1980
Revised Edition

STANDARDS for SCHOOL BUSES and OPERATIONS

National Minimum Standards
for School Buses
National Minimum Standard
Guidelines for
School Bus Operations

NATIONAL MINIMUM STANDARDS FOR SCHOOL BUSES AND NATIONAL MINIMUM STANDARD GUIDELINES FOR SCHOOL BUS OPERATIONS

1980 Revised Edition

Recommendations of

THE NINTH NATIONAL CONFERENCE ON SCHOOL TRANSPORTATION

Central Missouri State University
Warrensburg, Missouri
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NATIONAL MINIMUM STANDARD GUIDELINES FOR SCHOOL BUS OPERATIONS

SPECIAL EDUCATION OPERATION

GENERAL FOREWORD

The 1980 National Conference on School Transportation was the latest in a series beginning in 1939 and continuing in 1945, 1948, 1951, 1954, 1959, 1965, and 1970. All conferences have been made up of official representatives of State Departments of Education, local school district personnel, contract operators, advisors from industry and from other interested professional organizations and groups. Each conference has resulted in one or more publications that contain the recommendations of that particular conference.

The recommendation of standards for school buses and their operation has been a major purpose of all conferences. The 1939 Conference was called for this sole purpose, and formulated a set of recommended standards for school buses of 20 or more passengers. The 1945 Conference revised them and added standards for small vehicles of 10 to 18 passengers. Both standards were further revised by the 1948 Conference. In 1951 an interim conference formulated tentative standards for transit and metropolitan types of school buses, and these were incorporated in the revised standards that came out of the 1954 Conference. There were further revisions in 1959, and the 1964 Conference added standards for school buses to be used in transporting handicapped children. In addition to revising standards for larger vehicles, the 1970 Conference refined the standards for school buses designed to transport fewer than 24 passengers.

The 1980 Conference updated the standards for school bus chassis and bodies, rewrote the complete standards for the Special Education bus, and included definitions for the Type A, B, C, and D bus. One of the major tasks of the 1980 Conference was to revise the standards to remove any conflicts with superseding Federal Regulations, many of which were mandated by The Motor Vehicle and School Bus Safety Amendments of 1974 (P.L. 93–492) Sections.

Other major problems in pupil transportation have received attention at these National Conferences. On several occasions, recommendations concerned primarily with overtaking and passing of school buses were transmitted to the National Committee on Uniform Traffic Laws and Ordinances for consideration in connection with revisions of the Uniform Vehicle Code. The 1948 Conference made recommendations on uniform records and reports for pupil transportation. The major purpose of the 1948 Conference was the formulation of recommendations related to standards and training programs for school bus drivers. These recommendations were revised by the 1959 Conference, and a new publication on the topic was issued. The 1954 Conference gave considerable time to the discussion of the extended use of school buses in the school program. The 1970 Conference also adopted standards for school bus operation (issued in a separate report).

With the enactment in 1966 of the National Traffic and Motor Vehicle Safety Act, the federal government was given responsibility for developing and promulgating motor vehicle safety standards applicable to motor vehicles sold in the United States. Whenever such standards either differ

from, go beyond, or are in addition to the standards adopted by the 1980 National Conference, they automatically apply to school buses sold in all the states.

The structure for the 1980 Conference and its operating guidelines was carried out by the Interim Committee and representatives from Central Missouri State University with the cooperation of the School Transportation Section of the National Safety Council at the organization meeting of the Conference Steering Committee July 13–14, 1978. Funding for the conference was shared solely by each individual participant of the Interim Steering and Writing Committees, and all delegates at the conference.

Stanley A. Abercrombie
Conference Chairperson

OBJECTIVES AND GUIDING PRINCIPLES

Since the first National Conference on school bus standards in 1939, certain objectives and guiding principles have had a vital role in the development of the minimum standards for school buses. These objectives and guiding principles have been reaffirmed and emphasized at the subsequent National Conferences. The two major objectives, safety and economy, along with the following principles, have served as guide-posts for making decisions on the minimum standards and in arriving at sound and common agreement.

OBJECTIVES

The transportation of pupils in safety and comfort on safe, economical vehicles can be assured through adequate state regulations governing school bus construction.

Safety includes all those factors relating to the school bus construction which may directly or indirectly affect the safety and welfare of pupils transported.

Economy includes the construction, procurement, operation, and maintenance of school buses consistent with the safety and welfare of the pupils.

GUIDING PRINCIPLES

1. Uniform state school bus standards should:
   a. Be consistent with the objectives of safety and economy.
   b. Eliminate the construction of unsafe buses.
   c. Reduce conflicting standards wherever possible among states in the interest of production efficiency.

d. Specify exact dimensions where necessary to increase the efficiency of volume production.

e. Eliminate unnecessary luxury consistent with the safety and welfare of pupils transported.

2. Any adaptation of the nationally recommended minimum standards should be made by states only in order to permit desirable adjustments to local needs and only when such adaptations do not:

   a. Basically conflict with the recommended National Minimum Standards.

   b. Otherwise unduly increase production costs.

3. Uniform state standards for school buses should specify results desired in terms of safety and economy, and these performance specifications must be defined when this is necessary to make the regulations enforceable.

4. Provisions should be made for periodic review and revision of uniform state standards for school buses through cooperation of the states.

5. Uniform state standards for school buses should permit opportunities for the use of new inventions and improvements which are consistent with safety and economy.

6. Uniform state standards for school bus construction should provide for a degree of flexibility within which sound construction is possible (consistent with safety and economy) to accomodate the various manufacturers.

7. Uniform state standards for school bus construction should recognize that the actual designing of school buses is a responsibility of the manufacturers.

8. The current National Minimum Standards for School Buses are considered in full force and effect as recommendations to the states. Revisions of these standards are made only when evidence indicates that such revisions are needed.

USING THESE MINIMUM STANDARDS

In order that these minimum standards for school buses may be put into effect, each state legislature which has not already done so should confer upon the appropriate state agency the general responsibility for setting up statewide rules and regulations regarding the construction of school bus chassis, bodies and equipment. Detailed standards for school buses or their operations should not be written into state law.

The minimum standards for school buses appearing in this report must be officially adopted by the appropriate state agency to become legally effective within that state.

These minimum standards are intended to apply primarily to new vehicles, including all types of school buses as defined in the section entitled, Definitions, School Bus (Type A, Type B, Type C, Type D). It should be noted here that vehicles with a capacity for less than 10 passengers cannot be certified as school buses under federal regulations.

These minimum standards are not intended to apply to buses used primarily as public carriers rather than to transport pupils to and from school.

States should normally allow at least six (6) months lead time between publication of specifications and effective date. The effective date should be expressed:

"These specifications apply respectively to chassis and bodies placed in production after (month, date, year)."

INTRODUCTION TO SCHOOL BUS STANDARDS

This portion of the book is divided into two sections: Chassis Standards and Body Standards. There are two basic reasons for this format: (1) to define minimum chassis and body standards, and (2) to assign responsibility for providing the defined equipment. Items in the chassis standards are to be provided by the chassis manufacturer; items in the body standards are to be provided by the body manufacturers.

Every attempt has been made by the Writing Committees, the Conference itself, and the Editing Committees to eliminate conflicts between these specifications and federal regulations. Should conflicts be found or arise through new federal regulations or legally binding interpretations of those regulations they should be brought to the attention of the Interim Committee.

For new vehicles, it is the responsibility of the vehicle manufacturers to certify compliance with applicable federal standards by installing a certification plate in the driver's area on each vehicle. However, as the vehicle is maintained over its useful life, it is the responsibility of those who

supervise and perform work on the vehicle to assure on-going compliance with all applicable standards. For this reason, maintenance personnel training, quality components, quality workmanship and thorough maintenance records are absolutely essential.

As the title of this document suggests, these are intended to be minimum standards. However, it is in the interest of the entire school bus industry to maintain uniformity in certain basic areas such as vehicle identification. This concept was endorsed by the conference by deciding to tighten color tolerances on National School Bus Glossy Yellow and by deciding to standardize on an eight light warning system.

Finally, in order to insure that specifications are being met by manufacturers, states are urged to adopt and carry out effective pre-delivery inspection programs. This will promote safety as well as uniformity of compliance with specifications.

DEFINITIONS, SCHOOL BUS

TYPE A—

A Type "A" school bus is a conversion or body constructed upon a van-type compact truck or a front-section vehicle, with a gross weight rating of 10,000 pounds or less, designed for carrying more than 10 persons.

TYPE B—

A Type "B" school bus is a conversion or body constructed and installed upon a van or front-section vehicle chassis, or stripped chassis, with a vehicle weight rating of more than 10,000 pounds, designed for carrying more than 10 persons. Most of the engine is beneath and/or behind the windshield and beside the driver's seat. The entrance door is behind the front wheels.

TYPE C—

A Type "C" school bus is a body installed upon a flat back cowl chassis with a gross vehicle weight rating of more than 10,000 pounds, designed for carrying more than 10 persons. All of the engine is in front of the windshield and the entrance door is behind the front wheels.

TYPE D—

A Type "D" school bus is a body installed upon a chassis, with the engine mounted in the front, midship, or rear, with a gross vehicle weight rating of more than 10,000 pounds, designed for carrying more than 10 persons. The engine may be behind the windshield and beside the driver's seat; it may be at the rear of the bus, behind the rear wheels, or midship between the front and rear axles. The entrance door is ahead of the front wheels.

CHASSIS STANDARDS
THE BUS CHASSIS

AIR CLEANER

1. The engine intake air cleaner shall be furnished and properly installed by the chassis manufacturer to meet engine specifications.

AXLES

1. The front and rear ends including suspension assemblies shall have a gross axle weight rating at ground at least equal to that portion of the load as would be imposed by the chassis manufacturer's maximum gross vehicle weight rating.

BRAKES

1. A braking system, including service brake and parking brake, shall be provided.

2. Buses using air or vacuum in the operation of the brake system shall be equipped with warning signals, readily audible and visible to the driver, that will give a continuous warning when the air pressure available in the system for braking is 60 psi (pounds per square inch) or less or the vacuum in the system available for braking is eight inches (8) of mercury or less. An illuminated gauge that will indicate to the driver the air pressure in pounds per square inch or the inches of mercury vacuum available for the operation of the brakes shall be provided.

    a. Vacuum-assist brake systems shall have a reservoir used exclusively for brakes that shall be adequate to ensure loss in vacuum at full stroke application of not more than 30 per cent with the engine not running. Brake system on gas-powered engines shall include suitable and convenient connections for the installation of a separate vacuum reservoir.

    b. Any brake system dry reservoir shall be so safeguarded by a check valve or equivalent device, that in the event of failure or leakage in its connection to the source of compressed air or vacuum, the stored dry air or vacuum shall not be depleted by the leakage or failure.

3. Buses using a hydraulic assist-booster in the operation of the brake system shall be equipped with warning signals, readily audible and visible to the driver, that will provide continuous warning in the event of a loss of fluid flow from primary source.

4. The brake lines and booster-assist lines shall be protected from excessive heat and vibration and be so installed as to prevent chafing.

5. All brake systems shall be designed to permit visual inspection of brake lining wear without removal of any chassis components.

BUMPER, FRONT

1. Front bumper shall be furnished by chassis manufacturer as part of the chassis.

2. Front bumper shall extend beyond forward-most part of body, grille, hood, and fenders and shall extend to outer edges of fenders at bumper top line.

3. Front bumper, except breakaway bumper ends shall be of sufficient strength to permit pushing a vehicle of equal gross vehicle weight without permanent distortion to bumper, chassis, or body.

EXCEPTION: Type "D" Vehicle (Transit) front bumper shall be furnished by body manufacturer.

CERTIFICATION

1. Chassis manufacturer will, upon request, certify to the state agency having pupil transportation jurisdiction that their product meets minimum standards on items not covered by certification issued under requirements of the National Traffic and Motor Vehicle Safety Act.

CLUTCH

1. Clutch torque capacity shall be equal to or greater than the engine torque output.

COLOR

1. Chassis, including wheels and front bumper, shall be black; hood, cowl, and fenders shall be in National School Bus yellow. (See Appendix)

EXCEPTION: Hood may be painted low-luster yellow.

DRIVE SHAFT

1. Drive shaft shall be protected by a metal guard or guards around circumference of the drive shaft to reduce the possibility of it whipping through the floor or dropping to the ground if broken.

ELECTRICAL SYSTEM

1. Battery

   a. Storage battery shall have a minimum cold cranking capacity rating equal to the cranking current required for 30 seconds at 0° Farenheit (−17.8c) and a minimum reserve capacity rating of 120 minutes at 25 amp. Higher capacities may be required dependent upon optional equipment and local environmental conditions.

b. When a battery is to be mounted by the body manufacturer on a sliding tray as opposed to the standard installation provided by the chassis manufacturer, the battery shall be temporarily mounted on the chassis frame by the chassis manufacturer. In this case the final location of the battery and the appropriate cable lengths shall be according to the SBMI Design Objectives Booklet, 1980 edition (see Appendix).

2. Generator or Alternator

a. Type A bus shall have a minimum 60 ampere per hour alternator.

b. Type B bus shall have a minimum 80 ampere per hour alternator.

c. Type C and D buses shall have a generator or alternator with a minimum rating of at least 80 amperes (in accordance with Society of Automotive Engineers rating—see appendix) with minimum charging of 30 amperes at manufacturer's recommended engine idle speed (12 volt system), and shall be ventilated and voltage-controlled and, if necessary, current-controlled.

d. Type A, B, C, and D buses, equipped with an electrical power lift, shall have a minimum 100 ampere per hour alternator.

e. Direct-drive generator or alternator is permissible in lieu of belt drive. Belt drive shall be capable of handling the rated capacity of the generator or alternator with no detrimental effect on other driven components.

f. Refer to SBMI Design Objectives, May 1980 edition (see Appendix), for estimating required generator or alternator capacity.

3. Wiring

a. General—All wiring shall conform to current applicable recommended practices of the Society of Automotive Engineers (see appendix).

(1) All wiring shall use a standard color coding and each chassis shall be delivered with a wiring diagram that coincides with the wiring of the chassis.

b. Chassis manufacturer shall install a readily accessible terminal strip or plug on the body side of the cowl, or at accessible location in engine compartment of vehicles designed without a cowl, that shall contain the following terminals for the body connections:

(1) Main 100 amp body circuit.

(2) Tail lamps.

(3) Right turn signal.

(4) Left turn signal.

(5) Stop lamps.

(6) Back up lamps.

(7) Instrument panel lights (rheostat controlled by headlamp switch).

EXHAUST SYSTEM

1. Exhaust pipe, muffler, and tailpipe shall be outside bus body compartment and attached to chassis.

2. Tailpipe shall be constructed of a corrosion-resistant tubing material at least equal in strength and durability to 16 gauge steel tubing.

3. Tailpipe shall (a) extend beyond rear axle and shall extend at least 5 inches beyond chassis frame and be mounted outside of chassis frame rail at end point or (b) may extend to, but not beyond the body limits on the left side of the bus, behind the driver's compartment, outboard of chassis center line and shall terminate from chassis centerline as follows:

Type A vehicles	—Manufacturer's standard
Type B vehicles	—42.5 inches
Type C and D vehicles	—48.5 inches

EXCEPTION: The exhaust system on vehicles designed for the transportation of special education pupils shall be routed to the left of the right frame rail to allow for the installation of a lift on the right side of the vehicle.

4. Exhaust system on gas-powered chassis shall be properly insulated from fuel tank connections by a securely attached metal shield at any point where it is 12 inches or less from tank or tank connections.

5. Muffler shall be constructed of corrosion-resistant material.

FENDERS, FRONT, TYPE C VEHICLES

1. Total spread of outer edges of front fenders, measured at fender line, shall exceed total spread of front tires when front wheels are in straight-ahead position.

2. Front fenders shall be properly braced and free from any body attachments.

   EXCEPTION: Standard not applicable to Type A, B, and D vehicles.

FRAME

1. Frame or equivalent shall be of such design and strength characteristics as to correspond at least to standard practice for trucks of same general load characteristics which are used for highway service.

2. Any secondary manufacturer that modifies the original chassis frame shall guarantee the performance of workmanship and materials resulting from such modification.

3. Any frame modification shall not be for the purpose of extending the wheelbase.

4. Holes in top or bottom flanges of frame side rail shall not be permitted except as provided in original chassis frame. There shall be no welding to frame side rails except by chassis or body manufacturer.

5. Frame lengths shall be provided in accordance with SMBI Design Objectives, May 1980 edition. (See Appendix)

FUEL TANK

1. Fuel tank or tanks of minimum 30 gallon capacity with a 25 gallon actual draw shall be provided by the chassis manufacturer. It/they shall be filled and vented to the outside of the body, the location of which shall be so that accidental fuel spillage will not drip or drain on any part of the exhaust system.

2. No portion of the fuel system which is located to the rear of the engine compartment, except the filler tube, shall extend above the top of the chassis frame rail. Fuel lines shall be mounted to obtain maximum possible protection from the chassis frame.

3. Fuel filter with replaceable element shall be installed between fuel tank and engine.

4. Fuel tank installation shall be in accordance with SBMI Design Objectives, May 1980 edition. (See Appendix)

5. If a tank size other than 30 gallon is supplied, location of front of tank and filler spout must remain as specified by SBMI Design Objectives, May 1980 edition. (See Appendix)

   EXCEPTION: On vehicles constructed for transporting handicapped pupils, the fuel tank may be mounted on left chassis frame rail or behind rear wheels.

GOVERNOR

1. An engine governor is permissible. However, when it is desired to limit road speed, road-speed governor should be installed.

2. When engine is remotely located from driver, governor shall be installed to limit engine speed to maximum revolutions per minute recommended by engine manufacturer, or tachometer shall be installed so engine speed may be known to driver.

HEATING SYSTEM, PROVISION FOR

1. The chassis engine shall have plugged openings for the purpose of supplying hot water for the bus heating system. The opening shall be suitable for attaching ¾ inch pipe thread/hose connector. The engine shall be capable of supplying water having a temperature of at least 170°F at a flow rate of 50 pounds/per minute at the return end of 30 feet of one inch inside diameter automotive hot water heater hose. (SBMI Standard No. 001—Standard Code for Testing and Rating Automotive Bus Hot Water Heating and Ventilating Equipment.)

