

Published February 2010



Public Schools of North Carolina State Board of Education Department of Public Instruction

Division of School Support • School Planning 301 N. Wilmington St. Raleigh, NC 27601-2825 www.schoolclearinghouse.org

Forword

The selection and planning of sites appropriate for school facilities is a critical and complex undertaking. School facilities are varied and intricate and must be conveniently and safely adaptable for use by many school and community activities.

This publication states many factors that must be recognized during the process of site selection, planning, development and use. Some of these factors are the result of increased concern for environmental conservation and management; others result from the demands put on facilities by the many educational and recreational activities of entire communities.

School Planning has consistently encouraged improvements in the planning and care of school grounds. With the assistance of appropriate consultants and resource agencies, many of which are listed in this publication, school officials can provide communities and schools with adequate sites.

William C. Harrison, Ed. D., Chairman North Carolina State Board of Education June St. Clair Atkinson, Ed.D., State Superintendent North Carolina Department of Public Instruction

In compliance with federal law, including the provisions of Title IX of the Education Amendments of 1972, NC Public Schools administers all state-operated educational. Programs, employment activities and admissions without discrimination because of race, religion, national or ethnic origin, color, age, military service, disability, or gender, except where exemption is appropriate and allowed by law.

Acknowledgements

The Department of Public Instruction gratefully acknowledges the contributions of the following, without which the development and updating of this publication would have been difficult.

- Staff of the School Planning Section; DPI: Steve Taynton, AIA; Greg Flynn, NCARB; Ken Phelps, AIA; Pam Ray; Roger Ballard, R.A., Primary Author
- Chris Hilt and Alice Reese; CLH Design, P.A. / Landscape Architects and Civil Engineers, Cary, NC

Table of Contents

Introduction	1
The School Site: Land for Learning	2
Knowing The Community or Territory	
Knowing The Local School System	
Replacement or Abandonment of Older Buildings	
Site Selection Process	9
Selecting A School Site	
Technical Requirements	
Size; Shape; Location; Topography and Drainage;	12
Access and Traffic; Security and Safety;	
Soil Conditions and Plant Life; Noise Levels; Utilities; Costs	
Worksheet for Prioritizing Sites	20
Worksheet for Phontizing Sites	20
Site Planning Process	21
Elementary School Site Design Diagram	
Middle School Site Design Diagram	
High School Site Design Diagram	
Developing The School Site	
Components of a School Site	
Buildings and Landscaping; Buses; Private Vehicles; Service Vehicles;	
Pedestrians; Utilities; Playgrounds	
Playgrounds	37
Planning A Playground	
Play Area K-2	
1.a, 7.1.0a 1. =	
Transportation	46
Recreation and Athletic Fields	5 1
NEGICALION AND ALMENC FIGUS	54
State Agencies and Statutes	55
Resource Agencies and Professions	
N.C. Statutes Relating to School Sites	
Peferences	6′

Introduction

The School Site: Land for Learning

The school site is the property and physical location often referred to as the school. It is linked to other places in the community by transportation and communication. In many communities, school facilities are frequently used for purposes other than those directly related to the learning activities of students; such as adult education, public assembly, recreation, election polling places, meetings that require food services, etc. There is a trend toward increasing this multi-use function of school facilities. Some schools are now being built as a part of a larger complex of community service facilities: recreation grounds and parks, health and social services centers, libraries and cultural centers. {See the School Planning publication "Community Schools in North Carolina" September, 2008}

Current trends in school design such as the "Smart Growth" movement and "Healthy Schools" emphasize:

- Integrating school planners, local planning and zoning departments, transportation (vehicular and pedestrian), public works and parks departments in the planning process for school siting to create an integrated and cooperative process.
- Looking for opportunities to create "commonly-centered" schools with shared facilities that operate year around (community centers, libraries, athletic programs, adult education, day care, etc.)
- Creating healthy students while increasing air quality by reducing transportation and roadway infrastructure costs by creating walkable schools that are connected to the community through bikeways, greenways and safe networks of streets, sidewalks and road crossings. (See Safe Routes to Schools Program).
- Evaluating infill (sites within existing densely populated areas) where existing street networks and infrastructure can significantly reduce the cost of site development.

