS brake system to help in the braking effort. The use of the engine brake on long steep grades will greatly reduce the chance of brake failure due to brake fade, and if it is used on a regular basis will greatly extend the life of the vehicle primary brake shoes.

The only time the engine brake should not be used is when driving on road surfaces with low traction. The engine brake should never be considered as the vehicle primary braking system, but when used together with the service brake it adds an extra level of safety to the vehicle.

Some vehicles also have driveline "retarders." These retarders help slow a vehicle, by reducing the need for using your brakes. They reduce brake wear.

All retarders can be turned on or off by the driver. On some vehicles the retarding power can be adjusted. When turned "on," retarders apply their braking power (to the drive wheels only), when you let up on the accelerator pedal all the way.

Caution: When your drive wheels have poor traction, the retarder may cause them to skid. Therefore, you should turn the retarder off whenever the road is wet, icy, or snow

covered. However if the vehicle is equipped with an auxiliary brake system the driver should receive the proper training on the use of this system

BASIC VEHICLE SKILLS

BACKING IN A STRAIGHT LINE

Backing will be practiced and may be necessary, however use an adult Helper if at all possible.

> Use a helper when you can. There are blind spots you can't see. That's why a helper is important. The helper should stand near the back of your vehicle where you can see the helper. Before you begin backing, work out a set of hand signals that you both understand. Agree on a signal for "stop

Backing Safely

Because you cannot see everything behind your vehicle, backing is always dangerous. Avoid backing whenever you can. When you park, try to park so you will be able to pull forward when you leave. When you have to back, here are a few simple safety rules:

- Start in the proper position.
- Look at your path.
- Use mirrors on both sides.
- Back slowly.
- Back and turn toward the driver's side whenever possible.

Start in the Proper Position.

Put the vehicle in the best position to allow you to back safely. This position will depend on the type of backing to be done.

Look at Your Path. Look at your line of travel before you begin. Get out and walk around the vehicle. Check your clearance to the sides and overhead, in and near the path your vehicle will travel.

Use Mirrors on Both Sides. Check the outside mirrors on both sides frequently. Get out of the vehicle and check your path if you are unsure.

Back Slowly. Always back as slowly as possible. Use the lowest reverse gear. That way you can more easily correct any steering errors. You also can stop quickly if necessary.

When possible Back and Turn Toward the Driver's Side. Back to the driver's side so you can see better.

Backing toward the right side is very dangerous because you can't see as well. If you back and turn toward the driver's side, you can watch the rear of your vehicle by looking out the side window.

Use driver side backing--even if it means going around the block to put your vehicle in this position. The added safety is worth it.

Back/Right:
Back into a space that is to the right rear of your vehicle. Practice right backing in a defined area as not to encroach on the boundaries.

Rationale: This can be done in a coned area or an actual turning area.

Back/Left:
Back into a space that is to the left rear of your vehicle. Practice left backing in a defined area as not to encroach on the boundaries.

Rationale: This can be done in a coned area or an actual turning area.

Alley dock:
You will practice sight-side backing your vehicle into an alley, bringing the rear of your vehicle as close as possible to the rear of the alley without going beyond the exercise boundary marked by a line or row of cones. You are required to get your vehicle completely into the space with your entire vehicle straight with the alley.

ONROAD DRIVING

TURNS

You will be required to make a turn:

- Check traffic in all directions.
- Use turn signals and safely get into the lane needed for the turn.
- As you approach the turn:
  a. Use turn signals to warn others of your turn.
  b. Slow down smoothly, change gears as needed to keep power, but do not coast unsafely. Unsafe coasting occurs when your vehicle is out of gear (clutch depressed or gearshift in neutral) for more than the length of your vehicle.
- If you must stop before making the turn:
  a. Come to a smooth stop without skidding.
  b. Come to a complete stop behind the stop line, crosswalk, or stop sign.
- If stopping behind another vehicle, stop where you can see the rear tires on the vehicle ahead of you (safe gap).

  Rationale: The driver should allow enough space to maneuver the vehicle in case of emergency or stalled traffic
- Do not let your vehicle roll. Keep the front wheels aimed straight ahead.

  Rationale: You want to keep the wheels pointed straight ahead in the event that the vehicle is struck from the rear. The driver can maintain better control of the vehicle.
- Check traffic in all directions.
- Keep both hands on the steering wheel during the turn.
- Do not change gears during the turn.
- Keep checking your mirror to make sure the vehicle does not hit anything on the inside of the turn.
- Vehicle should not move into oncoming traffic.
- Vehicle should finish turn in correct lane.
- After turn:
  a. Make sure turn signal is off.
  b. Get up to speed of traffic, use turn signal, and move into right-most lane when safe to do so (if not already there).
  c. Check mirrors and traffic.

Right Turns. Here are some rules to help prevent right-turn crashes:

- Turn slowly to give yourself and others more time to avoid problems.
- When you are driving a bus that cannot make the right turn without swinging into another lane, turn wide as you complete the turn. Keep the rear of your vehicle close to the curb. This will stop other drivers from passing you on the right.

- Don't turn wide to the left as you start the turn. A following driver may think you are turning left and try to pass you on the right. You may crash into the other vehicle as you complete your turn.
- If you must cross into the oncoming lane to make a turn, watch out for vehicles coming toward you. Give them room to go by or to stop. However, don't back up for them, because you might hit someone behind you. See Figure 2.13.