HORN

1. Bus shall be equipped with horn or horns of standard make, each horn capable of producing complex sound in bands of audio frequencies between 250 and 2,000 cycles per second and tested per Society of Automotive Engineers Standard J–377. (See Appendix)

INSTRUMENTS AND INSTRUMENT PANEL

1. Chassis shall be equipped with the following instruments and gauges. (Lights in lieu of gauges are not acceptable except as noted):

    a. Speedometer.

    b. Odometer which will give accrued mileage including tenths of miles.

    c. Voltmeter.

        (1) Ammeter with graduated charge and discharge with ammeter and its wiring compatible with generating capacities is permitted in lieu of voltmeter.

    d. Oil-pressure gauge.

    e. Water temperature gauge.

    f. Fuel gauge.

    g. Upper beam headlight indicator.

h. Brake indicator gauge. (vacuum or air).

(1) Light indicator in lieu of gauge permitted on vehicle equipped with hydraulic-over-hydraulic brake system.

i. Turn signal indicator.

2. All instruments shall be easily accessible for maintenance and repair.

3. Above instruments and gauges shall be mounted on instrument panel in such a manner that each is clearly visible to driver while in normal seated position in accordance with SBMI Design Objectives, May 1980 edition. (See Appendix)

4. Instrument panel shall have lamps of sufficient candlepower to illuminate all instruments and gauges and shift selector indicator for automatic transmission.

OIL FILTER

1. Oil filter of replaceable element or cartridge type shall be provided and shall be connected by flexible oil lines if it is not of built-in or engine mounted design. Oil filter shall have capacity of approximately one (1) quart.

OPENINGS

1. All openings in floorboard or firewall between chassis and passenger-carrying compartment, such as for gearshift lever and parking brake lever, shall be sealed.

PASSENGER LOAD

1. Actual gross vehicle weight (GVW) is the sum of the chassis weight, plus the body weight, plus the driver's weight, plus total seated pupil weight.

   a. For purposes of calculation, the driver's weight is 150 pounds.

   b. For purposes of calculation, the pupil weight is 120 pounds per pupil.

2. Actual Gross Vehicle Weight (GVW) shall not exceed the chassis manufacturer's gross vehicle weight rating (GVWR) for the chassis.

3. Manufacturer's gross vehicle weight rating shall be furnished in duplicate (unless more are requested) by manufacturer to the state agency having pupil transportation jurisdiction. State agency shall, in turn, transmit such ratings to each other state agency responsible for development or enforcement of state standards for school buses.

POWER AND GRADEABILITY

1. Gross Vehicle Weight (GVW) shall not exceed 185 pounds per net published horsepower of the engine at the manufacturer's recommended maximum number of revolutions per minute.

SHOCK ABSORBERS

1. Bus shall be equipped with front and rear double-acting shock absorbers compatible with manufacturer's rated axle capacity at each wheel location.

SPRINGS

1. Capacity of springs or suspension assemblies shall be commensurate with chassis manufacturer's gross vehicle weight rating.

2. If rear springs are used, they shall be of progressive type.

STEERING GEAR

1. Steering gear shall be approved by chassis manufacturer and designed to assure safe and accurate performance when vehicle is operated with maximum load and at maximum speed.

2. Steering mechanism shall provide for easy adjustment for lost motion.

3. No changes shall be made in steering apparatus which are not approved by chassis manufacturer.

4. There shall be clearance of at least 2 inches between steering wheel and cowl instrument panel, windshield, or any other surface.

5. Power steering is optional.

6. The steering system shall be designed to provide for means for lubrication of all wear-points.

TIRES AND RIMS

1. Tires and rims of proper size and tires with load rating commensurate with chassis manufacturer's gross vehicle weight rating shall be provided.

2. Dual rear tires shall be provided on Type B, Type C, and Type D school buses.

3. All tires on any given vehicle shall be of same size and ply rating.

4. If vehicle is equipped with spare tire and rim assembly, it shall be of the same size as those mounted on the vehicle.

5. If tire carrier is required, it shall be suitably mounted in accessible location outside passenger compartment.

TRANSMISSION

1. When automatic or semi-automatic transmission is used, it shall provide for not less than three forward speeds and one reverse speed.

2. When manual transmission is used, second gear and higher shall be synchronized except when incompatible with engine power. A minimum of three forward speeds and one reverse speed must be provided.

TURNING RADIUS

1. Chassis with a wheel base of 264 inches or less shall have a right and left turning radius of not more than 42½ feet, curb to curb measurement.

2. Chassis with a wheelbase of 265 inches or more shall have a right and left turning radius of not more than 44½ feet, curb to curb measurement.

UNDERCOATING

1. Chassis manufacturer shall coat undersides of front fenders (unless fenders are constructed of a non-corrosion material) with compound to prevent rust which meets or exceeds Federal Specifications TT–C–520a (see Appendix), using modified test procedures as defined under "Undercoating" of body standards.

WEIGHT DISTRIBUTION

1. Weight distribution of fully loaded bus on level surface shall be such so as not to exceed the manufacturer's front Gross Axle Weight Rating and rear Gross Axle Weight Rating.

BODY STANDARDS

THE BUS BODY

AISLE

1. Minimum clearance of all aisles shall be 12 inches. EXCEPTION: Type A Vehicle

2. The seat backs shall be slanted sufficiently to give aisle clearance of 15 inches at tops of seat backs.

BATTERY

1. Battery is to be furnished by chassis manufacturer.

2. When battery is mounted as described in Electrical System 1, Battery of Chassis Standard, the body manufacturer shall securely attach battery on slide-out or swing-out tray in a closed, vented compartment in the body skirt, whereby battery may be exposed to outside for convenient servicing. Battery compartment door or cover shall be hinged at front or top and secured by adequate and conveniently operated latch or other type fastener.

BUMPER (FRONT)

See Chassis Section

BUMPER (REAR)

1. Bumper shall be of pressed steel channel or equivalent material at least 3/16-inch thick and 8 inches wide (high), and of sufficient strength to permit pushing by another vehicle without permanent distortion.

2. It shall be wrapped around back corners of bus. It shall extend forward at least 12 inches, measured from rear-most point of body at floor line.

3. Bumper shall be attached to chassis frame in such manner that it may be easily removed, shall be so braced as to develop full strength of bumper section from rear or side impact, and shall be so attached as to prevent hitching of rides.

4. Bumper shall extend at least one inch beyond rear-most part of body surface measured at floor line. EXCEPTION: Type A Vehicles

CEILING

See Insulation and Interior

CHAINS

See Wheelhousing

COLOR

The school bus body shall be painted a uniform National School Bus Yellow. (See Appendix)

The body exterior paint trim, bumper, lamp hoods (if any) emergency door arrow, and lettering shall be black. As an alternative, the rear bumper may be covered with reflective material.

CONSTRUCTION

1. Construction shall be of prime commercial quality steel or other metal or material with strength at least equivalent to all-steel as certified by bus body manufacturer.

2. Construction shall provide reasonably dustproof and water-tight unit.

DEFROSTERS

1. Defrosting and defogging equipment shall direct a sufficient flow of heated air onto the windshield, the window to the left of the driver and the glass in the viewing area directly to the right of the driver to reduce the amount of frost, fog and snow. The defroster unit shall have a separate blower motor in addition to the heater motors. EXCEPTION: Type A Vehicles

2. The defrosting system shall conform to Society of Automotive Engineers Standards J-381 and 382. (See Appendix)

3. The defroster and defogging system shall be capable of furnishing heated outside ambient air except that part of the system furnishing additional air to the windshield, entrance door and step-well may be of the recirculating air type.

4. Auxiliary fans are not to be considered as a defrosting and defogging system.

5. Portable heaters may not be used.

6. Auxiliary Fans—If Used

    a. Auxiliary fan for the left side shall be placed in a location where it can be adjusted to its maximum effectiveness.

    b. Auxiliary fan for the right side shall be in a location where it can be adjusted to its maximum effectiveness.

    c. These fans shall be a nominal six-inch diameter.

    d. The blades of these fans shall be covered with a protective cage. Each of these fans shall be controlled by a separate switch.

DOORS

1. Service Door:

   a. Service door shall be under control of driver, and designed so as to afford easy release and prevent accidental opening. When hand lever is used, no part shall come together so as to shear or crush fingers.

   b. Service door shall be located on right side of bus opposite driver and within direct view of driver.

   c. Service door shall have minimum horizontal opening of 24 inches and minimum vertical opening of 68 inches. EXCEPTION: Type A Vehicles

   d. Service door shall be of split type, sedan type, or jack-knife type. (Split-type door includes any sectioned door which divides and opens inward or outward.) If one section of split-type door opens inward and the other opens outward, front section shall open outward.

   e. Lower as well as upper panels shall be of approved safety glass. Bottom of lower glass panel shall not be more than 35 inches from ground when bus is unloaded. Top of upper glass panel shall not be more than 6 inches from top of door. EXCEPTION: Type A Vehicles

   f. Vertical closing edges shall be equipped with flexible material to protect children's fingers. EXCEPTION: Type A Vehicles

   g. There shall be no door to left of driver. EXCEPTION: Type A Vehicles

   h. All doors shall be equipped with a padding at the top edge of each door opening. Pad shall be at least 3 inches wide and 1 inch thick and extend the full width of the door opening.

2. Emergency Doors:

   a. Emergency door shall be hinged on right side if in rear end of bus and on front side if on left side of bus. It shall open outward and shall be labeled inside to indicate how it is to be opened. EXCEPTION: Type A and B Vehicles

   b. Upper portion of emergency door shall be equipped with approved safety glazing, exposed area of which shall be not less than 400 square inches.

   c. There shall be no steps leading to emergency door.

d. Words "EMERGENCY DOOR", both inside and outside in letters at least 2 inches high, shall be placed at top of or directly above the emergency door or on the door in the metal panel above the top glass.

FIRE EXTINGUISHERS

1. The bus shall be equipped with at least one pressurized, dry chemical-type fire extinguisher, mounted in a bracket and located in the driver's compartment and readily accessible to the driver. A pressure guage shall be mounted on the extinguisher as to be easily read without removing the extinguisher from its mounted position.

2. The fire extinguisher shall be of a type approved by the Underwriters Laboratories, Inc. (See Appendix) with a total rating of not less than 2 A-10 BC. The operating mechanism shall be sealed with a type of seal which will not interfere with the use of the fire extinguisher.

FIRST AID KIT

1. Bus shall have a removable, moisture and dustproof first-aid kit mounted in an accessible place within driver's compartment. This place shall be marked to indicate its location.

2. Number of units and contents shall be designated by proper state authorities from, but not limited to, the following items:
2 single units—1-inch × 2½ yards adhesive tape
2 single units—sterile gauze pads 3 in. × 3 in. (12 per unit)
1 single unit—¾ in. × 3 in. adhesive bandage (100 per unit)
1 single unit—2″ bandage compress (12 per unit)
1 single unit—3″ bandage compress (12 per unit)
2 single units—2″ × 6 yds. sterile gauze roller bandage
2 single units—nonsterile triangular bandage approximately 40 in. × 36 in. × 54 in. with 2 safety pins
3 single units—sterile gauze 36 in. × 36 in. (U.S.P. 2428 count)
3 single units—sterile eye pad (1 per unit) 1 pair scissors

FLOOR

Floor in underseat area, including tops of wheelhousing, driver's compartment, and toeboard, shall be covered with rubber floor covering or equivalent having minimum overall thickness of .125 inch.

Floor covering in aisle shall be of aisle-type rubber or equivalent, wear-resistant, and ribbed. Minimum overall thickness shall be .187 inch measured from tops of ribs.

Floor covering must be permanently bonded to floor and must not crack when subjected to sudden changes in temperature. Bonding or adhesive material shall be waterproof and shall be of type recommended by manufacturer of floor-covering material. All seams must be sealed with waterproof sealer.

HEATERS

1. Heaters shall be of hot-water type or combustion type.

2. If only one heater is used, it shall be of fresh-air or combination fresh-air and recirculating type.

3. If more than one heater is used, additional heaters may be of recirculating air type.

4. The heating system shall be capable of maintaining throughout the bus temperature of not less than 40 degrees fahrenheit at average minimum January temperature as established by the U.S. Department of Commerce, Weather Bureau, for the area in which the vehicle is to be operated.

5. All heaters installed by body manufacturers shall bear a name plate that shall indicate the heater rating in accordance with SBMI Code 001, with said plate to be affixed by the heater manufacturer which shall constitute certification that the heater performance is as shown on the plate. EXCEPTION: Does not apply to vehicles not originally manufactured as school buses.

6. Heater hoses shall be adequately supported to guard against excessive wear due to vibration. The hoses shall not dangle or rub against the chassis or sharp edges and shall not interfere with or restrict the operation of any engine function. Heater hose shall conform to SAE J20c. Heater lines on the interior of bus shall be shielded to prevent scalding of the driver or passengers.

7. Each hot water heater system shall include a shutoff valve installed in the pressure and return lines at the engine. There shall be a water flow regulating valve installed for convenient operation by the driver. EXCEPTION: Type A Vehicles

8. All combustion-type heaters shall be approved by Underwriters Laboratories. (See Appendix).

IDENTIFICATION

1. Body shall bear words "SCHOOL BUS" in black letters at least 8 inches high on both front and rear of body or on signs attached thereto. Lettering shall be placed as high as possible without impairment of its visibility. Lettering shall conform to "Series B" of Standard Alphabets for highway signs.

2. Only signs and lettering approved by state law or regulation, limited to name of owner or operator and any number necessary for identification, shall appear on sides of bus.

INSIDE HEIGHT

Inside body height shall be nominal 72-inches or more, measured metal to

metal, at any point on longitudinal center line from front vertical bow to rear vertical bow. EXCEPTION: Type A and B Vehicles

INSULATION

Ceiling and walls shall be insulated with proper material to deaden sound and to reduce vibration to a minimum. If thermal insulation is specified also, it shall be of fire-resistant material of type approved by Underwriters Laboratories, Inc. (See Appendix)

If floor insulation is required it may be 5-ply, at ⅝ -inches thick and/or it shall equal or exceed properties of exterior-type softwood plywood, C - D Grade as specified in standard issued by U.S. Department of Commerce. (See Appendix)

INTERIOR

1. Interior of bus shall be free of all unnecessary projections likely to cause injury. This standard requires inner lining on ceilings and walls. If ceiling is constructed so as to contain lapped joints, forward panel shall be lapped by rear panel and exposed edges shall be beaded, hemmed, flanged, or otherwise treated to minimize sharp edges.

2. Flammability of interior materials is covered by Federal Motor Vehicle Safety Standard No. 302.

LAMPS AND SIGNALS

1. Lamps on exterior of vehicle are covered by Federal Motor Vehicle Safety Standard 108.

2. Interior Lamps. Interior lamps shall be provided which adequately illuminate aisle and step-well.

3. School Bus Alternately Flashing Signal Lamps:

Definition: School bus red signal lamps are alternately flashing lamps mounted horizontally both front and rear, intended to identify a vehicle as a school bus and to inform other users of the highway that such vehicle is stopped on highway to take on or discharge school children.

School bus yellow signal lamps are alternately flashing lamps mounted horizontally both front and rear, intended to identify a vehicle as a school bus and to inform other users of the highway that such vehicle is about to stop on highway to take on or discharge school children.

a. Bus shall be equipped with two red lamps at rear of vehicle and two red lamps at front of vehicle.

b. In addition to four red lamps described in (a) above, four amber lamps shall be installed as follows: one amber lamp shall be

located near each red signal lamp, at same level, but closer to vertical centerline of bus; system of red and amber signal lamps shall be wired so that amber lamps are energized manually, and red lamps are automatically energized (with amber lamps being automatically de-energized) when bus service door is opened.

c. Area around lens of each alternately flashing signal lamp and extending outward approximately 3 inches shall be painted black. In installations where there is no flat vertical portion of body immediately surrounding entire lens of lamp, a circular or square band of black approximately 3 inches wide, immediately below and to both sides of lens, shall be painted on body or roof area against which signal lamp is seen (from distance of 500 feet along axis of vehicle).

d. All flashers for alternately flashing red and amber signal lamps shall be enclosed in the body in a readily accessible location.

4. Turn signal and stop lamps.

a. Bus body shall be equipped with rear turn signal lamps which are at least seven(7) inches in diameter and meet specifications of the Society of Automotive Engineers. (See Appendix) These signals must be connected to the chassis hazard warning switch to cause simultaneous flashing of turn signal lamps when needed as vehicular traffic hazard warning. Turn signal lamps are to be placed as wide apart as practical and their centerline shall be approximately eight (8) inches below the rear windows. EXCEPTION: Type A Vehicle lamps must be 21 square inches in lens area.

b. Just inside the turn signal, there shall be installed at the same elevation, two seven (7) inch diameter stop lamps.

5. On all buses equipped with a monitor which monitors the front and rear lamps of the school bus, the monitor shall be mounted in full view of the driver. If the full circuit current passes through the monitor, each circuit shall be protected by a fuse or circuit breaker against any short circuit or intermittent shorts.

6. White Flashing Strobe Light: A white flashing strobe light, when installed, is intended to increase the visibility of the school bus on the highway during adverse visibility conditions. It shall have a single clear lens emitting light 360° around its vertical axis. It shall be located on the longitudinal centerline of the bus roof approximately ⅓ to ½ of the distance forward from the rear of the bus. It shall be controlled by a manual switch located in the instrument panel to the left of the driver. A pilot light shall indicate to the driver that the light is turned on.

7. Warning Device: Each school bus shall contain at least three (3)

reflectorized triangle road warning devices mounted in an accessible place in the driver's compartment. EXCEPTION: In Type A Vehicles the mounting location is optional.

METAL TREATMENT

All metal used in construction of bus body shall be zinc- or aluminum-coated or treated by equivalent process before bus is constructed. Included are such items as structural members, inside and outside panels, door panels, and floor sills; excluded are such items as door handles, grab handles, interior decorative parts, and other interior plated parts.

