

UNIT I

DRIVING SKILLS

GOAL: TO ACQUAINT SCHOOL BUS DRIVERS WITH FUNDAMENTAL MANIPULATIVE SKILLS AND DEFENSIVE DRIVING TECHNIQUES.

Reference Code	Concept	Objectives	Major Instructional Points
1.1	Starting	The driver will be able to list and explain the starting procedures for all types of engines and transmissions.	Diesel Gasoline Propane
1.2	Shifting a manual transmission	The driver will be able to demonstrate the correct techniques for up and down shifting manual transmissions.	<u>Principles:</u> Positions Gear Selection Starting in motion Upshifting Downshifting
1.3	Shifting an Automatic Transmission	The driver will be able to list and explain the proper method for shifting automatic transmission.	<u>Principles:</u> Positions Gear Selection Starting in Motion
1.4	Steering & Turning	The driver will be able to explain the proper steering and turning techniques.	<u>Position:</u> Push – pull and hand over hand Right & left turns
1.5	Backing & Turnarounds	The driver will be able to explain the correct conditions and procedures for backing turnarounds.	Conditions Procedures CAUTION
1.6	Stopping & Parking	The driver will be able to explain the correct methods of stopping and parking.	Stopping Parking
1.7	Right-of-way	The driver will know when to proceed and when not to proceed.	Intersections Pedestrians Emergency Vehicles
1.8	Passing	The driver will know how to pass safely.	When to pass
1.9	Defensive Driving	The driver will be able to define defensive driving and give examples.	Definition Five keys of Smith System

UNIT I

DRIVING SKILLS

DRIVING FUNDAMENTALS:

School Bus Drivers have entrusted to them the lives and safety of human resources whose value cannot be measured. The driver must learn the basic skills and procedures. Once learned, these skills and procedures should be practiced to develop proficiency. By developing proficiency in skills and operating procedures, the driver can devote more attention to the ever-changing traffic situations. This should enable the driver to operate the bus with the highest degree of efficiency and safety.

Note: Before starting the engine, refer to UNIT IV - VEHICLE MAINTENANCE 4.2 STATIONARY INSPECTION

1.1 STARTING THE ENGINE

The starting procedure should become a routine matter, however, different engines (diesel, gasoline, propane) require different procedures. Be sure you have identified the engine type before attempting to start it. Depress the brake before starting the engine to check the electric assist.

POSSIBLE VIDEOS and RESOURCES:	1. Fundamentals of Bus Driving	MN DDS Buckley Prod.
	2. BTW Training	
	3. Martinez slides	Video Comm. Safety Videos Safety Videos JJ Keller
	4. Component Parts of the Undercarriage of a School Bus	
	5. Dual Air Brake Training Video	
	6. Undercarriage and Component Parts	
	7. Vehicle Inspections	

PROCEDURE:

- A. Diesel:
- o Check parking brake. It should be set to keep the bus from moving.
 - o Depress clutch if vehicle is equipped with a manual transmission.
 - o Shift to neutral/park position.
 - o Turn ignition on – wait for glow plugs to go out, if so equipped.
 - o Engage starter, depress accelerator as engine starts, according to manufacturer recommendations.
 - o Let engine idle for a short period, medium fast idle, throttle set at (1000 to 1200 rpm) for winter charging and warm ups, lights and heaters off. Monitor engine idle for 3 to 5 minutes for possible engine runaway. Wait for air pressure to build to appropriate levels (90 to 120 psi).

DO NOT RACE ENGINE

- B. Gasoline:
- o Check parking brake. It should be set to keep the bus from moving.
 - o Depress clutch if vehicle is equipped with a manual transmission.
 - o Shift to neutral/park position.
 - o Set choke. Push accelerator all the way down and then release it to set an automatic choke. If the bus has a manual choke, use only as much as necessary to start the engine.
 - o If engine is fuel-injected, do not touch the accelerator.
 - o Turn on the ignition switch, engage the starter.
 - o Let engine idle for a short period, medium fast idle, throttle set at (1000 to 1200 rpm) for winter

charging and warm ups, lights and heaters off. Monitor engine idle for 3 to 5 minutes for possible engine runaway. Wait for air pressure to build to appropriate levels (90 to 120 psi).

DO NOT RACE ENGINE

C. Propane:

- o Check parking brake. It should be set to keep the bus from moving.
- o Depress the clutch if vehicle is so equipped with a manual transmission.
- o Shift to neutral/park position.
- o Turn on ignition switch.
- o Use primer and a slightly depressed accelerator if the engine is cold. Nothing if the engine is warm.
- o Engage starter.
- o Let engine idle for a short period – 3 to 5 minutes. Wait for air pressure to build to appropriate levels (90 to 120 psi).