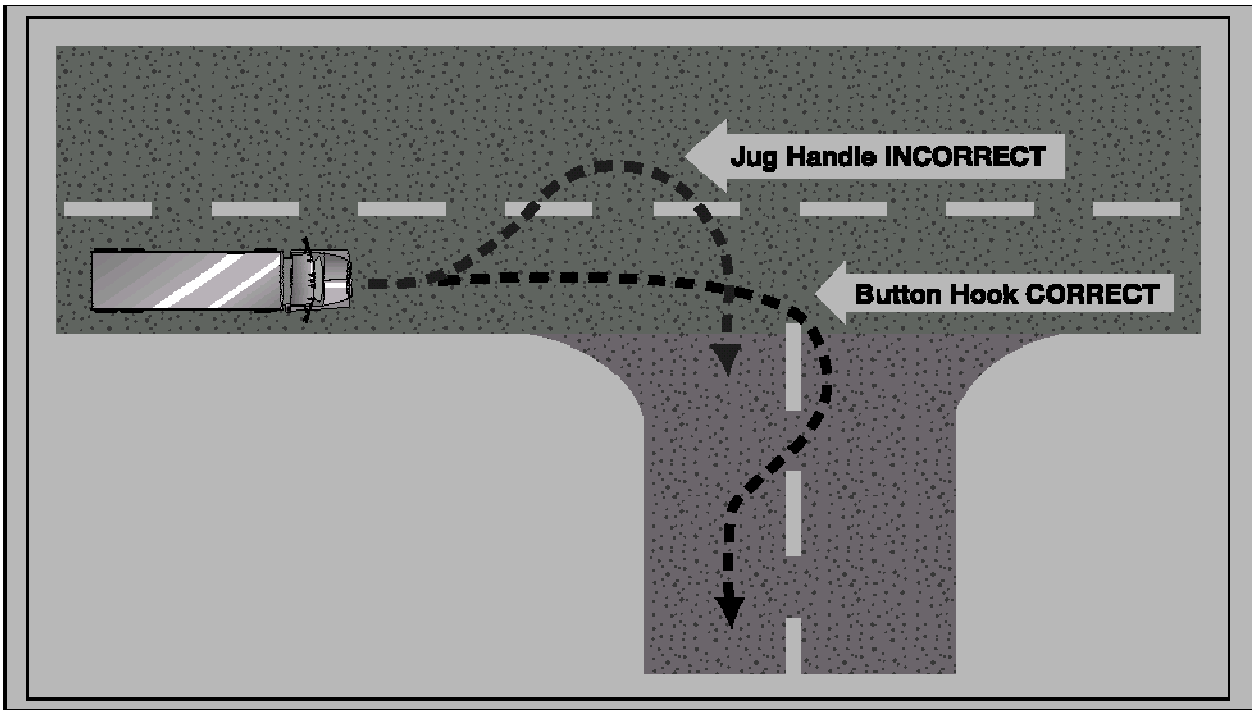


Figure 2.13

Left Turns. On a left turn, make sure you have reached the center of the intersection before you start the left turn. If you turn too soon, the left side of your vehicle may hit another vehicle because of offtracking.

If there are two turning lanes, always take the right turn lane. Don't start in the inside lane because you may have to swing right to make the turn. Drivers on your left can be more readily seen. See Figure 2.14.

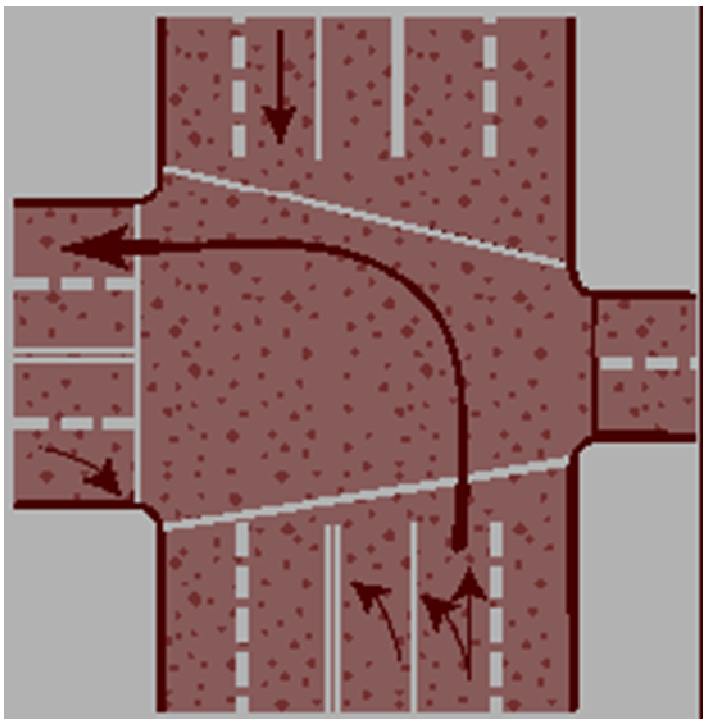


Figure 2.14

INTERSECTIONS

As you approach an intersection:

- Check traffic thoroughly in all directions. Decelerate gently.
- Brake smoothly and**, if necessary**, change gears.
- If necessary, come to a complete stop behind any stop signs, signals, sidewalks, or stop lines maintaining a safe gap.

  Rationale: Making a full stop allows the driver enough time to thoroughly observe the traffic environment around the vehicle. Also, make sure that there is sufficient space between the vehicle and the sidewalks while making turns. You do not want to rub, scrape or climb the sidewalk with the vehicle a pedestrian could be caught and injured and the tires could be damaged.
- Your vehicle must not roll forward or backward.
- When driving through an intersection:
  a. Check traffic thoroughly in all directions.
  b. Decelerate and yield to any pedestrians and traffic in the intersection.
- Do not change lanes or shift gears while proceeding through the intersection. Keep your hands on the wheel.

Once **through** the intersection:

- Continue checking mirrors and traffic.
- Accelerate smoothly and change gears as necessary.

Urban/Rural Straight:
You will be expected to make regular traffic checks and maintain a safe following distance. Your vehicle should be centered in the proper lane (right-most lane) and you should keep up with the flow of traffic but not exceed the posted speed limit.

Also when encountering (driving upon) emergency vehicles you should slow your vehicle, use proper procedure and move your vehicle into the left lane if safe to do so.

Rural Driving–*Lane Changes*
During multiple lane portions you will be asked to change lanes to the left, and then back to the right. You should make the necessary traffic checks first, then use proper signals and smoothly change lanes when it is safe to do so.

> Rationale: Traffic checks should be made constantly including mirror checks around the vehicle. This is necessary to keep the driver alert to any changes in traffic and road conditions. Mirror checks are critical because of the vehicles large blind spots. The driver must be continually aware of conditions so that necessary adjustments in speed and position can be made. These adjustments take longer in school buses because of their large sizes, so the driver must be able to anticipate them as early as possible.

Expressway
Before entering the expressway:

- Check traffic.
- Use proper signals.
- Merge smoothly into the proper lane of traffic.

Off Ramps/On Ramps.
Freeway and turnpike exits can be particularly dangerous for commercial vehicles.

Off ramps and on ramps often have speed limit signs posted. Remember, these speeds may be safe for automobiles, but may not be safe for larger vehicles or heavily loaded vehicles.

Exits that go downhill and turn at the same time can be especially dangerous.

The downgrade makes it difficult to reduce speed. Braking and turning at the same time can be a dangerous practice.

Make sure you are going slow enough before you get on the curved part of an off ramp or on ramp.

Space Needed to Cross or Enter Traffic:
Be aware of the size and weight of your vehicle when you cross or enter traffic. Here are some important things to keep in mind.

Because of slow acceleration and the space large vehicles require, you may need a much larger gap to enter traffic than you would in a car.

Acceleration varies with the load. Allow more room if your vehicle is heavily loaded.

Before you start across a road, make sure you can get all the way across before traffic reaches you.

Once on the expressway:

- Maintain proper lane positioning, vehicle spacing, and vehicle speed.
- Continue to check traffic thoroughly in all directions.
- When exiting the expressway:
- Make necessary traffic checks.
- Use proper signals.
- Decelerate smoothly in the exit lane.
- Once on the exit ramp, you must continue to decelerate within the lane markings and maintain adequate spacing between your vehicle and other vehicles.

Stop/Start:

Rationale: These guide lines are to be used when pulling out from a stop, whether the vehicle is on a level road way or pulling out on grade.

You may be asked to pull your vehicle over to the side of the road and stop as if you were going to get out and check something on your vehicle. You must check traffic thoroughly in all directions and move to the right-most lane or shoulder of road.

Rationale: Don't roll back when you start. You may hit someone behind you. If you have a manual transmission vehicle, partly engage the clutch before you take your right foot off the brake.