All metal parts that will be painted shall be (in addition to above requirements) chemically cleaned, etched, zinc-phosphate-coated, and zinc-chromate or epoxy primed or conditioned by equivalent process.

In providing for these requirements, particular attention shall be given lapped surfaces, welded connections of structural members, cut edges, punched or drilled hole areas in sheet metal, closed or box sections, unvented or undrained areas, and surfaces subjected to abrasion during vehicle operation.

As evidence that above requirements have been met, samples of materials and sections used in construction of bus body, when subjected to 1000-hour salt spray test as provided for in latest revision of ASTM designation; B-117 "Standard Method of Salt Spray (Fog) Testing" (See Appendix), shall not lose more than 10 percent of material by weight.

MIRRORS

Interior Mirror: Interior mirror shall be either clear view laminated glass or clear view glass bonded to a backing which retains the glass in the event of breakage. Mirror shall be a minimum of 6″ × 30″. Mirror shall have rounded corners and protected edges.

Exterior Mirrors: Each bus shall have a minimum of one exterior left side and one exterior right side rear view mirror with a minimum of 50 square inches each of flat mirror glass. EXCEPTION: Type A and B Vehicles shall be manufacturer's standard.

Each bus shall have a minimum of one exterior right side convex mirror with a minimum of 35 square inches to provide localized vision on the right side of the bus.

Cross-over Vision Mirror: When a rod 30 inches long is placed upright on the ground at any point along a traverse line 1 foot forward of the forward-most point of a school bus and extending the width of the bus: at least 7½ inches of the length of the rod shall be visible to the driver, either by direct view or by means of an indirect visibility system.

MOUNTING

Chassis frame shall support rear body cross member. Bus body shall be

attached to chassis frame at each main floor sill, except where chassis components interfere, in such manner as to prevent shifting or separation of body from chassis under severe operation conditions.

OVERALL LENGTH

Overall length of bus shall not exceed 40 feet.

OVERALL WIDTH

Overall width of bus shall not exceed 96 inches excluding accessories.

RUB RAILS

1. There shall be one rub rail located on each side of bus approximately at seat level which shall extend from rear side of entrance door completely around bus body (except emergency door) to point of curvature near outside cowl on left side.

2. There shall be one rub rail located approximately at floor line which shall cover same longitudinal area as upper rub rail, except at wheelhousing, and shall extend only to radii of right and left rear corners.

3. Both rub rails shall be attached at each body post and all other upright structural members.

4. Both rub rails shall be 4 inches or more in width, shall be of 16-gauge steel or suitable material of equivalent strength, and shall be constructed in corrugated or ribbed fashion.

5. Both rub rails shall be applied outside body or outside body posts. Pressed-in or snap-on rub rails do not satisfy this requirement. EXCEPTION: For Type A and B Vehicles using chassis manufacturer's body, or Type C and D buses using rear luggage or rear engine compartment, rub rails need not extend around rear corners.

SANDERS

Where required or used, sanders shall:

1. Be of hopper cartridge-valve type.

2. Have metal hopper with all interior surfaces treated to prevent condensation of moisture.

3. Be of at least 100 pound (grit) capacity.

4. Have cover on filler opening of hopper, which screws into place, sealing unit airtight.

5. Have discharge tubes extending to front of each rear wheel under fender.

6. Have no-clogging discharge tubes with slush-proof, non-freezing rubber nozzles.

7. Be operated by electric switch with telltale pilot light mounted on instrument panel.

8. Be exclusively driver-controlled.

9. Have gauge to indicate hoppers need refilling when they are down to one-quarter full.

SEAT BELT FOR DRIVER

Seat belt for driver shall be provided. Belt shall be equipped with retractor on each side of sufficient quality and strength to keep it retracted and off floor when not in use.

SEATS AND CRASH BARRIERS

1. All seats shall have minimum depth of 15 inches.

2. In determining seating capacity of bus, allowable average rump width shall be:

   a. 13 inches where 3-3 seating plan is used.

   b. 15 inches where 3-2 seating plan is used.

3. Seat, seat back cushion and crash barrier shall be covered with a material having 42-ounce finished weight, 54 inches width, and finished vinyl coating of 1.06 broken twill, or other material with equal tensile strength, tear strength, seam strength, adhesion strength, resistance to abrasion, resistance to cold, and flex separation.

STEERING WHEEL

(See Chassis)

STEPS

1. First step at service door shall be not less than 12 inches and not more than 16 inches from ground, based on standard chassis specifications.

2. Service door entrance may be equipped with two-step or three-step step-well. Risers in each case shall be approximately equal. When plywood floor is used on steel, differential may be increased by thickness of plywood used.

   a. When three-step step-well is specified the first step at service door shall be approximately 10 to 14 inches from the ground when bus is empty, based on standard chassis specifications.

3. Steps shall be enclosed to prevent accumulation of ice and snow.

4. Steps shall not protrude beyond side body line.

5. Grab handle not less than 10 inches in length shall be provided in unobstructed location inside doorway. EXCEPTION: Type A and B Vehicles. Steps (if any) on Type A and B Vehicles not manufactured originally as school buses may be manufacturer's standard.

STEP TREADS

1. All steps, including floor line platform area, shall be covered with 3/16-inch rubber floor covering or other materials equal in wear resistance and abrasion resistance to top grade rubber.

2. Metal back of tread, minimum 24-gauge cold roll steel, shall be permanently bonded to ribbed rubber; grooved design shall be such that said grooves run at 90-degree angle to long dimension of step tread.

3. Three-sixteenth-inch ribbed step tread shall have a 1½-inch white nosing as integral piece without any joint.

4. Rubber portion of step treads shall have following characteristics:

   a. Special compounding for good abrasion resistance and high coefficient of friction.

   b. Flexibility so that it can be bent around a ½ -inch mandrel both at 130-degrees F and 20-degrees F without breaking, cracking, or crazing.

   c. Show a durometer hardness 85 to 95.

STIRRUP STEPS

There shall be at least one folding stirrup step or recessed foothold and suitably located handles on each side of the front of the body for easy accessibility for cleaning the windshield and lamps except when windshield and lamps are easily accessible from the ground. Standard does not apply to vehicles not originally manufactured as school buses. A step, in lieu of the stirrup steps, is permitted in or on the front bumper.

STOP SIGNAL ARM

Stop signal arm, if used, shall meet the applicable requirements of Society of Automotive Engineers J1133. (See Appendix) Flashing lamps in stop arm shall be connected to the alternately red flashing signal lamp circuits. Manual, vacuum, electric or air operation of stop signal arm is optional.

STORAGE COMPARTMENT

If tools, tire chains and/or tow chains are carried on the bus, a container of

adequate strength and capacity may be provided. Such storage containe may be located either inside or outside the passenger compartment but, inside, it shall have a cover (seat cushion may not serve as this purpose capable of being securely latched and be fastened to the floor convenient t either the service or emergency door.

SUN SHIELD

Interior adjustable transparent sun shield not less than 6″ × 30 ″ with a finished edge shall be installed in a position convenient for use by driver EXCEPTION: Type A and B Vehicles.

TAILPIPE

Shall not extend beyond rear bumper.

UNDERCOATING

Entire underside of bus body, including floor sections, cross member, and below floor line side panels, shall be coated with rust-proofing compound for which compound manufacturer has issued notarized certification of compliance to bus body builder that compound meets or exceeds all performance requirements of Federal Specification TT-C-520a (See Appendix) using modified test procedures* for following requirements:

1. Salt spray resistance—pass test modified to 5% salt and 1,000 hours.
2. Abrasion resistance—pass.
3. Fire resistance—pass.

*Test panels are to be prepared in accordance with paragraph 4 6.12 of TT-C-520a with modified procedure requiring that tests be made on a 48-hour air cured film at thickness recommended by compound manufacturer.

Undercoating compound shall be applied with suitable airless or conventional spray equipment to recommended film thickness and shall show no evidence of voids in cured film.

VENTILATION

1. Body shall be equipped with suitable, controlled ventilating system of sufficient capacity to maintain proper quantity of air under operating conditions without opening of windows except in extremely warm weather.
2. Static-type non-closable exhaust ventilation shall be installed in low-pressure area of roof. EXCEPTION: Type A and B Vehicles.

WHEELHOUSING

1. The wheelhousing opening shall allow for easy tire removal and service.

2. Wheelhousing shall be attached to floor sheets in such a manner to prevent any dust, water, or fumes from entering the body. Wheelhousing shall be constructed of 16-gauge steel, or other material of equal strength.

3. The inside height of the wheelhousing above the floor line shall not exceed 12 inches.

4. The wheelhousing shall provide clearance for installation and use of tire chains on single and dual (if so equipped) power-driving wheels.

5. No part of a raised wheelhousing shall extend into the emergency door opening. EXCEPTION: Type A and B Vehicles.

WINDOWS

1. Each full side window shall provide unobstructed emergency opening at least 9 inches high and 22 inches wide, obtained by lowering window.

2. Push-out type, split-sash windows may be used.

WINDSHIELD WASHERS

A windshield washer system shall be provided.

WINDSHIELD WIPERS

1. A windshield wiping system, two-speed or more, shall be provided.

2. The wipers shall be operated by one or more air or electric motors of sufficient power to operate wipers. If one motor is used the wipers shall work in tandem to give full sweep of windshield.

WIRING

1. All wiring shall conform to current standards of Society of Automotive Engineers. (See Appendix)

2. Circuits:

   a. Wiring shall be arranged in circuits as required with each circuit protected by a fuse or circuit breaker. A system of color coding shall be used.

   b. Wiring shall be arranged in at least six regular circuits, as follows:

      (1) head, tail, stop (brake), and instrument panel lamps.

      (2) clearance and step-well lamps (step-well lamp shall be actuated when service door is opened).

(3) dome lamp.

(4) ignition and emergency door signal.

(5) turn signal lamps.

(6) alternately flashing signal lamps.

c. Any of above combination circuits may be subdivided into additional independent circuits.

d. Whenever heaters and defrosters are used, at least one additional circuit shall be installed.

e. Whenever possible, all other electrical functions (such as sanders and electric-type windshield wipers) shall be provided with independent and properly protected circuits.

f. Each body circuit shall be coded by number or letter on a diagram of circuits and shall be attached to the body in readily accessible location.

3. The entire electrical system of the body shall be designed for the same voltage as the chassis on which the body is mounted.

4. All wiring shall have an amperage capacity equal to or exceeding the designed load. All wiring splices to be done at an accessible location and noted as splices on wiring diagram.

5. A body wiring diagram of easy readable size shall be furnished with each bus body or affixed in an area convenient to the electrical accessory control panel.

6. Body power wire shall be attached to special terminal on the chassis.

7. All wires passing through metal openings shall be protected by a grommet.

8. Wires not enclosed within body shall be fastened securely at intervals of not more than 18 inches. All joints shall be soldered or joined by equally effective connectors.

SPECIAL EDUCATION VEHICLE STANDARDS

INTRODUCTION TO SPECIAL EDUCATION SCHOOL BUS OR MPV

The specifications in this section are intended to be supplementary to specifications in the chassis and body sections. In general, special education buses should meet all the requirements of those preceding sections plus those listed in this section. Since it is recognized by the entire industry that the field of transportation for special education passengers is characterized by special needs for individual cases and by a rapidly emerging technology for meeting these needs, a flexible, common-sense approach to the adoption and enforcement of specifications for these vehicles is prudent.

The Ninth National Conference recognized the rapidity of change in this area of transportation and addressed this fact by passing a resolution calling for special sessions at the 1981 NAPT/NASDPTS and NSTA Conferences to update the proceedings of the conference relating to minimum standards for special education school buses and auxiliary equipment.

By Federal Regulation, buses, including school buses, are defined as vehicles designed to carry ten or more passengers. Vehicles with less than ten passenger positions (including the driver) cannot be certified as buses. For this reason, the Federal vehicle classification Multipurpose Passenger Vehicle, or MPV, must be used by manufacturers in some cases for these vehicles in lieu of the classification School Bus. In determining passenger capacity, wheelchair positions are counted as passenger positions. This classification system while requiring compliance with a different set of Federal Standards for School Buses does not preclude the use of National School Bus Yellow paint or School Bus warning lamp systems.

GENERAL REQUIREMENTS

1. School buses designed for transporting children with special transportation needs shall comply with National Minimum Standards applicable to school buses. Because of the use of special equipment on these buses, certain modifications and/or exceptions in these standards shall be made, particularly in the bus body.

2. These standards address modifications as they pertain to school buses with a gross vehicle weight of ten thousand pounds or more and standard seating arrangement prior to modification that provides a capacity of ten or more children.

3. Any school bus that is used specifically for the transportation of children who are confined to a wheelchair and/or other mechanical restraining devices prohibiting their use of the regular service entrance, shall be equipped with a power lift.

4. Lift shall be located on the right side of the body, in no way attached to the exterior sides of the bus but confined within the perimeter of the school bus body when not extended.

SPECIAL SERVICE ENTRANCE

1. Bus bodies may have a special service entrance constructed in the body to accommodate a wheelchair lift for the loading and unloading of passengers.

2. The opening, to accommodate the special service entrance, shall be at any convenient point on the right (curb side) of the bus and far enough to the rear to prevent the door(s), when open, from obstructing the right front regular service door (excluding a regular front service door lift).

3. The opening may extend below the floor through the bottom of the body skirt. If such an opening is used, reinforcements shall be installed at the front and rear of the floor opening to support the floor and give the same strength as other floor openings.

4. The opening, with doors open, shall be of sufficient width to allow the passage of wheelchairs. The minimum clear opening shall be thirty (30) inches in width.

5. A drip moulding shall be installed above the opening to effectively divert water from entrance.

6. Entrance shall be of sufficient width and depth to accommodate various mechanical lifts and related accessories as well as the lifting platform.

7. Door posts and headers from entrance shall be reinforced sufficiently to provide support and strength equivalent to the areas of the side of the bus not used for service doors.

SPECIAL SERVICE ENTRANCE DOORS

1. A single door may be used if the width of the door opening does not exceed forty (40) inches.

2. Two doors shall be used if any single door opening would have to exceed forty (40) inches.

3. All doors shall open outwardly.

4. All doors shall have positive fastening devices to hold doors in the open position.

5. All doors shall be weather sealed and on buses with double doors, they shall be so constructed that a flange on the forward door overlaps the edge of the rear door when closed.

   If optional power doors are installed the design shall permit release of the doors for opening and closing by the attendant from the platform inside the bus.

6. When manually operated dual doors are provided the rear door shall have at least a one-point fastening device to the header.

   The forward mounted door shall have at least three-point fastening devices. One shall be to the header, one to the floor line of the body, and the other shall be into the rear door.

   These locking devices shall afford maximum safety when the doors are in the closed position.

   The door and hinge mechanism shall be of a strength that will provide for the same type of use as that of a standard entrance door.

7. Door materials, panels, and structural strength shall be equivalent to the conventional service and emergency doors. Color, rub rail extensions, lettering and other exterior features shall match adjacent sections of the body.

8. Each door shall have windows set in rubber compatible within one-inch of the lower line of adjacent sash.

9. Door(s) shall be equipped with a device that will actuate a green flashing visible signal located in the driver's compartment when door(s) is not securely closed and ignition is in "on" position.

10. A switch shall be installed so that the lifting mechanism will not operate when the lift platform door(s) is closed.

POWER LIFT

1. Lifting mechanism shall be able to lift minimum pay load of six hundred (600) pounds.

2. When the platform is in the fully up position, it shall be locked in position mechanically by means other than a support, or lug in the door.

3. Controls shall be provided that enable the operator to activate the lift mechanism from either inside or outside of the bus. There shall be a means of preventing the lift platform from falling while in operation due to a power failure.

4. Power lifts shall be so equipped that they may be manually raised in the event of power failure of the power lift mechanism.

5. Lift travel shall allow the lift platform to rest securely on the ground.

6. All edges of the platform shall be designed to restrain wheelchair and operator's feet from being entangled during the raising and lowering process.

7. Platform shall be fitted on both sides and rear with full width shields

(which extend above the floor line of the lift platform).

8. A restraining device shall be affixed to the outer edge (curb end) of the platform that will prohibit the wheelchair from rolling off the platform when the lift is in any position other than fully extended to ground level.

9. A self-adjusting, skid resistant plate shall be installed on the outer edge of the platform to minimize the incline from the lift platform to the ground level. This plate, if so designed, may also suffice as the restraining device described in item 8 above. The lift platform must be skid resistant.

10. A circuit breaker or fuse shall be installed between power source and lift motor if electrical power is used.

11. The lift mechanism shall be equipped with adjustable limit switches or by-pass valves to prevent excessive pressure from building in the hydraulic system when the platform reaches the full up position or full down position.

FASTENING DEVICES

1. Positive fastening devices shall be provided and attached to the floor or walls or both to insure that occupied wheelchairs or any other occupied types of ambulatory devices can be securely fastened in position.

RESTRAINING DEVICES

1. Seat frames may be equipped with attachments or devices to which belts, restraining harnesses, or other devices may be attached.

SPECIAL LIGHT

1. Lights shall be placed inside the bus to sufficiently illuminate lift area and shall be activated from door area.

AISLES

1. All aisles leading to the emergency door(s) from wheelchair area shall be of sufficient width (minimum thirty (30) inches) to permit passage of maximum size wheelchair.

SEATING ARRANGEMENTS

1. Flexibility in seat spacing to accommodate special devices shall be permitted due to the constant changing of passenger requirements.

GLAZING

1. Tinted glass may be installed in all doors, windows, and windshield. Tinted plastic may be installed in windows rear of the driver's compartment.

HEATERS

1. An additional heater(s) may be installed in the rear portion of the bus (behind wheel wells).

COMMUNICATIONS

1. All special education buses may be equipped with a two-way radio communication system.

REGULAR SERVICE ENTRANCE

1. In type "C" and "D" vehicles, there shall be three (3) step risers, of equal height, in the entrance well.

2. An additional fold-out step may be provided which will provide for the step level to be no more than six (6) inches from the ground level.