DO NOT RACE ENGINE

1.2 SHIFTING - MANUAL TRANSMISSIONS

PRINCIPLES OF SHIFTING:

Know the gear positions for your bus. Most buses have four or five forward speeds. Many buses have a gear position diagram on either the dash or gearshift knob. If you do not see a diagram, ask someone to show you the gear positions.

With some exceptions, second gear of manual transmissions is used for starting into motion under average terrain and load conditions. Ask your supervisor about your particular bus. Other conditions may dictate the use of low gear.

CAUTION: Never start out in a gear higher than second as this places undue strain on the engine and clutch.

STARTING IN MOTION:

Depress clutch and shift into starting gear. Hold service (foot) brake firmly while releasing the parking brake. Release clutch gradually to the friction point and hold. Release service brake and depress accelerator. Release clutch smoothly while depressing accelerator. Remove foot completely from clutch. Continue to depress accelerator as bus gains speed.

1.3 SHIFTING - AUTOMATIC TRANSMISSIONS

Up shifting – as speed increases, the transmission will shift automatically until the bus reaches cruising speed.

Downshifting – downshifting techniques vary a little from one brand of automatic transmission to another. It is best to check the manufacturer's recommendations for your particular vehicle.

A. Slowing for student stops:

- o release accelerator and gradually apply brakes.
- o increase brake pedal pressure slightly just before coming to a stop.
- o shift into neutral once stopped.
- o set parking brake when conditions warrant (steep hill, high volume of students at the stop).

B. Parking bus:

- o shift into neutral.

- o turn wheels properly (left when facing uphill where there is a curb and right at all other times).
- o set parking brake.
- o turn off ignition and remove key.

1.4 STEERING AND TURNING

The School Bus Driver must be able to assume the correct steering position and make all turns correctly and smoothly. The driver must learn the procedures necessary to prepare for the turn, make the turn and re-enter the traffic pattern. The driver confronted with an unusual turn or a turnaround should do so with extreme caution. In case of a possible crash, the driver should remember that evasive turning action may be safer than trying to stop.

A. Steering Position:

- o Hold the steering wheel firmly with both hands. If you hit a curb or pothole the wheel could pull away from your hands unless you have a good grip.
- o Assume a 10 – 2 or 9 – 3 position.
- o Hands should be on the rim of the steering wheel, not on the cross bar.

B. Push pull or hand over hand steering:

- o Which ever feels comfortable and is safe.
- o No palming.

C. Right Turns:

- o Signal your intention to make a turn.
- o Check traffic in all directions.
- o Move your head and body to eliminate blind spots created by the body, mirrors and/or moldings of the bus.
- o Reduce speed (manual transmission, down shift to proper gear to turn).
- o Position bus in proper lane (2 to 3 feet from curb).
- o Check traffic again in all directions.
- o Execute turn.
- o Turn wheel smoothly.
- o Check left mirror for tail swing.
- o Check right mirror while turning.
- o Enter the right most lane available and check turn signals for cancellation.
- o Steer wheels back into position. Do not let steering wheel spin back.

See diagram:

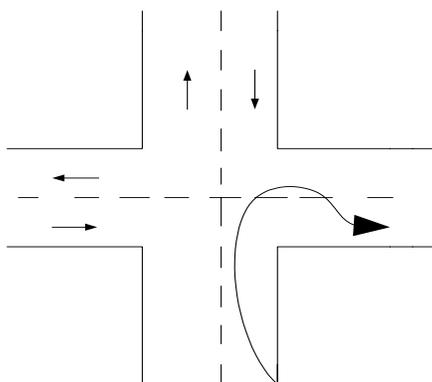


Figure 2-11
Do This

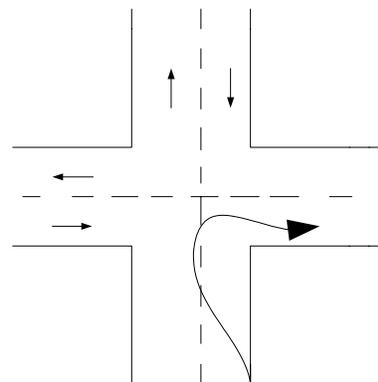
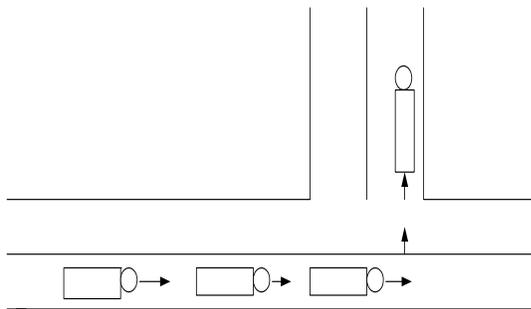