As you prepare for the stop:

- Check traffic.
- Activate your right turn signal.
- Decelerate smoothly, brake evenly, change gears as necessary.
- Bring your vehicle to a full stop without coasting.
- Once stopped:
- Vehicle must be parallel to the curb or shoulder of the road and safely out of the traffic flow.
- Vehicle should not be blocking driveways, fire hydrants, intersections, signs, etc. Cancel your turn signal.
- Activate your four-way emergency flashers.
- Apply the parking brake.
- Move the gear shift to neutral or park.
- Remove your feet from the brake and clutch pedals.
- When instructed to resume:
  a. Check traffic and your mirrors thoroughly in all directions.

b. Turn off your four-way flashers.
c. Activate the left turn signal.
d. When traffic permits, you should release the parking brake and pull straight ahead.
e. Do not turn the wheel before your vehicle moves.
f. Check traffic from all directions, especially to the left.
g. Steer and accelerate smoothly into the proper lane when safe to do so.
h. Once your vehicle is back into the flow of traffic, cancel your left turn signal.

Curve
When approaching a curve:

- Check traffic thoroughly in all directions.
- Before entering the curve, reduce speed so further braking or shifting is not required in the curve.
- Keep vehicle in the lane.
- Continue checking traffic in all directions.

Railroad-highway Crossings
Types of Crossings

Passive Crossings. This type of crossing does not have any type of traffic control device. You must stop at these crossings and follow proper procedures. However, the decision to proceed rests entirely in your hands. Passive crossings require you to recognize the crossing, search for any train using the tracks and decide if there is sufficient clear space to cross safely. Passive crossings have yellow circular advance warning signs, pavement markings and cross-bucks to assist you in recognizing a crossing.

Active Crossings. This type of crossing has a traffic control device installed at the crossing to regulate traffic at the crossing. These active devices include flashing red lights, with or without bells and flashing red lights with bells and gates.

Warning Signs and Devices **Advance Warning Signs.** The round, black-on yellow warning sign is placed ahead of a public railroad-highway crossing. The advance warning sign tells you to stop, look and listen for the train. See Figure 10.5.

Figure 10.5

Pavement Markings. Pavement markings mean the same as the advance warning sign. They consist of an “X” with the letters “”RR” and a no passing marking on two-lane roads.

There is also a no passing zone sign on two-lane roads. There may be a white stop line painted on the pavement before the railroad tracks. The front of the school bus must remain behind this line while stopped at the crossing. See Figure 10.6.

Figure 10.6

Crossbuck Signs. This sign marks the crossing. It requires you to yield the right-of-way to the train. If there is no white line painted on the pavement, you must stop the bus before the crossbuck sign.

When the road crosses over more than one set of tracks, a sign below the crossbuck indicates the number of tracks. See Figure 10.7

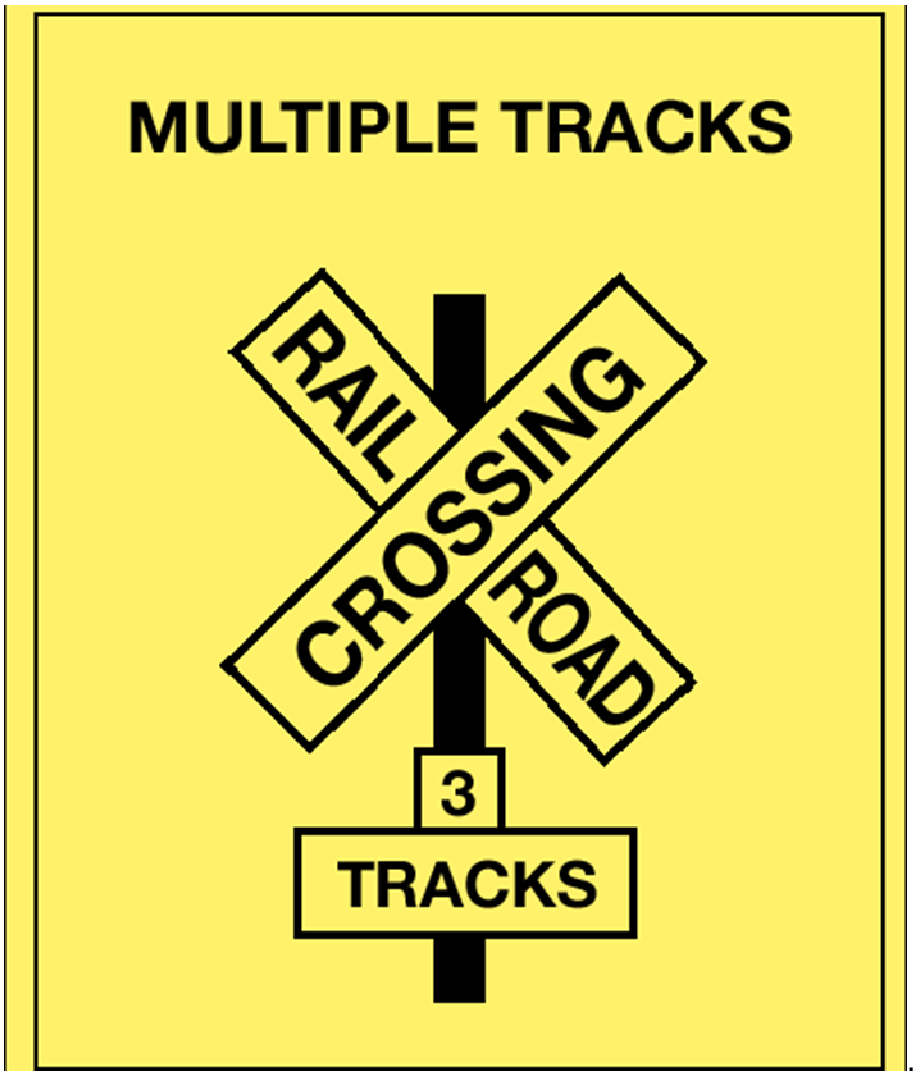


Figure 10.7

Flashing Red Light Signals. At many highway rail grade crossings, the crossbuck sign has flashing red lights and bells. You are required to stop! A train is approaching. You are required to yield the right-of-way to the train. If there is more than one track, make sure all tracks are clear before crossing. If the gate stays down after the train passes, do not drive around the gate. Instead, call your dispatcher. See Figure 10.8.