EXHAUST SYSTEM

1. The exhaust system shall be routed to the left of the right frame rail to allow for the installation of a lift mechanism that would travel through the floor on the right side of the vehicle.

TYPE A SCHOOL BUSES USED FOR SPECIAL TRANSPORTATION

1. This section pertains to vehicles of more than ten (10) persons capacity but less than ten thousand (10,000) pounds in GVW.

2. These vehicles shall meet the specifications of all the previous sections. EXCEPTION: In lieu of a power lift, a ramp device may be installed.

APPENDIX, VEHICLE

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(412)776-4841

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DIVISION OF TRUCK BODY AND EQUIPMENT ASSOCIATION
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(301)652-8004

UNDERWRITERS LABORATORIES, INC.
333 PFINGSTEN RD.
NORTHBROOK, ILLINOIS 60062
(312)272-8800

PRODUCT STANDARD PSI–66
U.S. DEPARTMENT OF COMMERCE
14th AND E STREETS
WASHINGTON, D.C. 20230

AMERICAN SOCIETY FOR TESTING AND MATERIALS
1916 RACE STREET
PHILADELPHIA, PA. 19103

FEDERAL SPECIFICATION TT–C–520a
GENERAL SERVICES ADMINISTRATION
SPECIFICATION AND CONSUMER INFORMATION DISTRIBUTION CENTER
WASHINGTON NAVY YARD
BUILDING 197
WASHINGTON, D.C. 20407

NATIONAL SCHOOL BUS YELLOW

The color known as National School Bus Yellow was designated as such by the 1939 National Conference on School Bus Standards. The National Bureau of Standards of the U. S. Department of Commerce assisted in developing this color and its colorimetric specifications, as follows:

C.I.E. Chromaticity coordinates		Daylight reflectance Y (%)			Dominant Wavelength (in millicrons)			Excitation Purity P (%)		
x	y	max.	std.	min.	max.	std.	min.	max.	std.	min.
.5211	.4549	–	41.	40.	584.5	583.5	582.5	–	93.7	89.0

At the 1980 Conference the colors in use were reviewed. A color standard was selected, slightly different from the above, and specific tolerances were chosen. These tolerances will insure a continuity of appearance from bus to bus, and within the same bus when different elements are finished or refinished at different times. Specification for the Standard Color, with light and dark tolerances (Upper and Lower Reflectances) are shown below in tabular form.

SPECIFICATION FOR STANDARD COLOR

For Source C				
CIE Chromaticity Coordinates		Reflectance Y (%)	Reflectance Tolerances	
			Upper	Lower
x	y			
.5089	.4408	40.14%	41.77%	38.45%

NATIONAL MINIMUM STANDARD GUIDELINES FOR SCHOOL BUS OPERATIONS

INTRODUCTION TO OPERATIONS

The purpose of this publication is to recommend basic standards for school bus operation for implementation by those with responsibilities in this vital educational function.

A successful school transportation operation depends upon a high quality of dedication and performance by all those who are associated with it. This includes the school administrator, transportation director, supervisor, contractor, vehicle maintenance and service personnel, teachers, passengers, the public, and, most importantly, the driver of the school bus.

As school transportation operations expand, the driving environment becomes more complex. Also, inflation escalates the cost of vehicles and repairs and fuel becomes less available and/or more expensive. Therefore, school administrators must meet the challange to maintain increasingly high standards of safety and performance for all elements of the school transportation systems.

Few of the practices recommended in this publication are discussed in the detail that should be spelled out in state and local regulations and procedures. The committee that developed these national guidelines was concerned with identifying some basic practices to which school administrators and others having school transportation and related responsibilities should adhere.

Hopefully, both experienced and inexperienced persons with pupil transportation related assignments will find this portion of the 1980 National School Bus Minimum Standards document interesting, inspirational and informational.

SCHOOL BUS OPERATIONS

I. ADMINISTRATION

A. The state agency(ies) responsible for pupil transportation should provide the following:

1. Leadership in the development of a comprehensive pupil transportation program for state-wide application.

2. A State Director of pupil transporation with the staff and other resources required to optimally perform the job.

3. A clear, concise pupil transportation policy.

4. A cost accounting system for all expenditures in the area of pupil transportation.

5. A state-wide management information system to accommodate pupil transportation data, i.e., costs, accidents and injuries, manpower availability, etc.

6. A promotion of pupil transportation safety program utilizing community, legislature, media, law-enforcement agencies and other state agencies concerned with pupil transportation.

7. A manual or handbook for local pupil transporation supervisors and school administrators containing detailed instructions for implementing the state's pupil transportation policies.

8. A manual or handbook for each school bus driver containing the state pupil transportation regulations.

9. A comprehensive school bus driver training program for both pre-service and inservice instruction.

10. A manual or handbook for school bus maintenance personnel.

11. Workshops, seminars and/or conferences for all pupil transportation personnel.

12. Encouragement for institutions of higher learning throughout the state to provide undergraduate and graduate courses in pupil transportation operation and safety. Instruction should be acceptable for certification purposes.

13. Safety and ridership curricula for pupil passengers.

14. Annual visits to local school systems to evaluate transportation systems and provide direction as necessary.

15. Bus and equipment standards that would be conducive to better and safer bus performance.

16. Coordination with other agencies having responsibility for pupil transportation services.

B. Local Administrators should:

1. Implement the state pupil transportation policy.

2. Become involved in the pupil transportation operation within their jurisdiction, including participation in training programs for all transportational personnel; review of school bus routes; provisions for supervision of loading and unloading areas at or near the school; investigation and reporting of accidents and other transportation problems and evaluation of the pupil transportation system. (Suggested action to be taken during and following observation of a school bus route appears at Appendix A.)

3. Provide resource material and require teachers to include instruction in passenger safety in the school curriculum, in compliance with Federal Standard 17.

4. Provide close continuous supervision of loading and unloading areas at or near the school and emergency evacuation drills.

5. Provide adequate supervision for pupils whose bus schedules require them to arrive at school before classes begin and/or remain after classes terminate.

6. Promote public understanding of, and support for, the school system's transportation program.

7. Develop local pupil transportation policies and regulations, including special education transportation policies.

II. PUPIL TRANSPORTATION DIRECTOR

A. State Pupil Transportation Director:

1. Specific duties include, but are not limited to:

a. Assist in implementing basic pupil transportation policies throughout the state.

b. Manage the state's pupil transportation program. This includes the ability to plan and budget for the operation and to forecast requirements.

c. Supervise the preparation of manuals or handbooks for local transportation personnel, and for school bus contractors.

d. Provide assistance to local school administrators upon request, and direction as may be necessary.

e. Assist in evaluation of state and local operations and provide recommendations when appropriate.

f. Plan and direct training for pupil transportation personnel.

g. Assist local personnel in planning and conducting workshops for pupil passenger safety.

h. Require and maintain appropriate reports and records.

B. Local Pupil Transportation Director and/or Private Operator:

1. Specific duties include, but are not limited to:

a. Provide assistance in planning, budgeting, and forecasting for the pupil transportation system.

b. Assist school officials in school site selection and plant planning.

c. Provide for chassis and body procurement when appropriate.

d. Develop and implement a plan for maintenance of equipment.

e. Recruit, select, instruct, and supervise personnel.

f. Route and schedule buses.

g. Assist in the development and implementation of safety instructional programs for pupils.

h. Work with administrators, teachers, transportation personnel, students, parents, and various public and private agencies to improve the quality of the transportation system.

i. Investigate and report accidents and other problems associated with the pupil transportation system.

j. Keep records and prepare reports.

k. Develop and supervise the implementation of an ongoing evaluation plan for the pupil transportation system.

2. The pupil transportation director and/or private operator should have an understanding of the educational process and the role of transportation in this process. Qualifications should include:

a. A satisfactory driving record as revealed through checks with the National Driver Register Service and the State Department of Motor Vehicles.

b. A satisfactory work history and a record free of criminal convictions. (The same type of checks should be made of the

applicant who seeks employment as a driver of a school bus.) Suggestions as to how this information may be obtained appear in Section III.

c. An undergraduate degree or equivalent experience in one or more of the following major fields of study: education, business administration, management, transportation, or a related field.

d. The ability to work effectively with a broad range of individuals and organizations.

e. The ability to manage personnel and resources to achieve a desired objective.

3. The school transportation director and/or private operator should receive formal instruction in pupil transportation management. This training should include classroom work and field experience.

III. DRIVER

A. There are certain duties that all school bus drivers are required to perform. These may include:

1. Safe and efficient operation of the vehicle.

2. Conduct thorough pre-trip and post-trip checks on the vehicle and its special equipment.

3. Maintain orderly conduct of passengers.

4. Meet emergency situations in accordance with operating procedures.

5. Communicate effectively with school staff and public.

6. Complete required reports.

7. Successfully complete training programs.

8. Provide maximum safety for passengers while on the bus and during loading and unloading.

9. Wearing seat belt when bus is in operation.

B. Procedures for selecting school bus drivers should include:

1. A proper application form on which information of a personal and occupational history is requested. (An example of a form that the school district may want to use to seek personal and work history information appears at Appendix B.)

2. A check of applicant's driving record. (Checks of the National

Driver Register and of the files of the State Department of Motor Vehicles are considered essential in the case of the individual who is applying for a position as a school bus driver.)

NOTE: The applicant should be told that these checks will be made before being asked to complete the application for employment. Establish criteria for rejection of persons with unacceptable driving records.

3. A check to determine if an applicant has a record of criminal convictions. Establish criteria for rejecting those with unacceptable convictions.

4. One or more personal interviews. (A properly conducted interview can be one of the most important of the selection procedures.)

5. A physical examination administered by a School Board approved licensed physician. Tests for TB and other communicable diseases should be included. The physical examination should be conducted annually and at such other times as the school superintendent may deem necessary. (An example appears in Appendix C.)

6. A determination of educational attainment. An applicant for position as a school bus driver should demonstrate the ability to follow detailed written instructions and the ability to record and report data accurately.

C. Instructional Program for School Bus Drivers:

1. Adequate classroom and behind-the-wheel training in a state approved pre-service training program that enables the applicant to handle the vehicle in a safe and efficient manner prior to transporting pupils shall be required.

2. Annual state approved in-service training program shall be required.

D. Each state should develop and make available to each school bus driver a driver's manual or handbook at the time of hiring. (see Section I). This manual should include the following subjects:

1. The transportation policy of the school system.

2. Motor vehicle rules and regulations applicable to school bus operation.

3. Vehicle operation and maintenance.

4. Procedure following involvement in, or approaching, a highway crash.

5. Rudiments of basic first aid procedures. Local school systems should supplement the state-produced manual with information on local policy and practices that may vary from, but should not

conflict with, state level requirements.

E. Behind-the-wheel instruction should be given in the same type and size bus the driver will be operating. When the driver will be expected to operate more than one size and type of vehicle, instruction should be given in the specific handling characteristics of each different vehicle. This instruction should include:

1. Familiarization with the bus and its equipment.
2. Emergency exit drills. (see Appendix D)
3. Use of the special warning and stop lamps and other traffic control devices.
4. Procedures for loading and unloading pupils at bus stops.
5. The necessity for cooperating with other highway users.
6. Entrance to and departure from loading and unloading areas at school buildings.
7. Entrance to and departure from the bus garage or other storage area.
8. Procedure for reporting mechanical difficulties.
9. Post-accident and post-road failure procedures.
10. Procedure for performing pre-trip and post-trip inspections.
11. Procedure for recognizing cause and effect relationship between driving habits and vehicle maintenance.

F. School bus drivers should be evaluated at regular intervals. These evaluations may include:

1. Written tests.
2. Road performance check.
3. Evaluation interviews.

IV. **BUS AIDE:** (See Special Education Section)

V. **MAINTENANCE AND SERVICE PERSONNEL**

A. Adequate staff should be employed to perform maintenance functions on a timely basis consistent with safe transportation practices.

B. Instructional Program for Maintenance and Service Personnel.

1. The transportation system should develop and make available to

maintenance and service personnel the required maintenance and service publications for the equipment being serviced.

2. The transportation system should arrange for pre-service and in-service training for maintenance and service personnel at regular intervals. They should also require or encourage maintenance personnel to attend state-sponsored workshops or training institutes. The training program should include instruction in:

   a. Preventive maintenance procedures.

   b. Repair procedures for each type of vehicle in the fleet and its special equipment.

   c. Service procedures for equipment.

   d. Inspection of the vehicle and its equipment.

   e. Recovery procedures for vehicles involved in an accident or breakdown.

   f. Preparation of maintenance records.

   g. A planned parts and equipment stock.

   h. Establishment of parts inventory control procedures.

VI. PUPIL MANAGEMENT

The program for pupil management should be developed cooperatively by responsible school administrators and transportation personnel. The program should be designed to insure the safety and welfare of all school bus passengers.

A. Policies should include but not be limited to:

   1. The bus driver's authority over, and responsibility for, pupils while in transit.

   2. The pupil's right to "due process" when disciplinary action is taken.

   3. The procedure for resolving problems when the driver needs assistance.

   4. The conditions under which a pupil might be temporarily suspended from the privilege of riding the bus.

   5. Procedures for handling emergencies.

   6. Use of bus monitors (or driver aides).

   7. Requirements and responsibility for school bus passenger and

pedestrian safety instruction.

8. Parental responsibility for damage to bus and/or equipment by their children.

B. Pupil Regulations:

Each school system should have a written set of regulations for transported pupils. These regulations should set forth standards of behavior and promote orderly conduct necessary for safe and efficient transportation. Regulations should include but may not be limited to:

1. Pupil shall arrive at the bus stop before the bus arrives.
2. Wait in a safe place, clear of traffic and away from where the bus stops.
3. Wait in an orderly line and avoid "horseplay."
4. Go directly to an available, or assigned seat when entering the bus.
5. Remain seated, keep aisles and exits clear.
6. Observe classroom conduct, and obey the driver promptly and respectfully.
7. Prohibit the use of profane language, eating and drinking of any type on the bus.
8. Prohibit the use of tobacco, alcohol or drugs and controlled substances.
9. Prohibit the throwing or passing of objects on, from or into buses.
10. Permit pupils to carry only objects that can be held on their laps.
11. Prohibit hazardous materials, objects and animals on the bus.
12. Respect the rights and safety of others.
13. Prohibit leaving or boarding the bus at locations other than the assigned home stop or assigned school.
14. Prohibit putting head, arms or objects out of bus windows.
15. Prohibit hooky-bobbing (hitching rides via rear bumper).

C. Behavior Control:

Proper pupil behavior is important. The distraction of the driver can contribute to accidents. Pupils and parents should be made aware of and abide by reasonable regulations to enhance safety. The conse-

quences of unacceptable behavior should be clearly understood. The following procedures will protect the pupil's rights and maintain order on the bus:

1. The bus driver should establish proper rapport.

2. The bus driver should handle minor infractions through discussion with pupils and/or assignment of seats. (Sometimes a call to the parents will improve behavior.)

3. In case of serious or recurring misconduct, the bus driver must describe the violations in writing on the appropriate forms to the person designated to deal with discipline.

4. First offenses require at least a notification to the pupil and parent(s) either by phone or in person. Second or subsequent offenses may require a conference with the pupil, parents, driver, and school administrator(s) and could result in some period of suspension of pupil's riding privileges.

5. Suspend pupil's riding privileges when the safe operation of the bus is jeopardized.

D. Instruction:

Most pupils ride school buses to and from school or on activity trips. It is important that all pupils be taught safe riding and pedestrian practices. This instruction should be given as soon as practical at the beginning of the school year. Appropriate instruction should be developed for each grade level and should include:

1. Safe walking practices to and from the bus stop.

2. Wearing of light-colored or reflective clothing when going to and from bus stop in darkness.

3. How and where to wait safely for the bus.

4. What to do if the bus is late, or does not arrive.

5. How to enter and leave the bus. (use hand rail, etc.)

6. Safe riding practices.

7. Procedures for emergency evacuation. (See appendix D)

8. Safely crossing the highway before boarding and after leaving the bus.

9. Procedures to follow in emergencies.

10. Proper respect for the rights and privileges of others.

VII. PROCEDURES

A. Policy. The responsible state agency and the local school system should have clear and concise policies concerning the conditions for the operation of contractor and/or public-owned school buses within local school systems. Following are examples of the subjects that should be treated in the policy document:

1. Procedure for determining eligibility for pupil transportation service.

2. Procurement of equipment and supplies, maintenance and inspection procedures, and time period over which equipment will be depreciated.

3. Driver recruitment, selection, instruction, placement, and supervision.

4. Determination of areas in which the school will provide transportation services.

5. Principles of routing, establishing stops, and scheduling buses.

6. Use of special lighting and signaling equipment on school buses.

   a. Alternately flashing signal lamps shall be used when the bus is stopping or stopped for the purpose of taking on or discharging passengers, as follows:

      (1) Alternately flashing amber lamps are to be used to warn motorists that the bus is stopping to take on or to discharge passengers.

      (2) Alternately flashing red lights are to be used to inform motorists that the bus is stopped on the roadway to take on or discharge passengers.

   b. When a stop arm is used, it shall be operated simultaneously with the flashing red signal lamps.

   c. A white flashing strobe light may be used to increase the visibility of the school bus on the highway during adverse visibility conditions.

7. Policy with regard to standees, the length of time in transit and the type of supervision to be provided while pupils are on the bus and at school prior to the beginning and following the end of classes.

   a. Each occupant shall be properly seated and no standees will be permitted while the bus is in motion.

8. Policy with regard to the transportation of non-public school pupils.

    a. Such policy shall be determined by State statute and/or State regulations.

9. Policy relative to the supervision of pupils while loading and unloading at school sites and while enroute.

    a. Local school districts shall be responsible for such policy development.

10. Procedure to be observed in the employment of adult monitors to supervise the loading, transportation, and unloading of pupils requiring special care.