No school system ever completely or permanently solves all of the problems relating to school sites. Even if it does not need to buy new land, the school system needs to operate and maintain existing sites. It is very likely that all school grounds continually need to be replanned, renewed or otherwise improved to meet changing requirements.

In an area where population and educational changes are taking place, finding and developing new sites may be a continuing process. Even in small, stable communities there is a constant need to improve and upgrade school programs and facilities. This may require abandoning or preferably repurposing obsolete schools and relocating them on new land or acquiring additional land at an existing school site.

School officials, patrons, parents and students are becoming more concerned about improving the sites and grounds for public schools. In addition, increasing emphasis on conserving, preserving and restoring our physical environment has led to actions such as these:

- greater control over the soil sedimentation that results from construction projects and poor soil management practices.
- higher standards for water quality and for disposal of waste material
- efforts to minimize damage to humans that can result from air pollution and noise pollution
- energy conservation measures.

Furthermore, official steps are being taken to provide more agreeable accommodations in the man-made environment. Some examples are:

- legislation that requires higher standards for safety of employees in commerce and industry that also affects school-owned facilities.
- more stringent building codes to provide for physically disabled persons' access to public facilities.

Knowing the Community or Territory

Selecting, planning and developing school sites should be an organized and rational process that is based on adequate and accurate information. Information should include facts about the community or territory and data about schools under the responsibility of the local administrative unit.

The local administrative unit is directly responsible for the school services that are provided by their public schools. These school services not only pertain to the educational benefits provided to the students, but also on how the public schools interact with the community and other agencies such as parks and recreation, health and social services, entertainment, cultural arts and adult education.

School officials should maintain adequate and current information on their local administrative unit's community or territory regarding the following areas:

Geographical:

Should include a set of maps and other forms of data that describe the boundaries of the county and administrative units. These maps should include major roads, utilities, land ownerships, hospitals, industries, cultural centers, parks, etc. Sources of GIS Information?

Sociological:

Should include information about the general characteristics of all inhabitants of the administrative unit. such as community history, ethnic origin, educational levels. economic status. employment, cultural opportunities. population, crime patterns, population projections (growth), religious bodies. institutions and educational services.



Cultural Arts:

Cultural services and activities in the community can affect and influence public education and can be a rich resource for educational purposes such as museums, concert halls. galleries, music. artists and performers in visual arts, film, etc.

Recreational:

Since public schools will increasingly interact with and provide some of the recreational services to the community, school officials must be aware of the recreational agencies, services and places used by the citizens.

4

Educational:

The public school system is not the only educational agency in the community. Public schools are affected by non-public schools in terms of enrollments, public attitudes and support. School officials should know about all local institutions of education.

Financial Base:

Schools need money. School officials must know about the availability and use of tax funds and other financial resources for educational purposes. Information should be gathered about the characteristics of industrial and commercial enterprises and their development programs, as well as local transportation and communication services.

Knowing the Local School System

Each school within an administrative unit is an institution by itself serving one or more communities. There can be more than one educational institution serving different age groups within a community, such as elementary schools (grades K-5), middle schools (grades 6-8) and high schools (grades 9-12). School officials should maintain adequate and current information on each school facility within their administrative unit regarding the following areas:

Personnel Services:

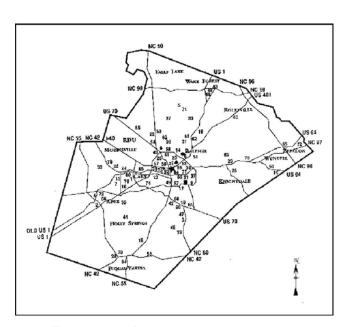
Since the basic purpose of the school system is to serve students. school officials need current and historical data about the students. **Educational services** and teaching and administrative personnel must be chosen and organized to meet the educational requirements of students. Information should include student membership, staffing, local board of education, administrative organization, and central office staff.

Finance:

A clear and concise analysis of school finance will identify costs related to sites. Total school costs should include purchasing, planning, developing and maintaining school site costs. Studies of financing practices may result in appropriate schedule of site purchase and development.

Communications:

Schools are including more extensive use of media, especially electronic, which may reduce the need for physical facilities at school sites. Media broadcast services (audio and visual) are having a major impact on education within schools today.