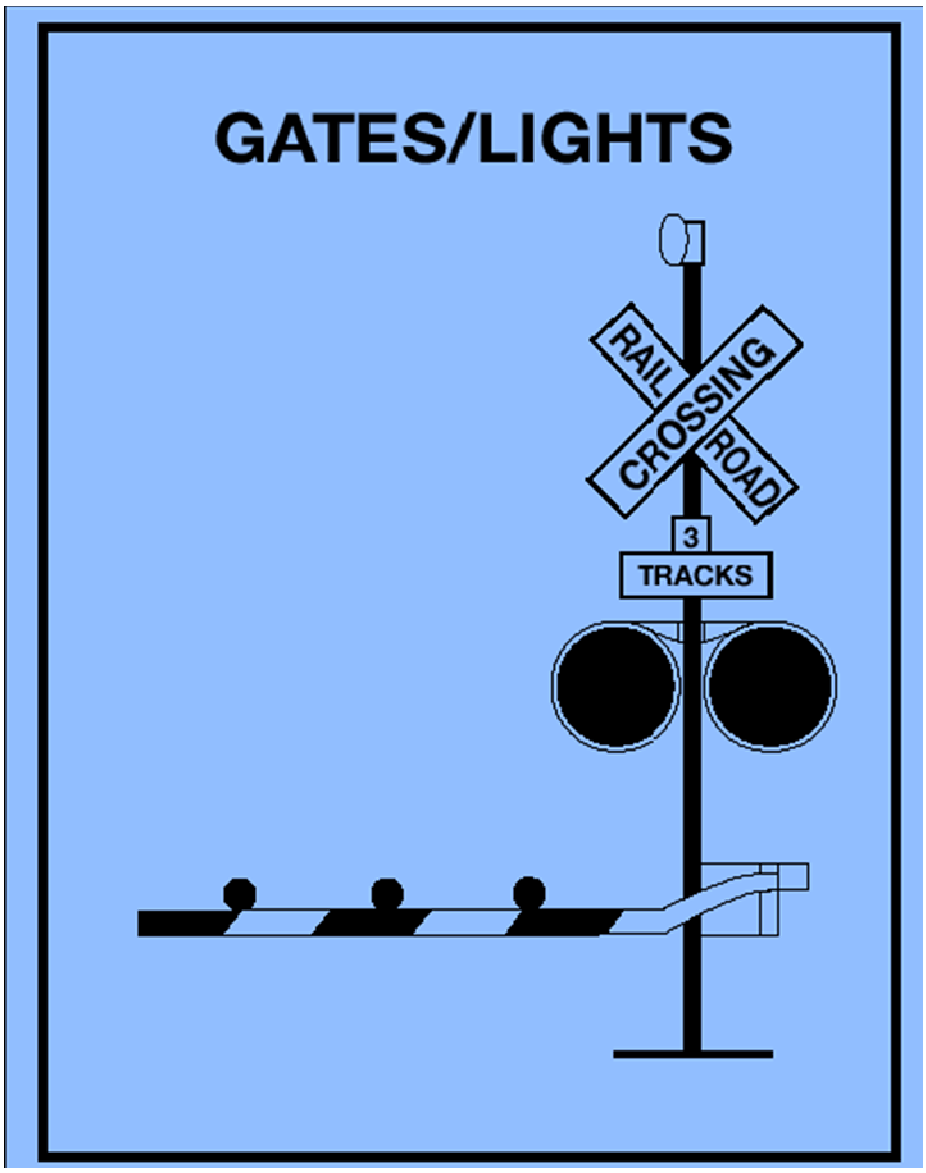


Figure 10.8

Gates. Many railroad-highway crossings have gates with flashing red lights and bells. Remember that buses are required to stop at all Rail Road crossing. Remain stopped until the gates go up and the lights have stopped flashing. Proceed when it is safe. If the gate stays down after the train passes, do not drive around the gate. Instead, call your dispatcher. See Figure 10.8.

Recommended Procedures

Each state has laws and regulations governing how school buses must operate at railroad-highway crossings.

- In general, school buses must stop at all crossings, and ensure it is safe before
- proceeding across the tracks.
- A school bus is one of the safest vehicles on the highway.

- However, a school bus does not have the slightest edge when involved in a crash with a
- train.
- Because of a train's size and weight it cannot stop quickly. A freight train with 150 cars traveling at 50 MPH would continue moving down the track for 1.5 miles before coming to a complete stop, even with full emergency braking. An emergency stop requires approximately 17 seconds for air brakes on all train cars to activate, and a train does not have an emergency escape route
- A school bus, under ideal conditions, should be able to come to a complete stop in approximately 12 seconds when following the proper procedures.
- Always assume that a train is coming, even when there is no warning given. Familiarity with rail road crossing on a route is an important aspect of safe transportation.
- Avoid becoming over confident. Remember most trains run a variable schedule and travel at different speeds.
- You can prevent school bus/train crashes by following these recommended procedures.
- Approaching the Crossing:
  a. Slow down, including shifting to a lower gear in a manual transmission bus, and test your brakes.
  b. Activate hazard lights approximately 200 feet before the crossing. Make sure your intentions are known.
  c. Scan your surroundings and check for traffic behind you.
  d. Stay to the right of the roadway if possible.
  e. Choose an escape route in the event of a brake failure or problems behind you.
- At the Crossing:
  a. Stop no closer than 15 feet and no farther than 50 feet from the nearest rail, where you have the best view of the tracks.
  b. Place the transmission in Park, or if there is no Park shift point, in Neutral and press
  c. down on the service brake or set the parking brakes.
  d. Turn off all radios and noisy equipment, and silence the passengers. Open the service door and driver's window. Look and listen for an approaching train.
- **Before crossing the tracks close your entrance door**

Crossing the Track:

- Check the crossing signals again before proceeding.
- At a multiple-track crossing, stop only before the first set of tracks. When you are sure no train is approaching on any track, proceed across all of the tracks until you have completely cleared the all of the tracks.
- Cross the tracks in a low gear. Do not change gears while crossing.
- If the gate comes down after you have started across, drive through it even if it means you will break the gate.

- After crossing the tracks and you are sure that the bus has cleared the tracks close the driver's window and turn the emergency flashers off and continue your route.

Special Situations

If a train is in sight, or if any warning signals are activated, a loaded school bus cannot attempt to cross the tracks.

Bus Stalls or Trapped on Tracks. If your bus stalls or is trapped on the tracks, get everyone out and off the tracks immediately. Move everyone a safe distance far from the bus at an angle away from the tracks. If a train is approaching move at angle away from the tracks and in the direction of the approaching train.

If the crossing is occupied by a train, the bus driver must set the parking brake and place the gear shift in the neutral position until the crossing is clear.

Police Officer at the Crossing. If a police officer is at the crossing, obey directions. If there is no police officer, and you believe the signal is malfunctioning, call your dispatcher to report the situation and ask for instructions on how to proceed.

Obstructed View of Tracks. Plan your route so it provides maximum sight distance at highway-rail grade crossings.

Do not attempt to cross the tracks unless you can see far enough down the track to know for certain that no trains are approaching.

Passive crossings are those that do not have any type of traffic control device. Be especially careful at "passive" crossings.

Even if there are active railroad signals that indicate the tracks are clear, you must stop look and listen to be sure it is safe to proceed.

Containment or Storage Areas.
If it won't fit, don't commit!
Know the length of your bus and the size of the containment area at highway-rail crossings on the school bus route, as well as any crossing you encounter in the course of a school activity trip.

When approaching a crossing beware of anything that would prevent the bus from completely clearing the track (S) such as a signal or stop sign on the opposite side, pay

attention to the amount of room there. Be certain the bus has enough containment or storage area to completely clear the railroad tracks on the other side if there is a need to stop.

A school bus is at most 45 feet long, and requires 15 feet of clearance in front and in back, for a total of 70 feet for the bus to safely clear the track.

As a general rule add a minimum of 15 feet to the length of the school bus to determine an acceptable amount of containment or storage area.