11. Procedure for evaluating the school transportation system and how frequently this should be done.

B. School Site Selection and Plant Planning. When school sites are being selected, consideration should be given to the safety of pupils riding school buses. School buses will be required to utilize the roads in and around the school site, plus public roadways leading into and from the school area. High density traffic flow near school exits and entrances should be avoided. Proper site selection and plant planning for improved school transportation is extremely important. (See Appendix E) More specifically, school officials should provide:

    1. Separate and adequate space for school bus loading zones.

    2. Clearly marked and controlled walkways through school bus zones.

    3. Traffic flow and parking patterns separate from the boarding area.

    4. A separate loading area for wheelchairs.

    5. An organized schedule of loading areas with stops clearly marked.

    6. A loading and unloading site to eliminate the backing of transportation equipment.

See Appendix F, which may be used to evaluate school bus driveways in the vicinity of the school.

C. Routing and Scheduling. It is necessary to procure a map of the area served by a particular school or school system in order to establish bus routes that will adequately meet the needs of pupils in a particular area. Information on road conditions, railroad crossings, and other factors that might affect the particular operation should be recorded along with the location of homes and the number of school age children in each. (Recommended procedures for school bus drivers at railroad

crossings appear in Appendix G.) Satisfactory school bus stops must be identified along streets and highways where buses can travel with the least amount of risk. The number of pupils to be transported and the distance to be traveled are primary factors in allocating equipment for a particular area. Pupils should be assigned to specific stops according to walking distances, grade level, and the school attended. Special attention must be given to the handicapped: there are a number of possible approaches to laying out school bus routes. Five routing techniques are among the most frequently used. They emphasize the necessity for pupil safety program efficiency, and operational economy.

1. Shoestring Routes. The shoestring route holds the number of miles a pupil must ride to a minimum and is the most economical if the driver lives in the vicinity of the first pupil pick-up and works in or near the attendance center during the day.

2. Circular Routes. "Circular" routes enable the first pupil who boards the bus in the morning to be the first one to disembark in the evening.

3. Retracing Routes. Retracing routes should be avoided, except when pupils would be subjected to greater than ordinary risk crossing the road after alighting from the bus. In these instances, retracing will eliminate the need for the pupil to cross the roadway.

4. Double Routing. Double routing permits one bus to transport more than one load of pupils, but requires careful planning, including school scheduling.

5. Emergency Routes. Emergency routing should be established in all school systems. When weather or road conditions dictate that it is not safe to travel on other than hard-surfaced roads, an announcement can be made by radio or other means that such routings will be used on that particular day or days.

A survey should be conducted by the pupil transportation director for the purpose of identifying factors that might indicate a route change. After the survey is completed a time study should be made by driving over the route in the same equipment that will be used in the actual operation. The driver(s) who will operate over the route(s) should regard the trip as a "dry run." All scheduled stops should be made "live" and "dead" mileage should be recorded; distance and time between stops should be indicated, etc. These data, if obtained accurately, will permit the development of a schedule which probably will need little revision once it is placed into effect. After the route has been definitely established, a schedule showing individual stops should be available in the bus for the information of substitute drivers.

Each request for new or additional service should be investigated thoroughly before making a change. This investigation often

reveals characteristics about the area that would make a change in service unsatisfactory until certain conditions were corrected. It should be remembered that a stopped school bus presents a hazard when operating on thoroughfares where relatively high speeds or high traffic volume prevail. It is usually unwise for buses to take on or discharge passengers on main arteries.

Each stop should be established only after thorough investigation has revealed the location to be the most desirable in the area. It is considered poor practice to negotiate a "U turn" on main arteries of traffic even though provisions may have been made for such turns. The projection of the rear end of the bus into inside traffic lanes from medians that are too narrow to accommodate its length often create traffic interference that places the lives of transported pupils in jeopardy. Further, it is desirable to eliminate, insofar as possible, the necessity to turn the bus by backing. Bus stops should be located at a distance from the crest of a hill or curve to allow motorists traveling at the posted speed to stop within the sight distance. Additional precautions should include but may not be limited to the following:

a. Determine the location and destination of all pupils to be transported.

b. Provide the driver, the school of attendance, and the transportation office with the following information:

   (1) list of pupils on the bus(es).

   (2) approximate times for pick up and return of pupils.

   (3) map indicating routing of the bus and pupil locations.

c. Provide the parents or guardians of all pupils with the driver's name, bus number, pick up and return times, school closing information, school calendar, etc.

d. Determine the advisability of utilizing the concept of computerized scheduling.

e. Plan bus routes that will permit optimum pupil safety, program efficiency and operational economy.

D. Inspection of Equipment. A thorough and systematic inspection procedure is the essence of a planned preventive maintenance program. Daily routine inspection will alert the driver to the need for minor repairs and adjustments. Failure to conduct such inspections for any sustained period of time could result in more extensive repairs at a later date. Inspection, therefore, is an indispensable factor in a safe school transportation system.

The school bus driver is the key to an effective daily inspection program. It is the driver's responsibility to make a planned and

systematic inspection of the bus before each trip. A recommended procedure requires the conducting of both stationary and operating inspections. The following outline is not suggested as a model for use but is included as a guide for transportation personnel to use in developing a systematic inspection procedure.

1. Stationary Inspection

   a. Pre-starting inspection:

      (1) Observe the bus for evidence of oil, fuel, or water leaks, vandalism, etc.

      (2) Raise the hood and make sure the safety latch or hinge is in hold position, then check oil, water, belts, hoses, and wiring for frayed, cracked and/or deteriorated conditions.

   b. Walk-around inspection:

      Place the transmission in neutral and set the parking brake (fully depress the clutch pedal in manual transmission equipped vehicles). Start the engine and inspect the bus from top to bottom and end to end. Check for:

      (1) Tires: underinflated, flat, excessive wear or damaged.

      (2) Wheels: loose or missing nuts, excessive corrosion, cracks, or other damage.

      (3) Fluid leaks: evidence of wetness on inner wheels and tires.

      (4) Windshield and driver's side window: all school bus windows should be clean.

      (5) Mirrors: adequate view to the rear is essential for safety. They must be clean, properly aimed, and tightly adjusted.

      (6) Warning systems: running lights, back-up lights, all signals and signs, reflectors, turn signals, stop lights and warning flashers must be clean and working properly.

      (7) Exhaust system: sagging exhaust pipes, short and leaky tailpipes, and defective mufflers must be repaired and replaced.

      (8) Emergency exits: must be tightly sealed to prevent possible entrance of dangerous carbon monoxide fumes. (Check by opening and closing to keep hinges operational and to check functioning of warning buzzer.)

c. Inside safety check:

(1) The passenger compartment, seats, frames, emergency exits, and windows must be carefully checked.

(2) Inspect instruments and controls. With the engine operating, check the following:

(a) Vacuum or air pressure gauge or hydraulic indicator lights: these should indicate adequate capacity to operate brakes. Loss of air or hydraulic pressure or vacuum indicates a braking deficiency that must be corrected immediately.

(b) Oil pressure gauge: the engine should be turned off in the event of inadequate pressure and reported immediately.

(c) Warning lights:

1. Oil pressure warning light: prolonged displaying of the warning light is a signal of oil pressure problems and should be reported immediately.

2. Service brake warning light: a light on during the braking application indicates that the brake system is not operating properly.

3. Alternator/Generator warning light: a continuous light "on" after the engine is running indicates a malfunction in the charging system.

4. Ammeter and/or voltmeter: any continuous discharge should be reported immediately.

5. Water temperature gauge or warning light: the indicator should always read "cool" or "warm." If it indicates "hot" the engine should be stopped immediately. The same action should be taken if the temperature warning light goes "on."

d. Check each of the following for proper operation, adjustments, or condition:

(1) Directional signals.

(2) Stop lights and signals.

(3) Special warning lights.

(4) Emergency flashers.

(5) Clearance and marker lights.

(6) Headlights.

(7) Interior bus lights.

(8) Stop arm control, if so equipped.

(9) Windshield fan and defroster.

(10) Heaters.

(11) Horn.

(12) Service door and control.

(13) Rear view and side view mirrors.

(14) Fuses and emergency equipment.

(15) Driver's seat.

(16) Driver's seat belt.

(17) Fire extinguisher.

(18) First aid kit.

(19) Wipers/washers.

(20) Sanders, when equipped.

2. Operating Inspection. A planned road check enables the driver to evaluate the steering, suspension, clutch, transmission, driveline, engine, and brakes. The following items should be included when "road checking" the vehicle prior to transporting pupils:

   a. The Parking Brake: check by slowly engaging the clutch while the parking brake is "on." (In some air brake systems, the parking brake will remain applied if there is a partial or complete air pressure loss in the service brakes.)

   b. Transmission Operation: an automatic transmission should not slip and a manual transmission should allow for easy and smooth gear changes throughout the entire shifting range.

   c. The Clutch: the clutch should engage easily and smoothly without jerking, slipping excessively, or "chattering." A properly adjusted clutch should have some "free play" when the pedal is fully released.

d. Service Brakes: test at low speeds—bring the bus to a complete stop. It should stop in a "straight line" . . . without skidding, swerving, or pulling to one side.

e. The Engine: never race a cold engine. Instead increase speed slowly so that all parts may be properly lubricated.

f. The Steering: report any unusual ride or handling characteristics.

g. The Suspension: report any unusual ride or handling characteristics.

Not all drivers have the ability to spot every problem. But all school bus drivers, however, should make a thorough stationary and operating inspection of their bus each day. "Inspection" to them becomes an integral part of driving and they are always alert to any warning signal which tells them something is wrong. This continued alertness permits them to spot trouble and act accordingly before that trouble causes serious damage or contributes to an accident.

E. Maintenance of Equipment.

1. Teamwork and written policies are essential to a well organized maintenance program.

a. Strong and reasonable school bus maintenance policies should be adopted that will provide efficient guidelines for the following:

(1) director of transportation.

(2) maintenance personnel.

(3) operators of the vehicles.

b. Such policies should include the maintenance responsibilities of each person involved and should provide for a planned maintenance program.

2. Planned maintenance may be defined as scheduled maintenance that involves making minor repairs and adjustments which, if neglected, may develop into major difficulties, thereby necessitating extensive and expensive repairs in addition to the costly "down time."

a. Manufacturers' service manuals and warranty protection guidelines contain valuable information for successful preventative maintenance programs. These instructions and procedures should be carefully followed for maximum efficiency and safety in fleet operation. Vehicle manufacturers and component suppliers (transmission, electrical, etc. manu-

facturers) offer excellent training for fleet mechanics. Those interested in efficient operations will take advantage of these outstanding training programs.

b. Objectives of a planned maintenance program:

(1) keeping the vehicles in safe and efficient operating condition.

(2) preventing road failures.

(3) conserving fuel.

(4) lowering the maintenance cost by reducing the need for major repairs or overhaul.

(5) extending the useful life of the vehicle and its components.

(6) enhancing the appearance of school buses.

3. School districts or private contractors should develop a system whereby written communication would allow interchange and feedback relative to maintenance work needed and maintenance work completed. An efficient system should include:

a. Drivers report form to initiate needed maintenance.

b. Mechanic certification of completed work.

c. Method of permanently recording repairs and maintenance history of each vehicle.

F. Records

1. Accident records. The following should be included on all school bus accident report forms:

a. A signed and dated statement from the driver concerning the particulars of the accident.

b. A description and estimate of damage costs to all vehicles.

c. A list of all persons injured, including home addresses and home phone numbers, a description of personal injuries, and appropriate narrative explanations.

d. A list of passengers and witnesses, including addresses and phone numbers. A signed statement by witnesses is desirable, if obtainable. (Cards for witness signatures and statement should be carried in bus at all times.)

e. A description of drivers involved including name, date of

birth, sex, years of driving experience, license number, and occupation.

f. Cost of repairs and other type follow-up information should be added to the accident report wherever it is filed, i.e., in federal, state, or local offices, so that the record of the accident is complete. Other pertinent information relating to the accident that should be added later includes:

(1) disposition of any litigation.

(2) disposition of any summonses.

(3) net effects of all personal injuries sustained, including medical care, physician's fees, hospital expenses, etc.

(4) amount of property damage other than to vehicles involved

(5) action taken against the school bus driver, e.g., suspension or dismissal.

(6) summation of the driver's total accident record so that each completed report form will contain a listing of the total number of accidents that the driver has experienced.

2. Personnel Records. The following types of information should be maintained on all employees:

a. Employee

(1) application, including occupational history, present occupation, previous employment, age, sex, vehicle driving experience, marital status, military service record (if applicable), and formal training. (see Appendix B)

(2) confirmed work history.

(3) driving record.

(4) criminal record.

(5) military record (if applicable).

(6) physical examination (see Appendix C).

(7) training and testing.

(a) behind-the-wheel.

(b) knowledge.

(c) hours of instruction.

(8) payroll record.

(a) absences, cause.

(b) current wages.

(c) years of service.

(9) complaints, commendations, evaluations, etc.

b. Organizational

(1) number employed.

(2) number of staff employed by job.

(3) wage scales.

3. Route records

a. Type of routes.

(1) number.

(2) designation.

b. Route description.

(1) pickups, by locations and times.

(2) route time.

(3) type of vehicle required.

c. Route miles.

d. Special education pupils information to include medical history, medical procedures, and emergency phone numbers.

4. Maintenance records

a. Type.

(1) line setting tickets.

(2) work orders.

(3) preventative maintenance records.

b. Vehicle depreciation.

c. Equipment specifications.

5. Cost Records

a. vehicles.

b. type.

G. Emergency Procedures. Each school system should have an emergency plan. This plan should be carefully thought through and developed in cooperation with all those whose services would be required in the event of various types of emergencies. The school transportation director, school administrators, teachers, drivers, maintenance and service personnel, pupils, and others should be instructed in the procedures to be followed in the event of:

1. Accident. The plan should spell out precisely what is to be done, e.g., how to prevent further accidents; how to evacuate and control pupils; how to evaluate the need for medical assistance; how to get help from the police, the fire department, and the garage; and how to collect and record data essential to the preparation of the required accident reports. An operational plan to provide two-way communication with parents and/or guardians is imperative.

2. Sudden Disability of Driver. Procedures for handling situations resulting in the fatal injury or disability of the bus driver should be established and communicated to appropriate persons.

3. Road Failure. The emergency plan should cover the procedure for securing the bus, disposition and control of the passengers, diagnosing the cause(s) of the road failure, notification of school officials, securing alternate equipment, repair procedure and recovery of the disabled school bus.

4. Inclement Weather Conditions. The emergency plan should provide procedures for when the schools are to be closed or when the schools are to be closed early; the person responsible for making these decisions; how decisions are to be relayed to parents, pupil, school officials and staff (including teachers and cafeteria manager), drivers, contractors, maintenance and service personnel, the news media, and others. Other natural phenomena that might affect the school bus operation should also be included in the plan under this general heading, e.g., floods, hurricanes, and tornadoes.

5. Other Type of Emergency Situations. The emergency plan should cover such conditions and events as (a) civil defense drills; (b) strikes by school staff, teachers, drivers, or contractors; (c) road or bridge washouts and landslides that might block school bus routes; (d) bus hijacking. (Copies of the pre-emergency plan should be carried in each bus.) (See Appendix D for Instructions for Conducting Emergency Exit Drills.)

H. Communication. In the operation of a pupil transportation system, it is necessary to keep those who are in charge of the system as well as the parents and the pupils, informed regarding the operational procedures. The school system must ensure that the channels of communication are set up in such a way that any information that should be known about its transportation system and services can be disseminated quickly and effectively to reach everyone concerned. The school system must also ensure that all inquiries, requests, suggestions, and recommendations are given prompt and appropriate attention, and that they are handled efficiently. Some of the ways information regarding school bus systems can be disseminated satisfactorily, and examples of how each of these may be used to advantage are:

Method for Dissemination of Information	*Examples of Purposes for Which Used*
Bulletins:	To explain the school system's transportation policy to school administrators, teachers, drivers, parents, pupils, and others associated with the operation. To clarify new laws and safety policies so that everyone knows what is expected of them.
Meetings:	To provide an opportunity for those associated with the school transportation system to share their views to help build broad community support for safe pupil transportation.
Public Press:	To inform parents of policy, route, stop, and schedule changes; of the safety record of the operation; and positive driver achievement records.
Conferences:	To discuss with each driver, disruptive pupils and their parents, solutions to disciplinary problems that arise, new or revised policy decisions that affect drivers, contractors, pupils, and school administrators.
Letters:	To inform parents of all school and state regulations, new routes, etc. Reply to more urgent inquiries regarding pupil transportation safety, policy and procedures.
Telephone Calls:	To provide quick contact between bus drivers and the school, or between parents and the school in the event of urgent or emergency situations.
Radio, Television:	To inform the public of procedures the schools will follow in cases of severe weather conditions or other natural phenomena as well as new policies, laws, or controver-

sial decisions regarding laws and specifications. Excellent for positive news, ideas, and achievement.

Public Address System: Another tool the school personnel and drivers may utilize to communicate with pupils regarding all forms of safety reminders, rules, and school policy.

VIII. EVALUATION OF THE PUPIL TRANSPORTATION SYSTEM

A. Each school system should have a plan for evaluating its pupil transportation operation. (See Appendix H) There are several criteria which can be applied to obtain some estimates of the operation's effectiveness. These criteria relate to such factors as safety, efficiency, and economy.

1. Safety criteria include, but may not be limited to:

   a. Injuries to pupils, the driver, and other highway users.

   b. Frequency and severity of property damage accidents in which buses are involved.

   c. Frequency and severity of moving traffic violations for which drivers are cited.

   d. Frequency and nature of complaints from parents, the motoring public, school administrators and the pupils.

   e. Frequency and nature of road failures and other emergency situations involving buses.

2. Efficiency and economy criteria include, but may not be limited to:

   a. Route buses consistently operating within the framework of established school hours.

   b. Amount of driver layover time between routes. If, however, it can be scheduled, a brief layover period is desirable.

   c. Routes are equalized as nearly as possible and scheduled to minimize the actual time pupils are on the bus.

   d. Routes are designed to achieve maximum utilization, i.e., full capacity (within reason), and unnecessary mileage and duplication is eliminated.

   e. All routes and routing procedures including stops and times are reviewed annually.

   f. Written driver instructions, including pertinent information

relative to mechanical operation and specifics, such as warm-up and idling times, braking practices, etc.