Figure 2-12
Don't Do This

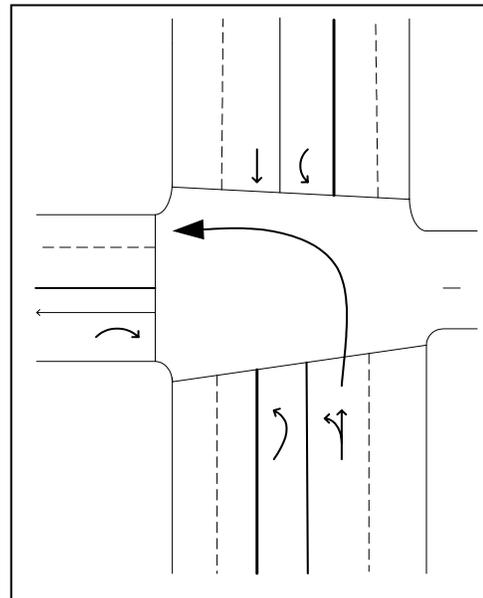
D. Left Turns:

- o Check traffic in all directions.
- o Move your head and body to eliminate blind spots created by the bus body, mirrors and/or moldings of the bus.
- o Give proper left turn signal.
- o Reduce speed (manual transmission, downshift to proper gear for turn).
- o Position bus in proper lane (move into the left most lane or to the right of center of the street unless there is more than one turn lane).
- o Keep front wheels straight if waiting to turn.
- o Do not enter intersection until safe to do so and only when you can complete your turn safely.
- o Check traffic again in all directions.
- o Execute turn.
- o Turn wheel smoothly.
- o Check right mirror for tail swing.
- o Check left mirror while turning.
- o Turn into appropriate lane. Outside lane to most outside available lane.
- o Check signal for cancellation.
- o If on a multi-lane street or highway, increase speed and move into proper lane as soon as possible.

See diagram provided:



Left Turn



Example: If there are two left-hand lanes, Use the right-hand lane.

1.5 TURN AROUND AND BACKING – Mn Rule 7470.1000 Subp. 3

A turn around is a procedure used to turn the bus around, by backing, so as to proceed in the opposite direction. If backing is necessary in a loading zone or near pedestrians, the driver should get assistance from a responsible adult. This adult would be able to see the area behind the bus and must be able to communicate with the driver.

PASSENGERS SHOULD ALWAYS BE ON THE BUS WHILE YOU ARE BACKING

A. Backing and turn around conditions:

- o NEVER BACK UP IF THERE IS A SUITABLE ALTERNATIVE.
- o Whenever possible you should avoid this hazardous maneuver.

- Backing and turn around are necessary on some routes.
- B. Backing and turn around procedures - MAKE ABSOLUTELY SURE THAT:
- It is necessary to back.
 - You activate the 4 way warning lights and honk the horn.
 - You have an unrestricted view. If you are not sure what is behind you, get out and look.
 - You have sufficient space – remember the overhang of the bus.
 - Your passengers have boarded before you back and conversely, you back before they disembark.
 - It is quiet on board. You want to be able to hear sounds or the warning of passengers or bystanders.
 - You have visibility for at least 500 feet.

1.6 STOPPING and PARKING

MANUAL TRANSMISSIONS:

- A. Stop in low gear at speeds below 10 mph:
- Release accelerator and gradually apply brakes.
 - Depress the clutch and reduce brake pressure slightly just before coming to a stop.
 - Shift into neutral, release clutch and remove foot from pedal.
- B. Stopping from cruising gear:
- Release accelerator and apply brakes.
 - As proper speed is reached, downshift to lower gear.
 - As bus reaches lower speeds, follow procedure outlined in “A” above.
- C. Parking bus:
- Shift into proper gear.
 - Low gear on level or upgrade.
 - Reverse on downgrade.
 - Turn wheels properly.
 - Left when facing uphill where there is a curb.
 - Right at all other times.
 - Set parking brake.
 - Turn off ignition and remove key.