Danger Zones and Use of Mirrors:

Because state and local laws and regulations regulate so much of school transportation and school bus operations, many of the procedures in this section may differ from state to state. You should be thoroughly familiar with the laws and regulations in your state and local school district.

Danger Zones

The danger zone is the area on all sides of the bus where children are in the most danger of being hit, either by another vehicle or their own bus. The danger zones may extend as much as 30 feet from the front bumper with the first 10 feet being the most dangerous, 10 feet from the left and right sides of the bus and 10 feet behind the rear bumper of the school bus. In addition, the area to the left of the bus is always considered dangerous because of passing cars. Figure 10.1 illustrates these danger zones.

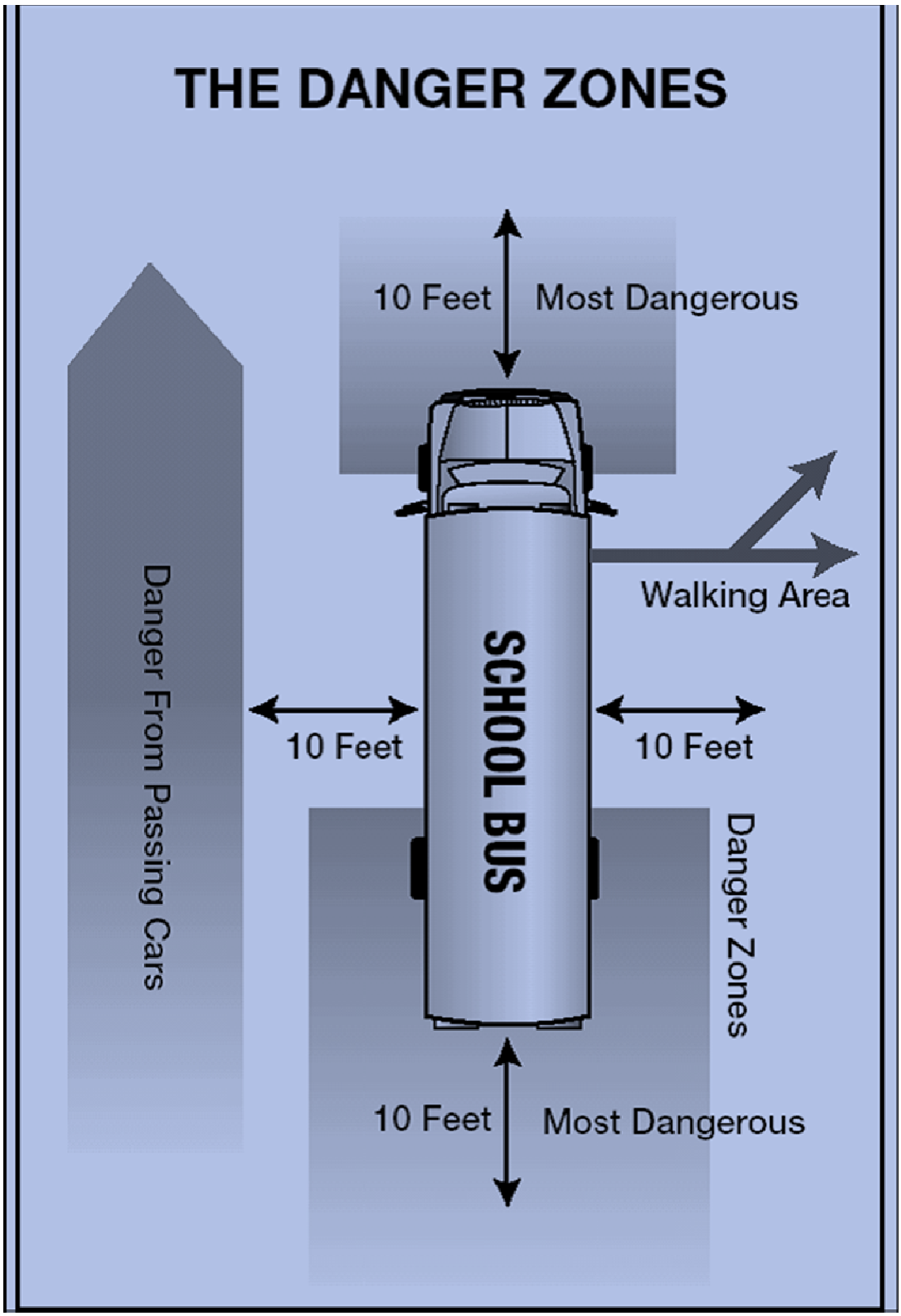

THE DANGER ZONES
10 Feet
Most Dangerous
Walking Area
Danger From Passing Cars
SCHOOL BUS
10 Feet
10 Feet
Danger Zones
10 Feet
Most Dangerous

Figure 10.1

Correct Mirror Adjustment
Proper adjustment and use of all mirrors is vital to the safe operation of the school bus in order to observe the danger zone around the bus and look for students, traffic, and other objects in this area. You should always check each mirror before operating the school bus to obtain maximum viewing area. If necessary, have the mirrors adjusted.

Outside Left and Right Side Flat Mirrors
These mirrors are mounted at the left and right front corners of the bus at the side or front of the windshield. They are used to monitor traffic, check clearances and students on the sides and to the rear of the bus. There is a blind spot immediately below and in front of each mirror and directly in back of the rear bumper. The blind spot behind the bus extends 5o to 150 feet and could extend up to 400 feet depending on the length and width of the bus.

Ensure that the mirrors are properly adjusted so you can see:

- 200 feet or 4 bus lengths behind the bus.
- Along the sides of the bus.
- The rear tires touching the ground.
- Figure 10.2 shows how both the outside left and right side flat mirrors should be adjusted.

