

PLANNING FOR SCHOOL BUS SAFETY ON SCHOOL SITES AND SCHOOL BUS PARKING LOTS

School Site Student Loading & Unloading & School Bus Parking Lot

1. In the selection of school sites and location of school bus parking lots, major consideration must be given to the safety of pupils riding school buses both on campus and on the adjacent roads surrounding the school site. School buses must be able to use the roads in and around the school site, and therefore the public highways and intersections leading to and from the school must be adequately designed to accommodate buses. High-density traffic flow near school bus drives that are due to the proximity of freeways, periodic commercial traffic, or massive commuter traffic from industrial plants and other large employers should be avoided. It is required that the school board and district staff solicit the help of the South Carolina Department of Transportation (SCDOT) Traffic Engineering Division, and the South Carolina Department of Education's Office of School Facilities and the Office of Transportation in evaluating and selecting possible sites.

School Site Student Loading & Unloading

2. The location of the student occupied building on a site should be determined to provide a safe means of access to the area, and ingress and egress for all pupils to the site. When the school district is considering a school site, the state, county, and local roads servicing the area should be of adequate width to safely accommodate school buses. Pupil loading or unloading on school buses and private vehicles must always occur on the school site, at least fifty feet away from an access highway.

School Site Student Loading & Unloading

3. All on-site school bus loop traffic should be a one-way traffic flow, with the service door side (right side) of the bus always next to the school's loading and unloading zone.

School Bus Parking Lot

4. The design of the school bus parking facility must recognize that the facility is not only to park school buses but also to service the school buses in the space that the bus is parked. The servicing includes fueling (which will likely occur every day at some part of the parking lot), school bus inspection and school bus repair. These services (fueling and lubrication) and repairs (tire changes and minor component repair or replacement) require technicians to work on the front and/or rear of the school buses; this requires service vehicles (service trucks, lubrication vehicles and 1,600 gallon fuel tanker trucks) to be parked at the front and rear of the school bus (sometimes at the same time). There also may be a need to use a wrecker to move a bus out of the park area; the wreckers must be able to access the parked school bus from the front or rear.

School Bus Parking Lot

5. The design of school bus parking lots must allow for the parking and servicing/repair of school buses (state owned route buses, state owned spare buses, district owned school buses), the parking of school bus driver private vehicles (at least 1 private vehicle for each school bus parked), the parking of administrative vehicles, the parking of cars for visitors and the construction of a school transportation building to train and dispatch the drivers and provide office space for the administrative/supervisory/training/routing staff. In some situations, based on the needs of the district, the parking facility may also include a maintenance garage and a fueling station.

School Site Student Loading & Unloading & School Bus Parking Lot

6. The design of roadway access to the school site and school bus parking lot must comply with SCDOT requirements.

School Site Student Loading & Unloading

7. School bus loading and unloading should be separated from the traffic flow associated with student, parent/visitor, teacher and administrative parking and service delivery. Vehicular traffic (students, parent/visitors, teachers and administrative traffic and service delivery), other than school buses, should never be allowed to operate near where school buses are loading or unloading. The traffic flow on a school campus should never be designed or constructed to allow non-school bus vehicle to pass or load adjacent to a school bus that is in the school's loading/unloading zone.

School Site Student Loading & Unloading & School Bus Parking Lot

8. Student and parent/visitor parking areas should be separated from each other and separated from bus loops, bus parking areas and service deliveries.

School Site Student Loading & Unloading

9. Whenever possible, the school buildings used by students should not be situated on the site so that they are completely encircled by roads or traffic movement. Areas that pupils must cross to engage in activities outside the buildings should be free of all vehicular traffic and parking areas.

School Site Student Loading & Unloading & School Bus Parking Lot

10. All school bus drives entering into or exiting from main highways should have a minimum 40-foot radius turn on the inner edge of pavement. Within the school site, roads should have at least a 40-foot radius on inner edge of pavement on all curves. At least a 100-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 state and local requirements. The S.C. Department of Transportation must approve driveway openings on all roadways.

School Site Student Loading & Unloading & School Bus Parking Lot

11. Mountable curbing, with suitable drainage, should be constructed on all roads utilized by school buses within the school site. Mountable curbing is necessary to avoid damage to school bus tire sidewalls created by regular curbing. Consideration should be given to Department of Transportation performance specifications. The S.C. Department of Transportation shall determine the minimum road width for one-way loop traffic and for two-way traffic. Pavement width may need to be wider in curves.

School Site Student Loading & Unloading & School Bus Parking Lot

12. If a school bus parking facility is located on a school campus, the parking lot should provide adequate parking spaces for the school bus fleet that is required to serve the students assigned to the school. All school bus parking areas shall have a designated parking location approved by the South Carolina Department of Education's Office of Transportation.

School Site Student Loading & Unloading

13. Care should be exercised in the placement of all non-school bus parking locations to eliminate pedestrians crossing the school bus traffic pattern and parking area to access school buildings and facilities.