Transportation:

A study of transportation practices may help determine optimum locations for school sites. Helpful information will include recent and/or current transportation maps, routes and statistics.

Educational Program:

Statements about the educational programs of the schools in the administrative unit will be useful in selecting and planning a school site. Educational programs should identify experiences and activities that can take place outside the school buildings, both on the school grounds and off campus.

Facilities:

Obviously the information base should include accurate and complete information about all existing property owned by the local board of education. A complete system of property accounting should include complete floor plans of all buildings. construction dates, site plans of all campuses, and a description of construction, including the mechanical, plumbing and electrical system within each building.

Replacement or Abandonment of Older Buildings

While older schools and historic buildings provide communities with a strong link to their past, careful, thoughtful consideration should be taken as to the viability of renovating and expanding older structures and sites which usually have aging infrastructure and environmental impacts. Additionally, the Office of the State Superintendent of Public Instruction reviews older structures and sites with regard to safety, sanitation and functional adequacy in order to insure that public health, safety and welfare needs are met. Prior to issuance of a Certificate of Review, School Planning may request documentation that a project is supported by local, state and federal agencies with governance over historic structures and sites.

Historic school structures and sites are a valuable part of North Carolina's rich history and should be preserved whenever possible. In the event that an older school cannot feasibly be renovated and expanded, efforts should be made by the school system to determine if the building and site can be repurposed by the community for other uses prior to considering abandonment or demolition. Demolition of Historic Buildings must follow the procedure of the US Department of the Interior.

The renovation of the older school must result in a facility that delivers a modern acceptable educational program. If not, the renovation may be better suited to a non-educational use.

A "Feasibility and Cost Analysis" form is available from School Planning to assist local school units in the evaluation of existing facilities and sites regarding the advisability of renovating or replacing an old building. The form must be submitted to the State Superintendent through School Planning if an old building is to be replaced with a new facility. The "Feasibility and Cost Analysis" is also valuable for evaluating the desirability of renovating an existing school, as opposed to replacing it.

Something to consider:

Preservation and adaptive reuse are key components of sustainable schools and smart growth for the following reasons:

- reuse of existing structures and sites helps encourage economic development in deteriorating areas
- existing buildings and sites take advantage of available infrastructure (road and sidewalk networks as well as utilities)
- historic school buildings are often within established neighborhoods where the school is a key community anchor and landmark

- reusing existing buildings, whether historic or not, reduces the burden on landfills. While historic school sites may not be able to meet traditional programs within a particular school system, alternative programs can and should be considered that take advantage of the schools attributes.
- a thorough environmental and infrastructure evaluation of the site and building should be done prior to considering redevelopment and reuse of historic structures to determine the cost factors involved in the renovation.

Selecting a School Site

The primary purposes of a school site is to provide a place and an environment that are conducive to the learning/teaching experiences that benefit youth who attend the school.

When a new school site is needed, the school system should set up a committee of school board members and administrative personnel that will be responsible for selecting potential sites. This committee should then take the following five steps:

Step No. 1: Educational Program

Prepare an educational program for the site that identifies experiences and activities that will take place outside the school buildings, both on the school grounds and off campus. The following areas and activities should be discussed in relation to the proposed site selection:

- · physical education and athletics programs
- nature and conservation education
- · after-hours educational use of facilities
- use of off-campus facilities for educational purposes

Step No. 2: Technical Requirements

Prepare a list of technical requirements or general criteria regarding the features and characteristics that are desirable for almost all school sites. The criteria, together with the educational program for the site, is a set of "standards" or "desirable characteristics" against which potential sites can be evaluated and selected. General criteria should include the following types of topics:

- size
- shape
- location
- topography/drainage
 soil conditions/plant life
- access/traffic
- security/safety
- noise levels
- utilities
- costs
- no hazards

Each topic listed above is defined in more detail on pages 11 to 18.

Step No. 3: Site Selection

The committee should choose a general area where the school should ideally be placed. Then the committee should consider several tracts of land within this general area that appear acceptable based on the educational program and technical requirements. Each tract of land should be analyzed equally and thoroughly with a prepared list of questions that cover all potential site concerns. The committee may also decide to obtain the services of an architect, landscape architect and/or engineer to help in this selection process.