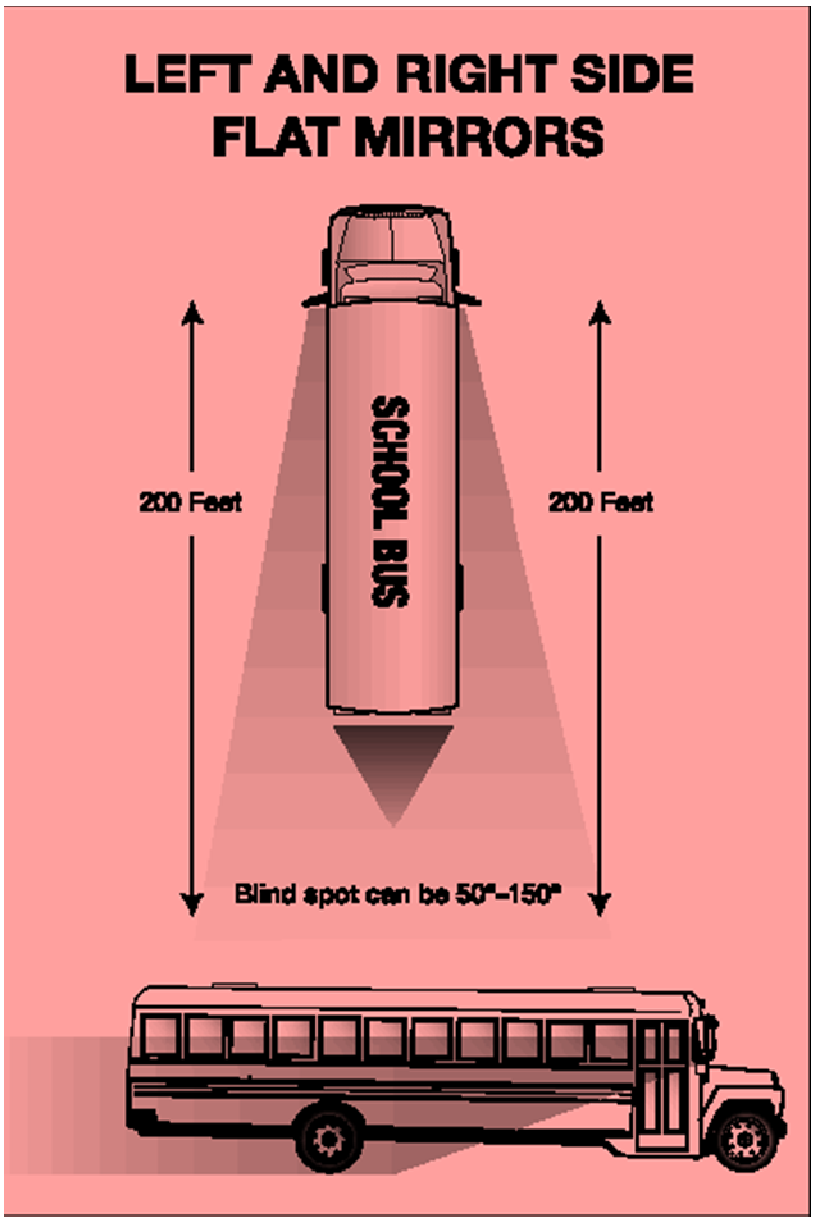


Figure 10.2

Outside Left and Right Side Convex Mirrors

The convex mirrors are located below the outside flat mirrors. They are used to monitor the left and right sides at a wide angle. They provide a view of traffic, clearances, and students at the side of the bus. These mirrors present a view of people and objects that does not accurately reflect their size and distance from the bus.

You should position these mirrors to see:

- The entire side of the bus up to the mirror mounts.
- Front of the rear tires touching the ground.
- At least one traffic lane on either side of the bus.

- Figure 10.3 shows how both the outside left and right side convex mirrors should be adjusted.