3. Problem identification criteria include, but may not be limited to comprehensive long and short range transportation plans, which include goals and a needs assessment. Information to assist school administration toward this end may be found in Appendix H, Needs Assessment Overview.

IX. ACTIVITY BUS OPERATIONS.

Each school system that provides activity bus transportation for pupils shall have comprehensive policies and guidelines regarding this type of transportation. In order to provide safe and efficient activity transportation, lines of responsibility and authority need to be defined. Persons involved in activity trips must have an understanding of their respective responsibilities. For the purpose of this section, activity trip is defined to include field trips which are extensions of the instructional program, and other trips such as athletic and other outings. This trips range from a few miles to trips extended over several days that cover large distances.

The following items need to be considered when developing criteria for activity trip transportation.

A. Policies and Guidelines

1. Purpose of trip—

   Instructional, athletic, pupil spectators' recreation, or other.

2. Funding source—

   District or individual school funds, individual charge, parent group or other.

3. Administrative approval—

   Person who has authority to approve or deny trip.

4. Advance notification—

   Allow adequate time for approval process, and for making driver and vehicle arrangements.

5. Methods of travel—

   District or contractor bus, commercial or local transit district equipment, air, boat, or combination of above, private or school passenger automobile.

6. Trip request form—

   This should include all necessary information from trip arrange-

ments, payroll, reimbursement, and other local needs.

7. Chaperone—

   An adult chaperone should be required on all activity trips. Chaperone responsibilities include written authority to assist driver in maintaining passenger control. The drivers most always possess the final authority. Seating location for chaperones may also be a consideration.

8. Discipline procedures—

   Trip release signed by parents should include written procedures on handling of severe or difficult misbehavior problems, and emergency policies.

9. Communication—

   Drivers, pupils, chaperones and parents should be made aware of rules and regulations that apply on trip. Parents should have information on destination, mode of transportation, chaperones, departure and return times, and what the pupil is expected to wear and bring with them for the trip. A signed note from the parent or guardian is important.

10. Luggage—

    Method for transporting luggage or equipment forbidden to be carried in passenger compartment by state and/or local regulation. Loose luggage or equipment should never be transported in the passenger compartment which could cause injury or block passageways in the event of an accident or sudden maneuver.

11. Out-of-State Trips—

    Policy should detail if "out-of-state" trips are permitted and specific restrictions. Regulations for states to be visited should be reviewed prior to trip.

12. Insurance Policies—

    Should be checked or agents be contacted to determine if additional coverage is necessary. This is a necessity if a trip is scheduled to another state or country. If using transportation other than system owned vehicles, the board should set the minimum amount of insurance to be carried.

13. Road and Weather Check—

    Designate a person responsible for checking road conditions during months when adverse conditions could be encountered. State Patrol, Highway Divisions or auto clubs are generally cooperative in supplying road information. The Weather Bureau

should also be contacted if warranted.

14. Contingency Plans—

Policy should detail who has authority to make decisions if an unexpected occurrence happens during trip such as impassable roads, accident, or mechanical breakdown. Driver and chaperone should have phone number of local school person who has final authority. It is also advisable to obtain phone numbers of transportation personnel in various communities and school districts that trip buses travel through regularly. It is advisable to develop a Mutual Aid Directory for contacts within athletic league boundaries which could provide assistance in the event of a mechanical emergency. Drivers should have training on procedures and regulations if an accident occurs during trip.

15. Driving Hours—

Schools should have regulations based on common sense and/or Bureau of Motor Carrier Safety manual: i.e., 15 hours of duty of which 10 are driving time; 8 hours continuous off-duty prior to long trip, no more than 60 hours driving in a week.

16. Driver Selection—

Criteria for trip driver assignments is necessary to avoid conflict and confusion, knowledge, skill, experience, seniority and driver familiarity with trip vehicles. Driver knowledge of area to be traveled should also be a consideration. Driver assignment should take place at least 3 days in advance of trip date.

B. Vehicle and Equipment

1. Trip vehicles should be selected taking into consideration the following.

   a. Miles to be traveled.

   b. Terrain and climatic conditions which may be encountered.

   c. Number and age group of pupils.

   d. Luggage and equipment to be transported.

   e. Driver familiarity with the vehicle and route to be traveled.

2. Consideration should be given for specialized equipment needed such as:

   a. Luggage storage.

   b. Chains or sanders (chains should be prefitted prior to trip.)

c. Extra heaters.

d. Public address system.

e. Radio—A.M., C.B., or 2-way.

f. Tires, off road tread or recaps (original tires on front required).

g. Spare tire.

h. Tool requirements.

i. If an extended trip is planned, a phone call to transportation personnel at the destination is advisable to determine equipment requirements.

3. Inspection—

a. All vehicles should pass the same inspections as regular route buses as well as detailed check prior to activity trips.

C. Training

1. Specialized training should be provided for activity trip drivers. Training should include but may not be limited to the following items:

a. State laws and applicable policies and rules.

b. Familiarity with trip vehicle and its components.

c. Familiarity with specialized equipment and how to implement its use. (see B-2 above)

d. Familiarity with local and state trip requirements.

e. Route familiarization. This might include a dry run prior to the trip date, especially if extreme conditions, terrain or road difficulties may be encountered.

f. Discipline procedures on trips.

g. Driving under adverse conditions such as night driving, slippery road condition, or unfamiliar mountain driving.

h. Destination location and parking areas. Maps should be made available to drivers.

i. Destination parking if other than location of pupil destination.

j. Provisions for bus security at destination.

k. Necessity to carry extra cash for items such as: bridge tolls, fuel, telephone, parking fees, and personal needs.

l. Emergency procedures including a thorough knowledge of contingency requirements.

m. Other items a driver should know prior to driving an activity trip, e.g., pupil counts, report form completion, convoy procedures, prohibiting non-required signs inside or outside of bus, etc.

n. All activity bus drivers should hold the same licenses and certificates as a regular school bus driver. This might be in addition to a chauffeur's license if vehicle is a commercial carrier.

INTRODUCTION TO SPECIAL EDUCATION OPERATION

The purpose of this section of the report is to recommend minimum standard guidelines for those persons entrusted with the responsibility for transporting pupils requiring special care during the loading, unloading and transporting process. The term "special education" means specially designed courses of instruction and related support services, sufficient in both quantity and quality to meet the unique needs of handicapped children.

This section of the overall operations report is concerned with the identification of the multitude of practices and procedures that are relevant to the transportation of handicapped pupils. Special attention, for example, has been given to the development of general principles, the identification of the major characteristics of handicapped pupils, the noting of pupil needs relating to class placement, the behavioral actions that can be anticipated, the resulting corrective actions that must be taken, the types of medical concerns that must be dealt with in an efficient and professional manner, and the development of emergency pupil management procedures.

Few of the practices and procedures are discussed in detail. All, however, have been treated in sufficient depth to provide the administrator, the driver, and the aide with sufficient information to develop and administer a quality program service.

MINIMUM STANDARD GUIDELINES FOR SCHOOL BUS OPERATION: SPECIAL EDUCATION

INTRODUCTION

The term "special education" means specially designed instruction to meet the unique needs of a handicapped child. Transportation is one of the "related services" that is necessary to provide this instruction. The purpose of this document is to establish minimum standard guidelines of operation for those individuals involved in the transportation of the handicapped.

I. GENERAL PRINCIPLES

A. Pupil management encompasses all preparation and action taken to meet each pupil's needs while riding to and from school, in the interest of comfort and safety for all those aboard the bus. For the handicapped pupil, this means making a variety of adjustments to accommodate each one's individual needs without compromising the safety of the riders or the primary role of the driver—to drive the bus.

B. Transportation for handicapped pupils is a highly personalized service, requiring a thorough assessment of the pupils' physical, social, emotional, and intellectual capacities, and making allowances for existing handicaps.

C. Successful pupil management depends upon careful planning for each pupil's needs prior to placement and continued monitoring of the adjustments throughout the school year. Good pupil management techniques avoid the narrow, band aid approach of "What do I do when Johnny misbehaves on the bus?" by assessing needs and anticipating problems.

D. Mutual respect for, and communication and cooperation of drivers, parents, teachers, and other school officials will help to ensure safe, reliable, and comfortable transportation service. It is important to recognize that often the driver spends several hours a day with these pupils, thereby assuming a significant role in their lives.

II. CHARACTERISTICS OF HANDICAPPED PUPILS

A. The definition of the types of disabilities vary somewhat from State to State, but in general terms, the following behaviors are characteristic. Keep in mind that no one pupil is likely to manifest all of these behaviors.

1. Learning disabled pupils typically have average or higher intellectual ability, but suffer from disorders that prevent them from processing information, particularly language, in the usual manner. They may be disorganized or inefficient in solving problems. They may demonstrate impulsive or extreme emotional behaviors that seem out of proportion to the severity of the problem. Hyperactivity is also common among this population.

2. Emotionally disturbed pupils may have great difficulty controlling their own behavior. Emotional disturbance is characterized by very low self-esteem, and the pupil may either withdraw or act out his frustration and insecurity. Seemingly inappropriate types of duration of behavior may be observed, the seriousness of which should be discussed with the pupil's teacher. A limited number of clear, consistent rules will set goals for the pupil to regulate his own actions. Avoid angry outbursts and punishment, and never label a pupil "bad" when he/she misbehaves. Simply remind the pupil of what is expected and why, and reinforce proper behavior. A lack of stability from day to day in desirable behavior may be observed. This is not willful disobedience, but beyond the pupil's control.

3. Mental retardation encompasses a range of impairment from the mildly (educable) retarded through the trainable, and finally the severely and profoundly handicapped. Many pupils may have physical handicaps in addition to the mental handicaps, and may be afflicted by disorders involving poor motor coordination, seizures, and body tremors. Pupils may have few self-care skills,

and require aid in dressing, expressing themselves, and boarding the bus. They may be very friendly and affectionate. They need frequent reminders of bus rules because they have limited retention. Many pupils can understand what you tell them (possess receptive language) but cannot speak to you. You should insist that they use every mode of communication of which they are capable to make their needs known to you.

4. Physical handicaps can include deafness, blindness, paralysis, lack of head, trunk or back control, or erratic movement. These pupils may be of average or above intelligence, but are frequently behind in social and academic development due to their handicapping condition. Those with orthopedic handicaps often have leg braces, crutches, wheelchairs, or other supportive equipment. These pupils must be seated comfortably.

   a. Communication with pupils whose handicaps interfere with normal means of expression can pose a major challenge to the driver.

      (1) Visually handicapped pupils respond best when they are addressed by name, and when the events around them are described carefully. Remember that they cannot see facial expressions or other body language that constitutes a large part of communication for others. The visually impaired can develop self-sufficiency if their environment is structured in a stable and predictable way. They can fasten their own seat belts if they can find them on the same seat in the same position each day. They cannot easily recover them if they've fallen behind the seat, or if their seat changes and the seat belt is no longer there.

      (2) The deaf pupils use their visual skills to compensate for their hearing loss. Looking at them when you talk, and speaking clearly and distinctly will help them read your lips. Yelling does not help them understand. Facial expression and body language are very important; show them what you want. The drivers may wish to carry a pad and pencil to write down what the cannot otherwise convey. Those drivers who routinely transport deaf children may find a course in sign language valuable. Deaf children may find the noise level on their hearing aids uncomfortable, and turn them off. They will probably be most content if there are others on the bus with whom they can communicate. Hearing impaired children, along with visually impaired pupils, are unlikely to be much different from normal children in terms of behavioral problems.

B. Although the behaviors described above are characteristic of certain categories of disabling conditions, it is important to remember that each pupil is an individual, with his own distinct personality and that

no label can completely or adequately describe any pupil. It should also be noted that all handicapped pupils are people, and can be expected to behave and misbehave very much like normal children. The driver of handicapped children needs to be more flexible, patient, and creative in his/her approach to managing these pupils.

III. CLASS PLACEMENT

A. Class selection should include a routine consultation with transportation personnel to avoid bus problems that may later develop into classroom problems.

1. Some pupils may need to be transported in wheelchairs or specially designed car seats or vests to provide trunk and head support. The type of vehicle required must be ascertained in advance, and lead time may be needed to construct a device in which to transport the pupil.

2. The last consideration in planning is the mixture of pupils on the vehicle. In sparsely populated areas, it may be virtually impossible to group pupils on vehicles by disability, but this may be desirable in some instances.

B. After the class assignment is determined, the transportation supervisor should research the details of the pupil's transportation needs.

1. A thorough inventory of the pupil's needs should be taken by the school personnel in conjunction with the transportation director. This should include aspects of the pupil's personality and handicaps as they relate to the bus ride, and may determine such matters as seat assignments, order of stops, equipment needed, and techniques for effectively relating to the pupil. Seizures and other significant medical problems should be documented.

2. At this time, any deviation from normal schedules should be noted.

3. Arrangements should be made for alternate emergency drop-off points and telephone numbers. These last two points may seem more related to operations than pupil management, but not delivering the pupil to the right place at the right time can create anxiety in the pupil and his parents and undermine the driver's control of the situation.

4. Arrangements for each pupil's transportation should be communicated to all involved parties, including parents, school personnel, driver, aide, and the other pupils on the bus. A smooth start for bus service will help make the pupil's first day of school a positive experience and will instill confidence in the parent that will reflect well on the entire school system.

IV. DISCIPLINE AND BEHAVIOR CONTROL

A. A driver recognizes that safety of passengers and respect for person and property are still needed when handicapped children are transported. A pupil cannot be allowed to behave in any manner which endangers others or causes serious harm enroute.

B. Lenience or pity for the pupils because of their handicaps is counterproductive to the development of self-sufficiency. Many pupils can sense this attitude and manipulate it to their own advantage. Pupils must be taught to accept responsibility for their own actions. This can usually be accomplished if the following rules are obeyed:

1. Always let the pupils know what is expected of them. Define terms and rules clearly, and enforce the rules fairly, firmly, and consistently.

2. Let the pupils know exactly what the consequences of their behavior will be. Always follow through on the disciplinary action you threaten, or the pupils will quickly learn that your authority is not to be taken seriously.

3. Demonstrate, using as many modes as possible, what you want them to do. Don't just tell them to fasten their restraining devices, show them how to do it.

4. Accentuate the positive. Continually telling the pupils "don't do this" and "don't do that" leaves them wondering what they can do. On long bus rides that can be a tiring and boring experience, suggest methods of acceptable behavior.

C. Behavior modification is a technique that requires pupils to behave in an appropriate way before they are given some reward, thereby increasing the likelihood they will behave as desired. To be effective, such a program must take into consideration the ages of the pupils aboard, the nature of the reward, and a clear definition of what constitutes acceptable behavior.

1. It is generally a good policy to develop a simple reward system for good behavior. Liberal amounts of praise should be given as a general rule, but behavior modification techniques can be a more concrete, consistent way of maintaining control.

2. The driver can develop a chart to keep track on a weekly basis of who has behaved well and who has not, and a reward given to those with satisfactory ratings. This may be something simple like a smile face or a gold star on the chart, giving the pupil a preferred seat on the bus, or, with permission of both parent and teacher, some candy or other treat.

3. Some disruptive pupils respond well when given responsibility, such as leading the others in singing or a quiet game. This may channel excess energy into some more constructive although

limited activity that can be pursued safely on the bus ride.

D. Other techniques of behavior control involve relatively simple methods such as rearranging seating or isolating the troublemaker.

1. Seating arrangements on the bus can be important in managing handicapped pupils. A good driver will learn to know his/her pupils and seat those who get along well near each other.

   a. The seat closest to the front of the vehicle may be used either as a reward or as a punishment, depending on the attitude of the pupils. Younger pupils often perceive sitting near the driver as a privilege, and this may be granted as a reward for good behavior. Older pupils are more likely to view a front seat as undesirable, and it may then be used to isolate a troublemaker.

   b. An insightful choice of seat partners can help the driver manage pupils. For instance, a young hyperactive pupil may be seated with an older, well-behaved pupil. The older pupil is made to feel important by looking after his young charge, and the younger pupil may look up to the elder and behave better to impress him. A more advanced pupil may be able to sit with one who is easily distractible to "entertain" the other by talking or looking at a book.

   c. Very young or fragile pupils should be seated away from older, larger pupils who might harm them if they become angry or frustrated.

2. In cases of serious misbehavior, temporary suspension of bus privileges may be in order. This should only be done after consultation with parent and teacher, because in some cases this may mean a pupil might be left home unsupervised, or an adolescent may spend the day out on the streets getting into trouble rather than being in school. Suspension from the bus is usually most appropriate when the safety of other pupils is threatened by the pupil in question.

3. Most pupils respond best to rules if they have a voice in developing them. The driver may be able to tell the pupils that the bus is "their bus" and to encourage pride in making it a clean, safe, and enjoyable place to be. For those pupils who are able, the driver may have them suggest rules for the bus and the means of enforcing them. Often the pupils will be more strict in determining regulations that the driver would have been.

4. Cases of serious misbehavior which do not respond to any of the above methods may require referral to a school counselor or psychologist to develop a more personalized behavior management scheme for that pupil.

5. Behavior management systems will be most effective if developed

after consultation with the parents and teachers. It can be confusing and frustrating to the pupils if they are allowed to behave one way on the bus but not that way in the classroom. Cooperation of all concerned parties is the ideal way to achieve a safe bus environment.

V. MEDICAL CONCERNS

A. Handicapped pupils are often more susceptible to illness than regular pupils, and therefore miss school more often. They are often on medication for their disability. Normally, a driver should never administer this medication. It is strongly recommended that drivers of handicapped pupils enroll in a first-aid course to prepare themselves for medical emergencies that may arise along the route.

B. A change in the type of dosage of medication can dramatically alter a pupil's behavior. Sudden personality changes should be reported to the parent and teacher at the earliest possible time.

C. There are certain medical problems that may arise routinely on the bus ride, for which a driver should be prepared.

1. Many handicapped children are subject to convulsive disorders, or seizures. These can vary in intensity from a few-second (petit mal) blackout, often not even noticeable, to severe grand mal seizures, involving thrashing of arms, and body rigidity. Normally, seizures are self-limiting, and the driver's primary role should be to see that the pupil does not harm him/herself and rests comfortably afterward. Nothing should be placed in the pupil's mouth, nor should the limbs be restrained in any manner—this could result in broken bones. Extended seizures constitute a medical emergency, and medical help should be summoned.