Step No. 4: Priorities

The next step is to rank all potential sites in order of priority. Then make a final decision on one site to be purchased. Before purchasing this site it is wise to invest some extra money and time in having soil boring tests made to avoid possible costly surprises later. It is also good to consult with the officials of the appropriate government agencies where on-site water supply and sewage disposal systems will be required and the Department of Transportation or municipal street officials to obtain assurances that adequate and safe access to the proposed site is feasible. If the chosen site presents potential costly problems, it may be wise for the committee to select its second choice and perform a new set of soil boring tests, and so on until a suitable site is found.

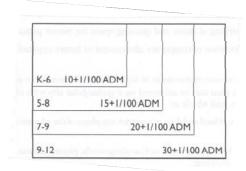
Step No. 5: Acquisition

The final step in the site selection process is to begin negotiations on the chosen site and make an offer to purchase. Although the purchase price and/or costs of a new piece of school property may involve many thousands of dollars, the first cost must be compared to the total cost of purchasing the land, developing it, building on it, operating and maintaining it. If the purchase price is seen in this context, the site with the lowest per-acre purchase price may not necessarily be the best buy. After careful scrutiny by school officials and the site selection committee, legal counsel should take steps to get title to the selected property. Note: Under NC GS 115C-521(d) no contract for the erection of a school building can be made, until the site is owned in fee simple by the board.

Technical Requirements

Size: Good judgment beyond the mere application of minimum standards is needed to determine the appropriate size for a site.

Site Size In Acres of Land by Grade Levels



The diagram above shows the site size in acres of land by grade levels. As an example: a Middle School (grades 6-8) with 800 students (ADM) would require a minimum of 15 acres, plus 1 acre per 100 ADM or 8 acres, for a total of 23 acres.

The **usable** site should be large enough to hold the necessary building(s) and spaces for outdoor instruction, recreation, parking, and any future expansion to building(s) and play areas.

- The above guidelines assume a rural or suburban area with a one story building, room for expansion, desirable outdoor play areas and all parking, queuing and buses located on site. Urban sites and areas that follow the tenets of "smart growth" may find creative solutions on substantially smaller sites. This may involve off-site parking, bus loading only (no bus parking), limited play areas, multi-story construction and sharing of certain facilities with other adjacent entities. (Refer to www.schoolclearinghouse.org, our website, and the publication entitled "Making Current Trends in School Design Feasible" for more information.
- For schools in open country or sparsely settled areas, acreage may justifiably exceed those recommended above.
- For schools located immediately adjacent to parks and recreational land, acreage of school-owned land may be modified.
- For schools requiring on-site water or sewer, substantial additional acreage may be needed.
- A high school may need an additional 10 acres or more if a stadium and spectator parking are anticipated.

Usable land is often significantly less than the total site size. When estimating needed site sizes, make allowances for such special restrictions as:

- Zoning setbacks and vegetative buffers around the perimeter of the site.
- Future road right-of-way increases due to heavier traffic.
- Wetlands, creeks and drainage ways or slopes too steep to build upon.
- Adequate land for parking of buses and queuing space for parent pickup.
- Additional land for location of temporary classrooms or future expansions.
- Utility Easements

The optimal size of a school site is relative to the state and local regulatory requirements that govern a particular site's development. In NC, where water quality and water conservation are critical environmental issues, site development is often governed by the protection of water bodies, wetlands, stream buffers and impervious limitations. As a result, it is difficult to develop a rule of thumb for the amount of acreage that is required for schools.

These limitations have resulted in the following innovations in school design across NC:

- The development of multi-story schools to reduce building footprints (which
 reduces the amount of land that must be acquired, reduces impervious area as
 well as the size and cost of stormwater devices and site clearing and grading
 costs)
- The co-location of multiple schools on one site where media centers, auditoriums, cafeterias, athletic fields and bus/car parking can be shared
- The co-location of community facilities (parks, libraries, community centers, etc.) where peak usage often differs from schools so that parking demands can be reduced and shared.
- Environmental education programs integrated into school curriculums that teach water conservation, water reuse and water quality enhancement.
- The development of specialized schools with programs that can be accommodated on smaller, urban sites where extensive athletic programs are not a priority
- The creation of "Walk to School" programs to reduce peak morning traffic congestion on major roads as well as carbon dioxide emissions from idling cars and buses in the afternoon.