School Site Student Loading & Unloading & School Bus Parking Lot

14. Prior to designing and laying out roads and parking lots, architects should be knowledgeable of the following items:
 - a. Total number of pupils and school personnel assigned to the school
 - b. Number of present and projected pupils to be transported by school bus
 - c. Number of present and projected buses needed to serve assigned students
 - d. Number of present and projected buses to be parked at this location (state and district owned).
 - f. Type of school schedule
 - (1) Staggered opening and closing times
 - (2) Single opening and closing times
 - g. Extra-curricular activities that would necessitate use of school buses, increase the number of school buses parked at the school and the additional guest parking that these activities will create.
 - h. Any special facilities or services that will be a part of the parking facility (offices, garage bays and fueling stations).

School Site Student Loading & Unloading & School Bus Parking Lot

15. When school bus parking is located on school grounds it is desirable to orient the buses in the parking lot to prevent glare from the buses' reflective surfaces of windows, doors, and windshields from being transmitted to the pupils in the classroom.

School Site Student Loading & Unloading & School Bus Parking Lot

16. Attention should be given in planning school bus parking, loading, and unloading areas to assure that backing a school bus will never occur and students are never permitted to walk between or behind school buses during loading or unloading, and while they are parked. Backing of buses in existing parking facilities should be avoided.

School Site Student Loading & Unloading

17. Sidewalk access to the school site and on the school site should be designed to eliminate student crosswalks in front of the buses loading and unloading areas.

School Site Student Loading & Unloading

18. Plans for school construction may include student canopies at school bus loading and unloading areas. Canopies are considered especially advantageous for loading and unloading students with physical disabilities and especially for students in wheelchairs. The height of the canopy must accommodate a school bus at least 128 inches high. Each canopy support post adjacent to the driveway curb should have a three-foot minimum setback from the curb to minimize the possibility of crushing a pupil between the support post and an arriving school bus. The location of supports for the canopies and other structures must not restrict the operation of school bus wheelchair lifts used for loading and unloading students with disabilities.

School Site Student Loading & Unloading & School Bus Parking Lot

19. For drive and parking areas that will be utilized by school buses, the type of pavement and base should conform to S.C. Department of Education's Office of Transportation specifications.

**SCDE RECOMMENDED MINIMUM PREPARATION AND SURFACE PAVING
SPECIFICATIONS FOR SCHOOL BUS PARKING AREAS**

MINIMUM FLEXIBLE PAVEMENT THICKNESS RECOMMENDATIONS			
VEHICLE TYPE	LAYERS	MATERIAL	THICKNESS (INCHES)
SCHOOL BUS TYPE VEHICLE	A	ASPHALTIC CONCRETE SURFACE COURSE	2.5
	B	ASPHALTIC CONCRETE BINDER COURSE	2.5
	C	GRADED AGGREGATE (STONE) BASE COURSE	8
	D	PROPERLY PREPARED SUBGRADE	12

**SCDE RECOMMENDED MINIMUM PREPARATION AND SURFACE PAVING
SPECIFICATIONS FOR SCHOOL BUS PARKING AREAS**

MINIMUM RIGID PAVEMENT THICKNESS RECOMMENDATIONS			
VEHICLE TYPE	LAYERS	MATERIAL	THICKNESS (INCHES)
SCHOOL BUS TYPE VEHICLE	A	PORTLAND CEMENT CONCRETE	6
	B	GRADED AGGREGATE (STONE) BASE COURSE	6
	C	PROPERLY PREPARED SUBGRADE	12

School Site Student Loading & Unloading & School Bus Parking Lot

20. All school bus parking areas must be in compliance with SBE Regulation 43-80-L

The school district shall provide for safe loading and unloading of students and a suitable concrete or asphalt-paved area for the parking and servicing of buses during the school hours. The parking and service area shall be located and designed to insure that vehicular traffic, students, or unauthorized personnel are not in or around parked buses during the school day and shall be in compliance with all safety and fire regulations.

School Bus Parking Lot

21. The school bus parking area must be designed to park buses side-by-side; end-to-end parking is not allowed in new or re-designed facilities. The side-by-side parking should be allow for easy entrance and exit by a large school bus (15 X 40 feet) using parking spaces that are aligned at about an 135 degree angle to the traffic lane.

School Bus Parking Lot

a. The school bus parking stall for each bus must be 15 X 40 feet for a regular route school bus and 18 X 40 feet for a school bus that has a wheelchair lift.

School Site Student Loading & Unloading & School Bus Parking Lot

b. All roads within the school site should be graded to avoid configurations that could impair a motorist's vision. It is suggested that a maximum 5% grade be allowed on all roads and, at entrance and exit points a maximum 2% grade be allowed. School bus parking areas must be a maximum of 1% grade.

School Site Student Loading & Unloading & School Bus Parking Lot

24. Should the school bus parking area have a slope greater than 1%, the bus parking design must have the parked bus's fuel intake on the up-hill side of the bus.