2. Some pupils may be inclined toward respiratory difficulties and drooling, and may occasionally choke on their own saliva or foreign objects. The method of dealing with these problems should be discussed with the parent, teacher and medical personnel. Pupils may become nauseated on the bus ride so it is recommended that materials for clean-up be kept on the vehicle.

D. Most medical incidents on the bus ride, while requiring special attention of the driver or aide, will not necessitate summoning professional medical attention. Extended seizures and other serious medical matters may require either diverting the run to a medical facility or summoning an ambulance. In any event, all medically related incidents should be reported to the school and parents at the earliest possible moment.

VI. EMERGENCY PUPIL MANAGEMENT

A. It may be useful to educate those pupils who are capable of comprehending and retaining such information about emergency procedures.

It is possible that the driver may be incapacitated in an accident and a pupil may have to take over.

B. In those emergencies where the driver is not injured, it is important to assure the pupils that the situation is under control.

C. The most important preparation for pupil management in an emergency is preplanning.

1. Assess the abilities and handicaps of each pupil, and determine what each pupil's needs may be in an emergency.

2. Plan how to evacuate each pupil if this becomes necessary, determine what special attention might be needed after evacuation. For instance, those pupils normally tense and insecure may require special reassurance than what would be required for most pupils under such circumstances. The appearance of confidence on the part of the driver will help calm the pupils.

VII. SUMMARY OF SUCCESSFUL PUPIL MANAGEMENT

A. Take a conscious inventory of the abilities and handicapping conditions of each pupil, and gear the rules of the bus to each individual bus load of pupils.

B. Continuity and consistency of expectations by those in authority at home, in the classroom, and on the bus, will do much to aid the pupil in his social development, independence, self-esteem, and recognition and respect for the rights of others.

POLICY DEVELOPMENT

Develop pupil, driver and aide policies.

PUPIL POLICY:

1. Develop a written list of do's and don't's that you expect pupils to be aware of to ensure a safer, more enjoyable ride.

   A. Post in the bus.

   B. Print in pupil handbook.

   C. This may be written into an overall policy package that should have board approval.

DRIVER POLICY:

1. List all requirements that must be fulfilled prior to pupil transportation (license, physical, driving exam, written exams, license check, etc.).

2. List all requirements placed on the driver by the school system. Examples:

   A. Pre-trip inspection.

   B. Discipline.

   C. Records keeping.

   D. Contract provision, if any.

   E. Pupil safety.

   F. Knowledge and use of safety equipment.

3. List all requirements placed on the driver by state and/or federal legislation. Examples:

   A. School bus stop laws.

   B. Speed limits.

   C. Railroad crossing laws.

   D. Etc.

An entire policy package should be developed, approved and adopted by the Board of Education and implemented.

AIDE POLICY:

Aides should:

1. Be selected for their physical and emotional ability to cope with the situation(s) making the assignment of an aide to that particular bus necessary.

2. Receive special training regarding the needs of handicapped pupils and their role in caring for those needs in transit.

3. Work under the bus driver's direction to provide care and assistance to pupils as needed when entering and leaving the bus and during the bus ride.

4. Be sure that protective safety devices are properly fastened at all times.

5. Have available to them in the vehicle confidential data including:

   A. Pupil's name and address.

   B. Nature of pupil's handicap.

   C. Emergency health care information.

   D. Name and the phone number of pupil's physician, parent, or other person to be contacted in case of an emergency.

   E. Provisions for pupil's welfare if and when pupil is not met at the designated bus stop.

6. Be well versed in emergency procedures in the event the driver is incapacitated.

ROUTING AND SCHEDULING

1. Determine location and destination of all pupils to be transported.

2. Obtain information pertaining to individual needs for additional specialized equipment such as safety harnesses, seat belts, wheelchair, pupil safety seat, etc.

3. Plot the safest, most efficient route available avoiding high traffic areas, high accident areas, and road hazards.

4. Provide the drivers, the attending school, and the transportation office with the following information:

   A. List of pupils on the bus(es).

   B. Approximate times for pick-up and return of pupils.

C. Map indicating routing of the bus and location of pupils.

D. An identification form for each pupil with information such as pupil's name, parent or guardian name, address, phone number, location and description of home, medication, picture, etc.

5. Provide the parents or guardians of all pupils with the driver's name, bus number, pick-up and return times, school closing information, school calendar, etc.

6. Transportation of pupils in certain cases may require a contract between school systems and/or specifications of transportation in the pupil's I.E.P. (Individual Education Plan).

7. If computer scheduling is available, it should be assessed for possible utilization.

8. The goal of pupil transportation is to economically and efficiently operate with the optimum pupil safety and consistency.

COMMUNICATION

1. Determine what your schools needs are for communications.

2. Determine the geographical area to be covered and topographical features to contend with.

3. Determine which type of two way radio system, if used, will be functional.

APPENDIXES, OPERATIONS

Appendix A

ACTIONS TO BE TAKEN DURING AND FOLLOWING OBSERVATION OF SCHOOL BUS ROUTES

When the transportation director rides the school bus for purposes of observation, here are some of the actions that should be taken during and following this observation:

1. Check driver's route and schedule for accuracy.

2. Determine that the driver stops only at authorized stops.

3. Check for operation of vehicle in accordance with prescribed regulations.

4. Observe the driver-pupil relationship.

5. Check the conditions at the school for a satisfactory area to unload and load the students and evidence of supervision.

6. Note hazardous road conditions.

7. Note the nature, frequency, and locations of violations of the school bus stop law.

8. Observe condition of bus, e.g., cleanliness, tires, windows, emergency exit(s), first aid kits, fire extinguishers, seats, etc.

9. Note driver attitude toward other motorists and pedestrians. Following completion of observation, a report should be written, discussed with driver (and others, as appropriate), then filed with the driver's permanent record.

Appendix B

SCHOOL BUS DRIVER APPLICATION

(Example of a form that may be used)

Name_____
Present Address_____ Phone No. _____
How long have you lived at present address?_____
Last previous address_____
How long did you live there?_____ Social Security No. _____
Do you have any physical impairments that could interfere with the duties of a school bus operator?_____
Current driver's license: Operator's _____
Chauffeur's _____ Other _____
Number _____ State _____
Have you had any type of vehicle accident in the last three years?
Yes _____ No _____. _____

If yes, give dates and explain

Have you been convicted for a moving traffic violation in the last three years?
Yes _____ No _____. _____

If yes, give dates and explain

Has your driver's license been suspended or revoked during the last three years?
Yes _____ No _____.
To the best of my knowledge, the answers to the above are full and correct.
Date _____ Signature_____

REFERENCES

Do not use relatives. Include at least one businessman and one professional person.

	NAME	ADDRESS	TEL.	OCCUPATION
1.				
2.				
3.				
4.				
5.				

Appendix C

SCHOOL BUS DRIVER PHYSICAL EXAMINATION FORM

(Example of a form that may be used)

Name _____ Address _____

Have you ever had: 1. Heart trouble? _____ 2. Epilepsy? _____
3. Fainting spells? _____ 4. Diabetes? _____
5. Tuberculosis? _____
If "yes" to any of the above, explain: _____
_____
Signature of driver _____
Visual acuity* (if individual wears glasses, test and record acuity with and without glasses.)
Without glasses: R 20/_____ L 20/_____ B 20/_____
With glasses: R 20/_____ L 20/_____ B 20/_____
Field of vision _____ degrees Depth perception _____
Color perception _____ Muscular anomalies _____
Hearing without hearing aid: Right _____
Left _____
Heart sounds: At apex murmur _____ At base murmur _____
Rhythm _____ Enlargement indicated _____
Pulse: Rate _____ Regularity _____
Blood pressure: Systolic _____ Diastolic _____
Condition of arteries: Sclerosis _____ Pulsations _____
Lungs: Rales _____ Breath sounds _____ Chest X-ray _____
Weight _____ Height _____
Extremities: Deformities _____
Routine Office urinalysis _____
Evidence of infectious disease, mental disability, emotional instability, or drug addiction _____
_____
Remarks regarding any condition not within normal limits _____
_____
After examination I find _____
is / / is not / / free from any ailment, disease, or defect that might affect his or her ability to safely operate a school bus.
Date _____ _____
Licensed Physician

*Visual examination may be performed by either a licensed physician or a licensed optometrist.

Appendix D

INSTRUCTIONS FOR CONDUCTING EMERGENCY EXIT DRILLS

Due to the increased number of pupils being transported and the ever-increasing number of accidents on the highways there is a need to instruct pupils on how to properly vacate a school bus in case of an emergency. In an emergency it is possible for pupils to jam the emergency door by all trying to get out of the door at the same time. In order to help avoid a situation of this type, schools should organize and conduct emergency exit drills for all pupils who may ride the school buses.

There are several different drills:

1. Everyone exits through the front entrance door.

2. Everyone exits through the rear emergency door.

3. Front half exits through the front door and rear half exits through the rear door. (see diagram)

There is possible danger when a pupil jumps from the rear emergency door exit.

Reasons for actual emergency evacuations:

1. Fire or danger of fire. The bus should be stopped and evacuated immediately if the engine or any portion of the bus is on fire. Pupils should move to a safe place 100 feet or more from the bus and remain until the driver of the bus has determined that no danger exists. Being near an existing fire and unable to move the bus away, or near the presence of gasoline or other combustible material should be considered as "danger of fire," and pupils should be evacuated.

2. Unsafe position. In the event that a bus is stopped due to accident, mechanical failure, road conditions, or human failure the driver must determine immediately whether it is safer for pupils to remain in the bus or to evacuate.

3. The driver must evacuate if:

    a. The final stopping point is in the path of any train or adjacent to any railroad tracks.

    b. The stopping position of the bus may change and increase the danger. If, for example, a bus should come to rest near a body of water or precipice where it could still move and go into the water or over a cliff, it should be evacuated. The driver should be certain that the evacuation is carried out in a manner which affords maximum safety for the pupils.

    c. The stopping of the bus is such that there is danger of collision.

In normal traffic conditions, the bus should be visible for a distance of 300 feet or more. A position over a hill or around a curve where such visibility does not exist should be considered reason for evacuation.

Important factors pertaining to school bus evacuation drills:

1. Safety of pupils is of the utmost importance and must be considered first.

2. All drills should be supervised by the principal or by persons assigned to act in a supervisory capacity.

3. The bus driver is responsible for the safety of the pupils; however, in an emergency the driver might be incapacitated and would not be able to direct the pupil emergency evacuation. School patrol members, appointed pupils, or adult monitors should direct these drills. It is important to have regular substitutes available.

Pupil qualifications:

a. Maturity.

b. Good citizenship.

c. Live near end of bus line.

Pupil should know how to:

a. Turn off ignition switch.

b. Set emergency brake.

c. Summon help when and where needed.

d. Use fire axe or kick out windows.

e. Set flags and flares.

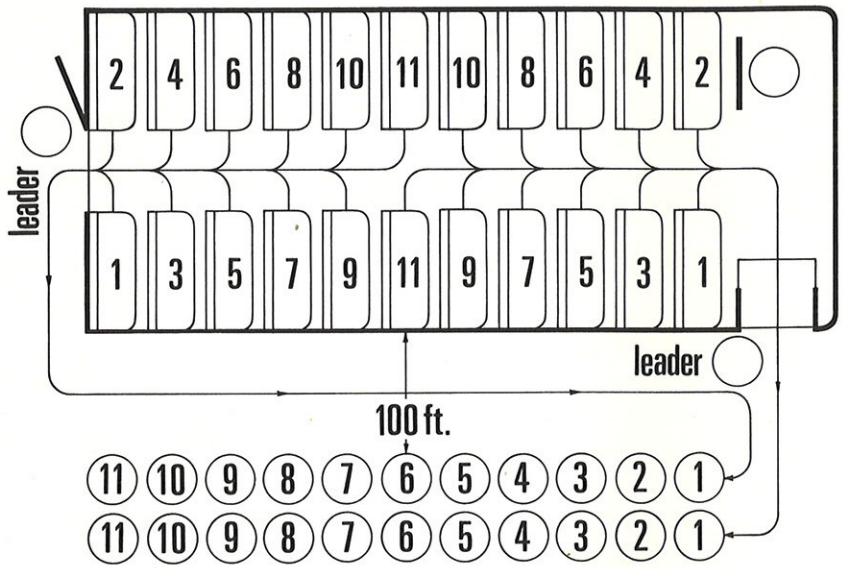
f. Open and close doors, account for all pupils passing his station.

g. Help small pupils off bus.

h. Perform other assignments.

66 PASSENGER BUS

(3 pupils to a seat)



66 passenger bus—11 rows of seats on each side
60 passenger bus—10 rows of seats on each side
54 passenger bus—9 rows of seats on each side
48 passenger bus—8 rows of seats on each side

4. Written consent from parent should be obtained before assigning a pupil as a leader.

5. School bus evacuation drills should be organized in a manner similar to fire drills held regularly in schools. The drills should be held more often during fall and spring months, preferably when bus arrives at the school building with the pupils.

6. Drills should be held on school property and not on bus route.

7. Types of bus drills held should be varied.

8. Drivers should stay in bus during evacuation drills. Be sure that the parking brake is set, ignition off, and transmission in gear.

9. Do not permit pupils to take lunch boxes, books, etc., with them when they leave the bus—getting the pupil off safely in the shortest time possible and in an orderly fashion is the objective.

10. The pupils should go to a distance of at least 100 feet from the bus in an "emergency drill" and remain there in a group until given further directions by the leader.

11. All pupils should be given an opportunity to participate, including those pupils who only ride a bus on special trips.

12. Each pupil should be instructed in the proper safety precautions while riding the bus and in drill procedures.

13. Instruct pupils in how and where to get help. Instructions and telephone numbers should be posted or otherwise carried in the school buses.

Appendix E

PLANNING SCHOOL SITES FOR SCHOOL BUS SAFETY

1. In the selection of school sites, major consideration should be given to the safety of pupils riding school buses. School buses will be forced to utilize the roads in and around the school site plus public highways leading into the school area. High density traffic flow near school exits and entrances due to the proximity of freeways, periodic commercial traffic, or massive commuter traffic from industrial plants should be avoided. It must be recognized in many cases that the area designated for the school site has been selected prior to the hiring of an architect. It is suggested, therefore, that this information be issued to boards of education and municipal planning authorities alerting them to the dangers inherent in the process of site selection. It is also suggested that boards of education discuss the selection with the superintendent of schools, traffic engineers, and the state office of School Plant Planning and solicit their help in evaluating possible school sites.

2. The location of the school plant on a site should be determined so as to provide safe means of entrance and egress for all pupils. When boards of education are considering school sites, the state, county, and local roads servicing the area should have a minimum 30 foot paved width where loading and unloading is contemplated off the main thoroughfare. If it is necessary to load or unload pupils on the main thoroughfare in front of the school, at least a 40-foot-wide paved road should be provided.

3. It is possible that boards of education may have land donated to them that could be classified as unsafe for busing due to its traffic density, type of terrain, or lack of safe loading and unloading facilities. The cost of eliminating these unsafe conditions may exceed the purchase price of a more desirable parcel of property. In such instances it might be wiser not to accept the donated land but attempt to secure a site that would provide for the safety of students that would have to be transported to the school.

4. All school bus traffic should be considered as one-way traffic flow, preferably with the service door side of the bus always next to the loading and unloading zone.

5. Wherever possible, separation should be maintained between bus traffic and regular flow as constituted by parent, pupil, service, teacher, and administrative traffic.

6. Whenever possible, roads should not be constructed that completely encircle a school. Areas that pupils must cross to engage in outside activities should be free of all vehicular traffic.

7. All school bus roads entering into or exiting from main arteries should have a 50- to 100-foot radius turn on inner edge of pavement. Within the school site, roads should have at least a 60-foot radius on

inner edge of pavement on all curves. At least a 50-foot tangent section should be provided between reverse curves. In order to minimize driveway entrance and exit widths, island construction may be required. Driveway openings must conform to local requirements, and in particular, driveway openings on state highways should be approved by the state highway department.

8. It is recommended that curbing, with suitable drainage, be constructed on all roads utilized by the school bus within the school site. A minimum of 30 feet should be maintained for one-way traffic and 36 feet for two-way traffic. Roads should be wider on all curves.

9. It is desirable to separate all parking from the loading zone utilized by the school bus.

10. In the construction of parking areas, it might be advantageous if only the visitor parking area were located in close proximity to the school. Care should be exercised in the placement of these areas to preclude the visitor from crossing the school bus traffic pattern.

11. Architects, prior to the designing and laying-out of roads and parking lots, should consult with the school administration on the following items:

    A. Total number of pupils and school personnel.

    B. Number of present and projected pupils to be transported.

    C. Number of buses.

    D. Type of schedule.

        a. Staggered.

        b. Single (one opening and closing time).

    E. Extra-curricular activities that would necessitate use of school buses.

12. Where buses are parked on the school grounds consideration should be given to the reflective surfaces of windows, doors, and windshields in order to prevent undue glare from these parked vehicles being transmitted to the pupils in the classroom.

13. Attention should be given in planning school bus parking and loading areas so as to encourage diagonal parking. Positioning of buses in slant formation provides the safest method of loading and leaving school grounds. Where this is not possible, bumper-to-bumper positioning of buses would be the next best solution. Either type of parking should exclude the necessity for backing the school bus.

14. In the construction of sidewalks for pupils walking to school,

consideration should be given to the elimination of crosswalks in front of buses.

15. In the analysis of many architects' plans for school buildings, bus canopies were included for consideration. In the majority of cases such units were not considered feasible for schools with large enrollments. Canopies are advantageous in schools where handicapped pupils are in attendance. Height of the canopy, obviously, should accommodate the highest school buses.

16. In the construction of curbs, where school buses will be utilized, consideration should be given to the performance specifications set forth by the state highway department.

17. In areas that will be constantly utilized by heavy-weight school buses, the type of pavement and base should be that specified by the state highway department.