Shape: Sites with shapes almost rectangular in form are usually easiest to plan. As a very general rule-of-thumb, an efficient plan can be achieved on a rectangular site with dimensions in a ratio of approximately three to five and which is:

- Suitable for efficient use of land and does not restrict any phase of the educational program.
- Adequate to accommodate outdoor areas such as playgrounds, physical education and athletics fields, recreational spaces, and buildings.

Location: The location of a school is a very important factor, but it must not dominate if too many other desirable features are sacrificed. The site should be:

- Convenient and readily accessible to present and/or future school populations to be served, and to the public for community use educationally or recreationally.
- Conducive to the possibility for interrelationships and joint planning with other public facilities, such as parks, libraries, museums, etc.
- Accessible at reasonable cost to public roads that are adequate to accommodate the added traffic generated by the school.
- In a community that is safe and readily accessible to students, utilities, and services, but free from noise, air pollution and other disturbing elements. Industrial areas and transportation service areas, such as railroad, truck or air terminals, are not suitable for school locations.
- Located, where bus transportation is involved, so that the maximum travel time for elementary students should rarely exceed seventy-five minutes and ninety minutes should be the limit for middle school and high school students.

Topography and Drainage: Inadequate drainage or excessive earth moving can cause continuing problems.

- Ideally, the site is gently sloping with an elevation and contour which will ensure good drainage.
- The site should be adaptable to intended use without massive and costly earth-moving activities or destruction of desirable land characteristics.
- The site should have a type of subsoil that provides a good base for building footings and foundations. Surfaces and subsoil that have been filled with debris are generally unstable.
- The site should allow for natural gravity flow of sewage on or from the site, preferably without use of pumps.
- Provide an adequate amount of level area for physical education, some uneven and wooded areas with a variety of tree and plant life, and some water area for use in various parts of the educational program.
- Check all sites for wetlands and/or flood plains before purchasing.

Access and Traffic: Ready, safe and economical access to the school site is basic. The site should:

- Be accessible at reasonable cost to public roads and/or streets that are adequate or made adequate to hold the added traffic generated by the school.
- Provide adequate frontage to provide safe access from roads or streets approved by the Division of Highways of the N.C. Department of Transportation or by local street departments.
- Avoid sites that are located on major highways or roadways with posted speed limits of 55 mph or greater. NCDOT is becoming more reluctant to approve driveway permits directly from these roads.
- Be adjacent to or readily accessible to modes of transport useful to students and staff: school buses, private vehicles, public transportation, bicycles and/or pedestrians.
- Whenever possible, locate new schools within ½ mile of existing neighborhoods where students can walk to school.
- When schools must be located in rural areas, it is desirable, that adjacent land uses or zoning promotes residential growth at densities of 6 or more dwelling units per acre to encourage future walkability.

- Not be too close to congested traffic arteries or highways that are noisy and will cause delays or special hazards for school traffic.
- Be adequate to handle peak load traffic at the beginning and end of the school day and for after-hours public assembly activities without undue delay or hazards.
- Adequate network of road systems to reduce the need for off-site improvements for bus or car queuing.
- Avoid locations near manufacturing plants with large employee work forces.

Security and Safety: Local conditions may demand special attention to this factor.

- Select locations where regular periodic inspections by police authorities are possible.
- Site should be convenient to a fire station, police station, hospital and/or rescue squad.
- Provide adequate site lighting to discourage mischief and/or vandalism and install fencing around play areas to give students a sense of security, especially in elementary schools.
- No student should have to cross any roadway to get to playgrounds, buildings or other campus facilities.
- Avoid locations near neighborhood social hazards, such as areas with high incidence of crime or drug and alcohol abuse.
- Locate away from industrial and manufacturing plants to avoid bad air quality problems, such as odor, dust, noise, and hazardous materials or processes, etc.

Soil Conditions and Plant Life: A careful investigation of what is below and above the surface of the land is necessary before purchase of a site. Adverse soil conditions such as rock, poor bearing soils, high water levels and soils impervious to water will usually cause difficulties and increase development and perhaps operation costs.