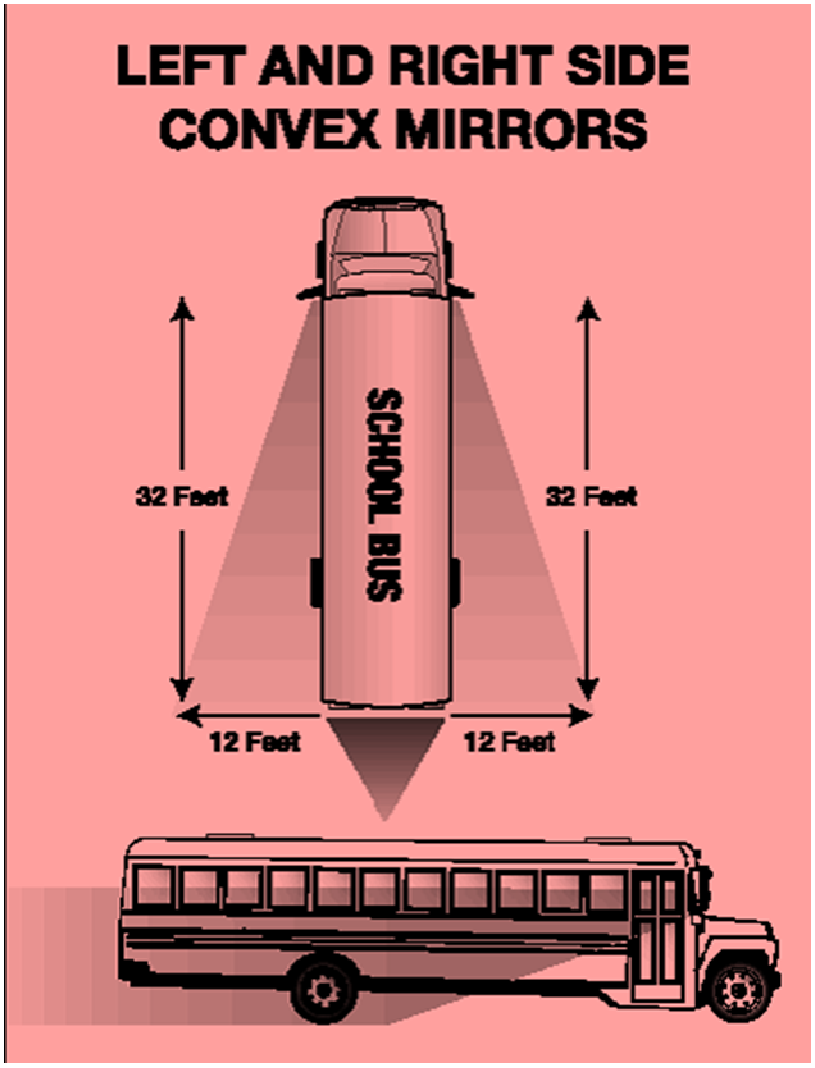


Figure 10.3

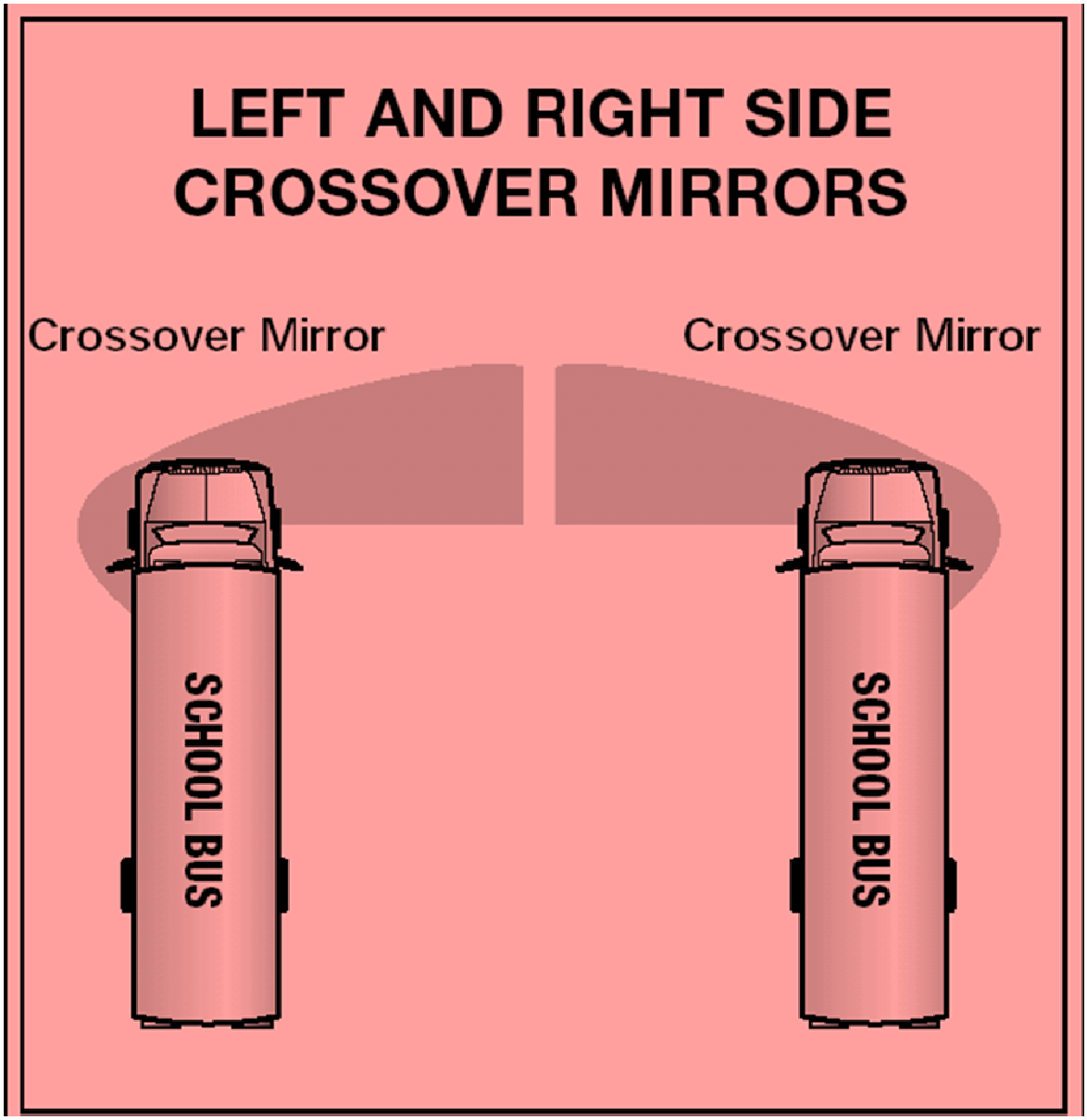
Outside Left and Right Side Crossover Mirrors

These mirrors are mounted on both left and right front corners of the bus. They are used to see the front bumper “danger zone” area directly in front of the bus that is not visible by direct vision, and to view the “danger zone” area to the left side and right side of the bus, including the service door and front wheel area. The mirror presents a view of people and objects that does not accurately reflect their size and distance from the bus. The driver must ensure that these mirrors are properly adjusted.

Ensure that the mirrors are properly adjusted so you can see:

- The entire area in front of the bus from the front bumper at ground level to a point where direct vision is possible. Direct vision and mirror view vision should overlap.

- The right and left front tires touching the ground.
- The area from the front of the bus to the service door.
- These mirrors, along with the convex and flat mirrors, should be viewed in a logical sequence to ensure that a child or object is not in any of the danger zones.
- Figure 10.4 illustrates how the left and right side crossover mirrors should be adjusted.



Overhead inside Rearview Mirror

This mirror is mounted directly above the windshield on the driver's side area of the bus. This mirror is used to monitor passenger activity inside the bus. It may provide limited visibility directly in back of the bus if the bus is equipped with a glass-bottomed rear

emergency door. There is a blind spot area directly behind the driver's seat as well as a large blind spot area that begins at the rear bumper and could extend up to 400 feet or more behind the bus. You must use the exterior side mirrors to monitor traffic that approaches and enters this area.

You should position the mirror to see:

- The top of the rear window in the top of the mirror.
- All of the students, including the heads of the students right behind you.

Loading and Unloading

More students are killed while getting on or off a school bus each year than are killed as passengers inside of a school bus. As a result, knowing what to do before, during, and after loading or unloading students is critical.

This section will give you specific procedures to help you avoid unsafe conditions which could result in injuries and fatalities during and after loading and unloading students.

> Rationale: Some stops require different procedures, related to the use of loading lights. Depending on whether you are loading on the highway or off the highway. If you are loading off of the highway the loading light system should not be activated.
>
> However all necessary precautions should be taken to ensure the safety of the students.

On highway loading procedure

Each school district establishes official routes and official school bus stops. All stops should be approved by the school district prior to making the stop. You should never change the location of a bus stop without written approval from the County Transportation director.

You must use extreme caution when approaching a school bus stop. You are in a very demanding situation when entering these areas.

It is critical that you understand and follow all state and local laws and regulations regarding approaching a school bus stop.
This would involve the proper use of mirrors, alternating flashing lights, stop arm, and crossing control arm.

When approaching the stop, you should:

- Approach cautiously at a slow rate of speed.
- Make a light brake application to activate brake lights so that vehicles behind you will have an indication that the bus is about to stop.
- Activate: alternating flashing amber warning lights at least 200 feet or approximately 5-10 seconds before the school bus stop.
- Look for pedestrians, traffic, or other objects before, during, and after coming to a stop.
- Continuously check all mirrors.
- Continuously check mirrors to monitor the danger zones for students, traffic, and other objects. Move as far as possible to the right on the traveled portion of the roadway.
- Bring school bus to a full stop with the front bumper at least 10 feet away from students at the designated stop. This forces the students to walk to the bus so you have a better view of their movements.
- Place transmission in Park, or if there is no Park shift point, in Neutral and set the parking brake at each stop.
- Open service door, if possible, enough to activate alternating red lights when traffic is a safe distance from the school bus.
- Make a final check to see that all traffic has stopped before completely opening the door and signaling students to approach.

Loading Procedures

- Students should wait in a designated location for the school bus, facing the bus as it approaches.
- Students should board the bus only when signaled by the driver.
- Monitor all mirrors continuously.
- Count the number of students at the bus stop and be sure all board the bus. If possible, know names of students at each stop. If there is a student missing, ask the other students where the student is.
- Have the students board the school bus slowly, in single file, and use the handrail. The dome light should be on while loading in the dark.
- Wait until students are seated and facing forward before moving the bus. There must be sufficient space on the school bus seat for each passengers body to be completely contained within the seat compartment in the event of a crash or sudden driving maneuver, students who are not completely seated within the seat compartment may not benefit from the passenger crash protection system built into the school bus under federal and state regulations.
- Check all mirrors. Make certain no one is running to catch the bus.
- If you cannot account for a student outside, secure the bus, take the key, and check around and underneath the bus.
- When all students are accounted for, prepare to leave by:
  a. Closing the door.
  b. Engaging the transmission.
  c. Releasing the parking brake.

d. Turning off alternating flashing red lights.
e. Checking all mirrors again.
f. Allowing congested traffic to disperse.
g. When you have determined it is safe, proceed and continue the route.

Off highway Loading

If an off Highway stop has been established and at any time the circumstances change requiring a student to cross the Highway. The County Transportation Director must be notified prior to changing the stop. Then an approved and proper procedure can be made.

You must use extreme caution when approaching a school bus stop. You are in a very demanding situation when entering these areas. It is critical that you understand and follow all state and local laws and regulations regarding approaching a school bus stop.

This would involve the proper use of mirrors.