AUTOMATIC TRANSMISSIONS:

- A. Stop when in drive at speeds below 10 mph:
- Release accelerator and gradually apply brakes.
 - Increase brake pedal pressure slightly just before coming to a stop.
 - Shift into neutral.
 - Set parking brake.
- B. Stopping from cruising gear:
- Release accelerator and apply brakes.
 - As bus reaches lower speeds follow procedures outlined in “A” above.
- C. Parking bus:
- Shift into neutral.
 - Turn wheels properly.
 - Left when facing uphill where there is no curb.
 - Right at all other times.
 - Set parking brake.

- o Turn off ignition and remove key.

1.7 RIGHT OF WAY

RIGHT OF WAY IS SOMETHING YOU GIVE, NOT SOMETHING YOU TAKE

RIGHT OF WAY PROCEDURES:

- o Drivers turning left, give the right of way to oncoming vehicles.
- o Driver must allow 3 feet for bicyclist.
- o At uncontrolled intersections, drivers approaching from the left must give the right of way to drivers coming from the right.
- o Drivers must give the right of way to pedestrians when:
 - a) The pedestrian is in a marked or unmarked crosswalk.
 - b) To a pedestrian crossing the road when a vehicle is turning.
 - c) To a pedestrian on the sidewalk at a driveway or alley way.
 - d) Driver must remain stopped until the pedestrian has passed the lane in which the vehicle is stopped.
- o Drivers will yield to emergency vehicles at all times.
- o Emergency vehicles are proceeding cautiously with due regard for the safety of persons using the streets. Drivers should be aware of the emergency vehicle. They will yield to the 8-light system and children in the roadway. Bus drivers should make every effort to clear the roadway when safe.
- o Pull as far off the road as possible when encountering an emergency vehicle.
- o When passing a stopped emergency vehicle on a roadway, make every effort to safely move over one lane away from that vehicle

When in doubt, YIELD !

POSSIBLE VIDEOS And BROCHURES:	1. You and Your Bus, the Perfect Fit	Vol. 10 Mn. DDS
	2. Reference Point Driving	Vol. 10 Mn. DDS
	3. In Less than a Second	Vol. 11 Mn. DDS
	4. Common Sense	Vol. 11 Mn. DDS
	5. Driving Techniques	JJ Keller
	6. Using Your Mirrors	JJ Keller
	7. Emergency Maneuvers	JJ Keller
	8. City Driving	JJ Keller
	9. Mirror Usage and Blind Spots	Safety Videos
	10. How to Survive Tire Blowout on School Bus	Safety Videos
	11. Pre-trip for Your School Bus	Coastal
	12. School Bus Brake Systems: Air Brakes	Coastal
	13. School Bus Brake Systems: Braking Techniques	Coastal
	14. School Bus Brake Systems: Intermittent Pressure	Coastal

15. School Bus Brake Systems: Steady Pressure	Coastal
16. School Bus Mirror Systems	Coastal

1.8 PASSING

If passing is absolutely necessary, think of the safety of the students on the bus first.

It will take 10 to 20 seconds to complete the pass. If you need to exceed the speed limit in order to pass, you should not be passing.

PASSING PROCEDURE: - When passing:

- o Check for signs and road markings.
- o Check traffic ahead, including driveways.
- o When following large vehicles, drivers must be able to see that vehicles rear view mirror. Stay out of their blind spots.
- o Check traffic behind, to the left and glance over your shoulder.
- o Signal your change to the left.
- o Double check signs, markings, and traffic.
- o Move to the left and proceed to pass.
- o Pull back to the right only when there is sufficient space between the bus and the vehicle you are passing (you should be able to see the other vehicle entirely in your rear view mirror) and you have signaled your lane change.

REMEMBER YOUR SPEED LIMITS AT ALL TIMES!

POSSIBLE RESOURCES:	Brochure - No Zone Flyer Department of Public Safety
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1.9 DEFENSIVE DRIVING

A defensive driver is a driver that drives in a manner as to never be in a crash or part of a crash. A defensive driver is one who makes allowances for the lack of skill and lack of knowledge on the part of the other driver. Defensive drivers recognize that they have no control over the unpredictable actions of other drivers and pedestrians, nor over conditions of weather and road. Defensive drivers develop a defense against all these hazards. They concede their right of way and make other concessions to avoid a collision. They are careful to avoid the crash traps caused by weather, roads, pedestrians and other drivers.

Neither icy roads, curves, narrow roads, the absence of signs, or signals out of order, nor carelessness, recklessness or ignorance on the part of others relieves drivers, in the slightest degree, of their responsibility for driving without a crash. These are situations likely to be encountered at any time and we must drive accordingly.