School Bus Parking Lot

25. Private vehicles, vehicles owned by the bus drivers, must be parked separate from the area used to service the SCDE school buses. The access for private vehicle parking areas must not pass though the school bus parking area (between the buses or within 15 feet of the parked buses).

School Bus Parking Lot

26. The driveways/travelways in a bus parking area may only be used by official school transportation vehicles (buses and bus service equipment). Vehicles not associated with the student transportation program must be excluded from these driveways. See attached State Fire Marshal fueling requirements.

School Bus Parking Lot

27. District-owned vehicles, including school buses, must not be parked among the state-owned school buses, unless these buses are under contract with the SCDE to receive service/maintenance.

School Bus Parking Lot

28. The school bus parking lot must be designed, to allow the grouping of four or more buses, this grouping allows the state-owned buses receiving fuel on the same day to be parked next to each other and fueling to be provided efficiently.

School Site Student Loading & Unloading & School Bus Parking Lot

29. Blind corners and intersections must be eliminated. Trees and shrubbery planted on the school site must not obstruct a motorist's or pedestrian's vision.

School Site Student Loading & Unloading

30. Loading and unloading facilities serving students with disabilities may require access ramps and handrails.

School Site Student Loading & Unloading & School Bus Parking Lot

31. Plans for roads and loading areas should accommodate emergency vehicles which must have access to the school or parked vehicles at all times.

School Site Student Loading & Unloading & School Bus Parking Lot

32. Where necessary, traffic control devices should be provided to assist school traffic to enter and exit the traffic flow on access highways.

School Bus Parking Lot

33. The school bus parking lot must comply with the following to avoid school bus damage reimbursement for buses damaged while parked due to vandalism.
- Security must be equal to or better than that available at the SCDE bus shop.
 - The circumferential fencing equivalent is measured in type (strength) and height (shop minimum 6'5") and the fence must have a top security layer (3 strand barbwire).
 - Access gate equivalent is measured in type (strength) and height (shop minimum 6').
 - Gate lock equivalent is measured in type (strength) and security.
 - Lighting equivalent is measured in level of illumination (minimum set by local shop).

Proper Disbursement by Fuel Vehicles for School Buses

The **2009 International Fire Code (IFC)** and the **2007 National Fire Protection Association (NFPA) Standard No. 30A** establishes codes and standards for fire protection. The Office of State Fire Marshal's has adopted these codes, and by reference through the IFC has adopted the 2007 NFPA 385.

NFPA 385 Standard for Tank Vehicles for Flammable and Combustible Liquids is the standard that includes requirements for the unloading of tank vehicles. Per (2007) NFPA 385 section 9.2.1, loading and unloading of tank vehicles shall only be done in "approved locations".

At a meeting on May 24, 2006 with the State Fire Marshal, Michael Platt, the proper disbursement of fuel by a fuel vehicle (fuel tanker) to South Carolina public school buses was discussed. At this meeting representing the State Department of Education was Donald Tudor, CDPT, Director, Office of Transportation, Marshal Casey, Assistant Director Maintenance and Training, Office of Transportation, Alex James, AIA, Director, Office of School Facilities, and Steven Jenkins, PE, CBO, of the Office of School Facilities. In this meeting it was decided that NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages would be used as a basis for determining what an "approved location" would be.

Adopted and referenced standards establish the following:

1. Loading and unloading of tank vehicles shall be done only in approved locations [based on (2007) NFPA 385 section 9.2.1].
2. Mobile fueling shall not take place within 15 feet of buildings, property lines, combustible storage or storm drains [based on (2009) IFC 3406.5.4.5 (6.)].

Per the above "approved location" decision for school facilities, the following also apply (Standard editions and section numbers have been changed to reflect those in effect for 2011):

1. No part of the tank vehicle should be within 50 feet of an important building (i.e. any occupied school building) [based on (2008) NFPA 30A Table 4.3.2.4].
2. The dispensing devices (*fuel nozzle*) shall be 10 or more feet from the property lines [based on (2008) NFPA 30A 6.2.1(1)].
4. The nozzle, when the hose is fully extended, will not reach within 5 feet of building openings (*any part of the building*) [based on (2008) NFPA 30A 6.2.1(4)].

Consequently, a fuel vehicle with a 50 foot hose shall be no closer than 55 feet to the school building or 60 feet from the property line (see above 6.2.1 (1)).

5. Mobile fueling shall not take place within 15 feet of buildings, property lines, combustible storage or storm drains [based on (2009) IFC 3406.5.4.5 (6.)].

6. Motor vehicle traffic patterns at motor fuel dispensing facilities (*or fuel vehicle*) shall be designed to inhibit movement of vehicles that are not being fueled from passing through the dispensing area [based on (2008) NFPA 30A 6.3.7].

When a secure area is not provided, barriers shall be provided to prevent vehicular or pedestrian movement within 10 feet of the fueling area. The barrier shall state that fueling is taking place. The barrier may be a portable cone.