18. All roads within the school site should be graded to avoid dips and hollows that would impair the vision of motorists using the roadways. It is suggested that a maximum standard of not more than a 5 per cent grade be allowed for roads on school sites. At entrance and exit points a maximum grade of 2 per cent should be adhered to.

19. Blind corners or intersections should be eliminated.

20. In the planning of a school and the location of access and service roads, conditions should never be set up that would require school buses to be backed on the school premises.

21. All pupil loading and unloading should be provided for on the school site.

22. Wherever possible, parents should be assigned a separate pupil pickup point some distance from the school bus loading areas. Accident-inducing conditions are created by parents picking up and discharging pupils haphazardly in the area in front of and adjacent to the building. The condition is greatly increased during inclement weather.

23. In the provision of loading facilities, consideration should be given to separate areas especially designed for handicapped pupils, including entrance ramps and handrails.

24. In the planning of all roads and loading areas, architects should take into consideration the fact that emergency vehicles must have access to the school at all times.

25. Care should be taken in the planting of trees and shrubbery on the school site so as not to obstruct the vision of the motorist.

26. Where necessary, traffic control devices should be provided to assist school traffic in entering the regular traffic flow.

Appendix F

EVALUATION CHECKLIST FOR SCHOOL BUS DRIVEWAYS IN THE VICINITY OF THE SCHOOL

NAME OF THE SCHOOL:_____ DATE: _____
LOCATION OF THE SCHOOL:_____

		YES	NO	DOES NOT APPLY
1.	School bus loading and unloading areas are provided on the school site.	____	____	_____
2.	When loading and unloading of school pupils take place on main thoroughfare in front of the school, the roadway has a minimum width of 40 feet of hard surface.	____	____	_____
3.	The driveway leading to and from the loading and unloading area for school buses has a minimum width of 30 feet of paved surface.	____	____	_____
4.	If diagonal parking is provided for buses in the loading and unloading area, a minimum width of 60 feet of paved surface is available.	____	____	_____
5.	Parking for loading and unloading of pupils at school is bumper-to-bumper ( ) or diagonal ( ): in either case, the necessity for backing does not exist.	____	____	_____
6.	The school bus is not required to back anywhere on school property.	____	____	_____
7.	All school bus movement on the school grounds is one-way in a counter-clockwise direction.	____	____	_____
8.	School bus traffic does not completely encircle the school building.	____	____	_____
9.	The driver has proper sight distance at all points along the driveway.	____	____	_____
10.	Crosswalks for pupils do not exist within the entrance to the school bus driveway.	____	____	_____

11.	Separation is maintained between school bus traffic and all other traffic.	____	____	_____
12.	Vehicular pickup points for non-bus pupils are on separate driveway from that used by school buses.	____	____	_____
13.	Curbing and suitable drainage are provided along driveways.	____	____	_____
14.	Curbing and driveway construction comply with state highway specifications.	____	____	_____
15.	At ingress and egress areas to the school there is a minimum radius on inner edge of driveway pavement of from 50 to 100 feet.	____	____	_____
16.	On the school site there is a minimum radius of inner edge of driveway pavement of 60 feet.	____	____	_____
17.	Between reverse curves, at least a 50-foot tangent section is provided.	____	____	_____
18.	At ingress and egress points a maximum grade of 2 per cent is adhered to.	____	____	_____
19.	A maximum grade of 5 per cent is adhered to on the school bus driveway within the school site.	____	____	_____

NOTE: A "yes" answer for each of the items indicates a well-planned traffic pattern for school buses.

SIGNATURES:
Person making the report:_____
Director of School Transportation:_____

NOTE: Most of the items included in this Evaluation Checklist are based on a 1966 Report of the Special Committee on School Plant Evaluation "School Planning: Safe Transporting". Bureau of Pupil Transportation, Department of Education, Trenton, New Jersey 08652.

APPENDIX G

RECOMMENDED PROCEDURES FOR SCHOOL BUS DRIVERS AT RAILROAD GRADE CROSSINGS

A. General

1. The driver of any school bus, with or without pupils shall come to a complete stop no closer than fifteen feet, and within fifty feet from the rails nearest the front of the bus.

2. Drivers making stops for railroad crossings shall observe traffic. Bus speed shall be reduced far enough in advance of the stop to avoid trapping other motorists in panic stops or rear-end collisions with the bus. On multiple lane roadways, all stops must be made in the far right lane whenever possible.

3. Turn signal lights shall be operated in their hazard mode when permitted by state statute or regulation. No other signs or signals will be activated from the bus while stopped or stopping for the railroad crossing.

4. When the bus is stopped, the driver shall fully open the service door, listen and look in both directions along the track or tracks for approaching engines, trains, or train cars.

5. For improved vision and hearing, a window at the driver's left should be opened and all noisy equipment (fans, etc.) should be turned off until the bus has cleared the crossing.

6. If the view of the track or tracks is obstructed for one thousand feet in either direction, no portion of the bus may be driven onto the tracks until the driver has made certain that no train is approaching. Although railroad signals may indicate the tracks are clear, the driver must develop and use visual and audible senses to determine whether or not it is safe to proceed.

7. The school bus driver shall always drive across the tracks in an appropriate low gear and will not change gears while crossing the tracks.

8. After a train has passed the crossing, the bus driver shall not drive the bus onto any tracks until the driver is certain that no train, hidden by the first train, is approaching on an adjacent track. Familiarity with train time schedules has no place in school bus operation.

B. At Crossings Controlled by Signals

1. The driver of a school bus which has stopped at any railroad track or tracks at which there is in operation any flashing red lights and/or bell shall not proceed across such track or tracks

unless by authorization from a law enforcement officer or flagman.

2. At crossings controlled by traffic signals (usually on freeways), the bus driver shall obey the traffic signals.

C. At Crossings Controlled by Crossing Gate or Barrier

1. No bus driver shall drive the bus through, around or under any crossing gate or barrier at a railroad crossing while such gate or barrier is closed or being opened or closed.

2. The bus driver must never accept a lack of movement as an indication that the device is working or out of order. A driver must always consider a railroad grade crossing as conclusive warning of danger and shall not cross the tracks until the driver has determined that no train is approaching.

D. Weather Conditions

During wet, stormy, or foggy weather, before placing part of the bus on the tracks, the driver must know that the crossing can be made in safety. Any use of flares or warning signals must be taken as an additional warning of danger.

E. Behavior of Pupils

When any school bus must stop for any railroad track at grade, all pupils must be silent until crossing is completed. Such signal for silence shall be given by the school bus driver.

Adapted from Fleet Safety Memo No. 58, Motor Transportation Department, National Safety Council, Chicago, Illinois 60611.

Appendix H

NEEDS ASSESSMENT OVERVIEW

A. WHAT IS COMPREHENSIVE PLANNING?

A comprehensive planning process is a systematic procedure for answering the following questions: Where have we been? Where are we now? Where are we going? How are we going to get there? How will we know when we get there? How will we monitor the process? The result of a comprehensive planning process will be the design and implementation and evaluation of programs tailored to fulfill the identified needs and achieve the district's educational goals.

B. GENERAL STEPS IN A PLANNING PROCESS

COMMITMENT TO BEGIN SYSTEMATIC PLANNING

This procedure is usually initiated by one or more staff members or an administrator who introduces the idea to the district. The School Board must then either formally reject or accept the idea of adopting a comprehensive planning process.

GOAL DEVELOPMENT

This step defines "What should be" in broad, timeless terms. Goals should express the general desired outcomes of the planning process. Many models consider it desirable that goal determination precede needs assessment so that the goals are not just problem-oriented. Other models stress frequent revision of both goals and needs because of their close interrelatedness.

NEEDS ASSESSMENT

This stage entails the specification of the discrepancy between "What is" and "what should be." This gap, or need, should always be related to the learner. All other needs, such as the institutional ones, should ultimately be related to these learner needs. Often this stage also includes an assignment of priorities to the needs. Some models place needs assessment before goal development on the premise that assessing "what is" first leads to more realistic identification of "what should be."

PROBLEM ANALYSIS

This stage examines the reasons for the discrepancy between goals and needs, identifying the elements of the problem, their causal relationship, the relative impact of each, and the degree to which each can be altered.

GENERATION OF ALTERNATIVES

From this examination of the problem starts the development of various alternative solutions. These alternative methods are analyzed in terms of effectiveness (quality), cost, time, consequences on other goals, impact (quantity), political feasibility and other side effects.

SELECTION OF ALTERNATIVE

Based upon the analysis of the various alternatives in the preceding step, one of the alternatives is chosen for implementation. In this stage, the decision-makers can include the same group involved in earlier stages or a person or group not previously involved in the process.

IMPLEMENTATION

At this point, the selected program is developed into a plan of operation and carried out by the administrative mechanism. Persons who planned the program may or may not be involved in its implementation. In either case, the program design should provide for feedback to the implementors in order to give an on-going measure of how well the program is meeting the goals and objectives.

EVALUATIONS

This step examines the success of implemented programs in achieving the established goals and objectives. Feedback from this stage provides the basis for modifying all steps of the process in order to improve attainment of the goals. In some models, evaluation is the first step in the process instead of the last, defining "what has been," before proceeding to "what should be."

RECYCLE

The entire process is repeated since, in a rapidly changing society, goals and needs must be continually redefined to reflect new conditions and new priorities.

C. WHY DO COMPREHENSIVE PLANNING?

In comprehensive planning, each step provides a solid base for the following step. The first steps, goal development and needs assessment, are pointers: they provide a clear statement of where a district wants to go. They, in turn, lead into detailed analysis of the problems related to specific identified needs. The problem analysis provides knowledge of important facts and casual relationships necessary for finding the most effective solution. Problem analysis is followed by the next steps: generation of alternative solutions and selection of the most appropriate one for the situation. The comprehensive approach tries to insure that the solution will fulfill, partially or completely, the stated goals of the system. Evaluation takes place throughout the process, not just during the implementation stage.

Based on the results of the evaluation, goals can be redefined and the assessment of needs can be modified. This evaluative feedback enables the planners to make necessary corrections, adjusting the plan as they proceed. Comprehensive planning does not provide all the answers but it does provide for continual appraisal of the system's efforts to meet the needs of its pupils.

The comprehensive planning process is a systems approach. It recognizes the interrelationships that exist among the elements of the whole educational system and the fact that any change in one part can have an important effect on the rest of the parts. Comprehensive planning provides decision makers with better information which, in turn, facilitates better administration of a system's present and future operations.

Through comprehensive planning, questions that are fundamental to the existence and function of the school can be answered. Each system should ask itself:

a. Why are we here (philosophy of the system)

b. Where are we now? (assessment of present situation)

c. Where do we want to go? (goals of the system)

d. How are we going to get there? (alternative solutions)

e. How will we know we got there? (evaluation)

These questions are the basis for a comprehensive planning process. They provide a system with an organized, thorough and informative self-evaluation.

A comprehensive plan, through this logical sequence of steps, provides the Board of Education and the community with an explanation of where their money is going, what it is expected to accomplish, how long it will take, and how well it is succeeding. Furthermore, when conducted for more than one planning cycle, comprehensive planning provides an excellent way of building on past experience. This continuity proves especially valuable in transition periods caused by changes in leadership.

Most important, the institution of a comprehensive planning process helps a school system provide quality education for all its students. The implementation of programs and solutions is not dependent only on current crises but rather based on a complete analysis of goals, needs and problems.

RESOLUTIONS

BE IT RESOLVED THAT THE DELEGATES OF THE NINTH NATIONAL CONFERENCE ON SCHOOL TRANSPORTATION:

1. Express appreciation to the National Association State Directors of Pupil Transportation Services, National Association for Pupil Transportation, National School Transportation Association, Vehicle Equipment Safety Commission, School Transportation Section—National Safety Council, The School Bus Manufacturers Institute, and Central Missouri State University for sponsoring this national conference.

2. Commends Dr. Robert L. Marshall, Dr. Robert L. Baldwin, associates and staff at Central Missouri State University and Mr. William G. Loshbough, General Conference Chairperson for the excellent manner in which the conference itself was organized and the excellent manner in which delegates, needs for food, shelter, and hospitality were met.

3. Express appreciation to the National Safety Council for publishing and marketing the proceedings of the Ninth National Conference on School Transportation.

4. Express appreciation to Dr. Norman Key for his past contributions to pupil transportation and his continued interest and concern for the safe transportation of our nation's school children.

5. Pledge to serve as resource persons within their respective states to accelerate implementation of improved pupil transportation programs based upon the conference proceedings.

6. Encourage the appropriate state agencies to continue to provide active support and assistance to school systems in improving pupil transportation programs.

7. Urge the sponsoring organizations to continue their efforts to encourage professional personnel working in areas within or allied with pupil transportation to participate in future national conferences.

8. Encourage appropriate state agencies and school systems to continue to develop and improve operational procedures for energy efficiency.

9. Grant to the conference editing committee the editorial prerogative needed to prepare the official conference proceedings. The conference Steering Committee shall provide oversight during the editing process.

10. Urge college and university book stores, state departments of education, other appropriate state agencies, professional associations, libraries and school systems to purchase copies of the

proceedings of the Ninth National Conference on School Transportation for resale, distribution, circulation and use.

11. Request school bus chassis manufacturers to make available brake lines constructed of improved corrosion-resistant material.

12. Urge school bus chassis manufacturers to solicit user evaluation prior to making design changes on such items as clutch, brake, accelerator, and other driver controls.

13. Urge school bus chassis manufacturers to design and manufacture the chassis for Type B, Type C, and Type D school buses that will not produce outside noise emissions in excess of an 83dbA level as measured in accordance with the procedures prescribed in 40CFR, Chapter I, Part 205, Section 205.54-1,2; and further, urge the United States Environmental Protection Agency to incorporate school bus noise regulation into the above referenced standard in lieu of promulgating a separate noise standard for school buses, provided EPA determines that regulation is needed.

14. Encourage manufacturers of pupil transportation equipment to participate as technical advisors in future national conferences but prohibit their participation as voting delegates.

15. Express appreciation to, and encourage the United States Congress to continue to support or increase support for school bus driver training through the funding established in Section I, 406 of Title 23, USC.

16. Urge the United States Congress to require of federal agencies promulgating rules and regulations relating to school buses, to document the need for such rule-making through an appropriate research effort as well as determining the safety and cost benefit of the proposed rules.

17. Urge the National Highway Safety Administration to adopt more flexible regulations regarding emergency exits in general and rear emergency doors in particular on school buses for transportation of the handicapped in order to facilitate the special emergency evacuation needs of these passengers.

18. Urge the National Highway Traffic Safety Administration to construct a prototype school bus to meet proposed Federal Motor Vehicle Safety Standards 111 and 128 for display and evaluation by the sponsors of the Ninth National Conference on School Transportation prior to taking further rule-making action on these proposed rules.

19. Urge the National Highway Traffic Safety Administration to continue to conduct research on current school bus seat spacing, and if appropriate, revise requirements to provide as much spacing between seats as possible without compromising the safety of the pupils.

20. Request the National Highway Traffic Safety Administration to amend Federal Motor Vehicle Safety Standards 212, 217, and 219 to permit school bus body and chassis manufacturers to mount school bus windshields in such a manner so as to permit the removal without the use of tools, and thus to allow the windshield to become a means of pupil egress in event of an emergency.

21. Urge the National Highway Traffic Safety Administration to provide relief from the excessive cost burden and reduced safety benefit by amending Federal Motor Vehicle Safety Standard 222 regarding impact and contact surface performance requirements that will provide adequate levels of pupil protection and reduce the current excessive maintenance problems.

22. Urge state legislatures and appropriate state agencies to enact laws, or promulgate rules and regulations and enforce same, precluding non-public schools or other agencies from licensing vehicles as school buses unless those vehicles meet state and federal school bus construction standards.

23. Encourage appropriate state agencies to include as a minimum or to retain as a minimum at least a twelve (12) inch aisle to the emergency door on Type B, Type C, or Type D school buses having only one emergency door.

24. Encourage and support appropriate activities which will conserve energy, non-renewable and natural resources, in the daily and long term operation of school transportation programs. Further, we recognize that lowest-priced equipment and components available may not be the most cost-effective and/or fuel-efficient, and therefore urge that future decisions related to school bus specifications and purchases be based on life cycle costing procedures which include the consideration of the initial purchase price, all maintenance and operational costs including labor, fuel, oil, and parts required to operate the bus over its entire life, and further, encourage that in future conferences, operating procedures, (including proper driver practices, routing and scheduling) be adopted that are the most fuel-efficient without sacrificing pupil safety.

BE IT FURTHER RESOLVED THAT THE SPONSORING ORGANIZATIONS (NASDPTS, NAPT, NSTA, VESC, NSC, SBMI, AND CMSU):

1. Review the progress being made toward realization of the goals established for pupil transportation by the Ninth National Conference on School Transportation and prepare for future conferences as needed.

2. Submit to the National Highway Traffic Safety Administration a request for establishing new color tolerances for paint standard 595A (National School Bus Yellow 1980) and encourage paint

manufacturers to produce and make available, as soon as possible, the necessary paints for school bus manufacturer and state usage.

3. Plan a session at the 1981 NAPT/NASDPTS and NSTA conferences to review and update as appropriate the proceedings of the Ninth National Conference on School Transportation as it relates to minimum standards for the special education school bus and auxiliary equipment.

4. Consider in their planning for future national conferences the inclusion of a writing committee for the purpose of developing minimum standards for Type A and Type B school buses.

5. Provide copies of these resolutions to school bus body and chassis manufacturers, National Highway Traffic Safety Administration, Environmental Protection Agency, and other agencies, organizations, and individuals deemed appropriate.

6. Initiate the development of minimum standards as it relates to the use of alternative fuels for school bus application.

7. Provide to the pupil transportation industry via newsletters, professional journals, etc., status reports as to the publishing and availability of the proceedings of the Ninth National Conference on School Transportation.

9th National Conference on School Transportation

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Minimum Standards for School Bus Operations

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OLC—On Location Chairperson
SP—Special Conference Guest
GCC—General Conference Chairperson
WCC—Writing Committee Chairperson
CP—Conference Parliamentarian
WC—Writing Committee

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