When approaching the stop, you should:

- Approach cautiously at a slow rate of speed.
- Look for pedestrians, traffic, or other objects before, during, and after coming to a stop.
- Turn on right turn signal indicator about 100-300 feet or approximately 3-5 seconds before pulling over.
- Continuously check mirrors to monitor the danger zones for students, traffic, and other objects.
- Move a safe distances from the travel portion of the roadway.
- Bring school bus to a full stop with the front bumper at least 10 feet away from students at the designated stop. This forces the students to walk to the bus so you have a better view of their movements.
- Place transmission in Park, or if there is no Park shift point, in Neutral and set the parking brake at each stop.
- Make a final check and when you have determined that it is safe, open the door and signal for students to load.

Loading procedure at School

- The loading procedure is essentially the same, wherever you load students, but there are slight differences. When students are loading at the school campus, you should:
- Turn off the ignition switch. *Lift equipped buses may require a different procedure*
- Remove key if leaving driver's compartment.
- Position yourself to supervise loading as required or recommended by your state or local regulations.

Unloading Procedures on Highway

To be used when there is no student crossing the highway

- Perform a safe stop at designated unloading areas as described.
- Open service door, if possible, enough to activate alternating red lights when traffic is a safe distance from the school bus.
- Make a final check to see that all traffic has stopped before completely opening the door
- Have the students remain seated until told to exit.
- Check all mirrors.
- Tell students to exit the bus and walk at least 10 feet away from the side of the bus to a position where the driver can plainly see all students
- Count the number of students while unloading to confirm the location of all students before pulling away from the stop.
- Check all mirrors again. Make sure no students are around or returning to the bus.
- If you cannot account for a student outside the bus, secure the bus, and check around and underneath the bus.
- When all students are accounted for, prepare to leave by:
  a. Closing the door.
  b. Engaging transmission.
  c. Releasing parking brake.
  d. Turning off alternating flashing red lights.
  e. Checking all mirrors again.
  f. Allowing congested traffic to disperse.
  g. When it is safe, move the bus, and continue the route.

While performing unloading and crossing procedures, school bus drivers should remember that they are not traffic officers. Signals given to other motorists from inside the bus could be easily misunderstood. If a driver of a motor vehicle violates the red light law (wv code 17C-12-9) or acts in any way to jeopardize the safety of bus passengers, the operator should obtain the offenders license plate number and report the office to a magistrate office.

Note. If you have missed a student's unloading stop, do not back up. Be sure to follow local procedures.

However, if backing is required at or near a school bus stop, the backing procedure should be completed prior to passenger discharge. If and adult or responsible person is available, use his/her assistance while backing.

Additional Procedures for Students That Must Cross the Roadway.

You should understand what students should do when exiting a school bus and crossing the street in front of the bus. In addition, the school bus driver should understand that students might not always do what they are supposed to do.

If a student or students must cross the roadway, they should follow these procedures:

- Walk approximately 10 feet away from the side of the school bus to a position where you can see them.
- Walk to a location at least 10 feet in front of the right corner of the bumper, but still remaining away from the front of the school bus.
- Stop at the right edge of the roadway. You should be able to see the student's feet.
- When students reach the edge of the roadway, they should:
  a. Stop and look in all directions, making sure the roadway is clear and is safe.
  b. Check to see if the red flashing lights on the bus are still flashing.
  c. Wait for your signal before crossing the roadway.
  d. Upon your signal, the students should:
     (1) Cross far enough in front of the school bus to be in your view.
     (2) Stop at the left edge of the school bus.
     (3) Look again for your signal to continue to cross the roadway
     (4) Look for traffic in both directions, making sure roadway is clear.
     (5) Proceed across the roadway, continuing to look in all directions.

Unloading off highway

If an off Highway stop has been established and at any time the circumstances change requiring a student to cross the Highway. The County Transportation Director must be notified prior to changing the stop. Then an approved and proper procedure can be made.

Approaching the Stop

You should never change the location of a bus stop without written approval from the County Transportation Director.

You must use extreme caution when approaching a school bus stop. You are in a very demanding situation when entering these areas. It is critical that you understand and follow all state and local laws and regulations regarding approaching a school bus stop. This would involve the proper use of mirrors.

When approaching the stop, you should:

- Approach cautiously at a slow rate of speed.
- Look for pedestrians, traffic, or other objects before, during, and after coming to a stop.
- Continuously check all mirrors.
- Turn on right turn signal indicator about 100-300 feet or approximately 3-5 seconds before pulling over.
- Continuously check mirrors to monitor the danger zones for students, traffic, and other objects.
- Move a safe distances from the travel portion of the roadway.
- Bring school bus to a full stop.
- Place transmission in Park, or if there is no Park shift point, in Neutral and set the parking brake at each stop.
- Have the students remain seated until told to exit.

- Check all mirrors.
- Make a final check and when you have determined that it is safe, open the door and signal for students to unload.
- Tell students to exit the bus and walk at least 10 feet away from the side of the bus to a position where the driver can plainly see all students.
- Check all mirrors again. Make sure no students are around or returning to the bus.
- Count the number of students while unloading to confirm the location of all students before When all students are accounted for, prepare to leave by:
  a. Closing the door.
  b. Engaging transmission.
  c. Releasing parking brake.
  d. Turning on left turn signal.
  e. Checking all mirrors again.
  f. Allowing congested traffic to disperse.
- When it is safe, move the bus, enter the traffic flow and continue the route.

Note. If you have missed a student's unloading stop, do not back up. Be sure to follow local Procedures.

Unloading Procedures at School

State and local laws and regulations regarding unloading students at schools, particularly in situations where such activities take place in the school parking lot or other location that is off the traveled roadway, are often different than unloading along the school bus route.

It is important that the school bus driver understands and obeys state and local laws and regulations. The following procedures are general guidelines.

When unloading at the school you should follow these procedures:

- Perform a safe stop at designated unloading areas and secure the bus.
- Have the students remain seated until told to exit.
- Position yourself to supervise unloading as required or recommended by your state or local regulations.
- Have students exit in orderly fashion.
- Observe students as they step from bus to see that all move promptly away from the unloading area.
- Walk through the bus and check for hiding/sleeping students and items left by students.
- Check all mirrors. Make certain no students are returning to the bus.
- If you cannot account for a student outside the bus and the bus is secure, check around and underneath the bus.

When all students are accounted for, prepare to leave by:

- Closing the door.
- Fastening safety belt.

- Engaging the transmission.
- Releasing the parking brake.
- Checking all Mirrors.

Special Dangers of Loading and Unloading **Dropped or Forgotten Objects.**
Always focus on students as they approach the bus and watch for any who disappear from sight.

Students may drop an object near the bus during loading and unloading. Stopping to pick up the object or returning to pick up the object may cause the student to disappear from the driver's sight at a very dangerous moment.

Students should be told to leave any dropped object and move to a point of safety out of the danger zones and attempt to get the driver's attention to retrieve the object.

Handrail Hang-ups
Students have been injured or killed when clothing, accessories, or even parts of their body get caught in the handrail or door as they exited the bus.

You should closely observe all students exiting the bus to confirm that they are in a safe location. Prior to moving the bus continues to monitor all mirrors.

Any problems or special situations should be reported immediately to your supervisor or school authorities.

This concludes the On the Road Driver Training Manual.