RECOMMENDED	1. School Bus Driving	Techniques	Vol. 2 Mn. DDS
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VIDEOS:	2. Are You Reading Me?	Vol. 5 Mn. DDS
	3. Children in Traffic	Vol. 5 Mn. DDS
	4. Sharing the Roads with Big Trucks	Vol. 6 Mn. DDS
	5. Freeway Driving	Vol. 6 Mn. DDS
	6. Looking Good	Vol. 7 Mn. DDS
	7. To Drive at Night	Vol. 7 Mn. DDS
	8. Coaching the School Bus Driver	Mn. Safety Council
	9. Night Driving for School Bus Drivers	Safety Videos
	10. Winter Bus Driving Safety	Safety Videos
	11. Mountain Driving for School Drivers	Safety Videos
	12. Safety Orientation for Bus Drivers	Safety Videos
	13. Railroad Crossings	Safety Videos
	14. Operation Lifesaver Videos	Safety Videos
	15. Defensive Driving for School Bus Drivers	Coastal
	16. School Bus Held Hostage	Coastal
	17. Winter Driving	Coastal
	18. Winter Driving Safety for School Bus Drivers	Coastal
	19. Safe Winter Driving	Coastal
	20. Defensive Driving: A Crash Course	Coastal
	21. Defensive Driving: Preparing for the Worst	Coastal
	22. Defensive Driving: 15-Passenger Vans	Coastal
	23. Driven to Distraction	Coastal
	24. Hazard Perception Challenge Driver Training Kit	JJ Keller
	25. Hazard Perception Challenge Driver II Training Kit	JJ Keller
	26. Seeing Hazards	JJ Keller
	27. Defensive Driving	JJ Keller
	28. Accident Procedures	JJ Keller
	29. Safe School Bus Crossing Procedures	Video Communication
	Winter Driving Safety for School Bus Drivers	Video Communication

THE SMITH SYSTEM OF DEFENSIVE DRIVING:

The Smith System of Defensive Driving is a series of driving techniques that allow you to obtain maximum space for your vehicle and maximum visibility to you, the driver.

Five keys to space cushion driving:

1. Aim high is steering.
2. Get the big picture.
3. Keep your eyes moving.
4. Leave yourself an out.
5. Make sure they see you.

Points to safe driving:

The following checklist contains 35 points that should be explained and then demonstrated by an instructor. These are the major points that the Smith System stresses.

1. Describe best hand position due to airbag (if applicable).
2. Checking over the shoulder before entering traffic.
3. Demonstrate the fifteen second eye lead time.
4. Reasons for scanning intersections before entering.
5. From a stopped position, allowing the vehicle in front to move out for 4 seconds before accelerating.
6. Scanning the steering wheels parked cars (dirty wheels vs clean wheels).

7. Reasons for braking early.
8. Demonstrate the 4 second (or greater) following distance.
9. One car length between vehicles at a stopped position.
10. How to avoid holding up traffic when pacing lights.
11. Point out poor driving habits of other drivers.
12. Identify packs or clusters of traffic.
13. Demonstrate obtaining eye contact.
14. Demonstrate and define the point of no return.
15. Identify space around the vehicle.
16. Demonstrate and define the lane of least resistance.
17. Fresh and stale lights.
18. Point out and define tire to ground contact.
19. Apply the brake and check your mirror.
20. Explain that the light is not green until the brake lights go out and the vehicle ahead starts to roll.
21. Mirrors should be checked every 5 to 8 seconds.
22. Convenience vs. emergency lane changes.
23. Patterns established by other drivers.
24. When appropriate, use Key #1 by name.
25. When appropriate, use Key #2 by name.
26. When appropriate, use Key #3 by name.
27. When appropriate, use Key #4 by name.
28. When appropriate, use Key #5 by name.
29. Leaving one car length behind crosswalk when stopped.
30. Contrast your space, visibility and options with another driver lacking these.
31. Point out aggressive drivers who are not getting ahead.
32. Demonstrate and explain proper turn signal timing.
33. Demonstrate and explain the four-second lane change.
34. Comment on the benefits of seeking alternatives to backing.
35. Comment on parking choice.

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SUMMARY:

The School Bus Driver should be well versed and skilled in driving fundamentals. However, this alone is not enough. School Bus Drivers must also be defensive drivers and operate their bus in such a manner that, regardless of the type of situation that develops, they will be able to protect their passengers and vehicle from harm. This skill, once acquired, should be maintained and improved with daily practice of defensive driving skills and timely “on street evaluations.”

TRAINING OPPORTUNITIES:	Train the Trainer (Offered in July by MAPT & MSBOA) Contact Ray Kroll (612) 391-6656 (videos) Department of Public Safety Department of Transportation
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