- Sub-surface soil conditions should provide adequate drainage and support for structures at a moderate cost.
- Select soil capable of growing, at reasonable cost and treatment, the necessary and desirable turf and a good variety of other plant materials. Vegetation is an excellent absorber of both sound and heat and can also beautify the environment.
- Provide suitability for on-site sewage waste disposal systems, if necessary.
- Soils that permit proper percolation will make lawns, playgrounds and athletic facilities easier and less expensive to maintain.

Noise Levels: Noise generated by modern technological devices may exceed desirable conditions for schools.

- Noise should not be serious enough to cause interference with communication.
- The site should be far enough from air traffic and high speed vehicular traffic (especially trucks and buses) and noisy industrial or commercial enterprises.

Utilities: Water, sewer, electrical services and broadband must be available to all sites. Community cable television and piped gas may also be available.

- Water supply and sewage waste disposal services from municipal or district systems are preferred to on-site systems.
- Where municipal water and sewer is not practical, soils must support septic or alternative
 wastewater systems. Innovative water reuse and reduction methods that reduce the use of
 wells (which deplete aquifers) are recommended.
- If on-site water supply and sewage disposal are needed, they must comply with requirements of appropriate health and environmental agencies. (NCDENR is rapidly moving to a position of not allowing school sites that would rely on an on-site well.)
- Electrical service of adequate capacity should be available at reasonable installation cost.
- Select sites that do not have electric power transmission line easements that cross or border the property.
- If the chosen site does have power transmission lines, the following limits should be considered:
 - 100 feet from edge of easement for 100-110 kv line
 - 150 feet from edge of easement for 220-230 kv line
 - 250 feet from edge of easement for 345 kv line

These limits are based on an electric field strength graph developed by the Southern California Edison Company. (Experts still do not agree to what extent transmission lines pose a health hazard, if any.)

Costs: Besides the purchase price, the cost of planning, developing, operating and maintaining a site must be considered to determine the true cost of a site. Considerations should include:

- Whether initial purchase price is in line with current costs of similar property.
- Site availability at a cost that is not exorbitant and which reflects desirable aesthetic qualities.
- Administrative costs: fees for consultants in site-selection and planning processes, and fees for legal services associated with procedures for acquisition.
- Development costs: clearing, grubbing, demolition, grading, paving, erosion control, storm drainage, rock removal, soil analysis and treatment, plant materials and their installation, transportation cost differences, and access to and/or installation of waste disposal systems and other utilities.

- Operating costs: regular tending, cleaning, mowing, gardening, pruning, waste disposal system.
- Maintenance costs: erosion control measures, repairs to paving and walks, reestablishing turf, restoring trees and shrubs, repair of outdoor equipment.

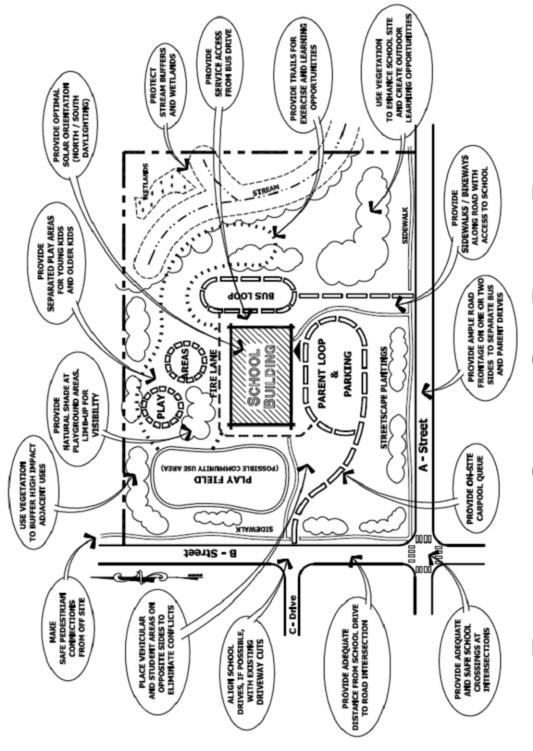
Worksheet for Prioritizing Sites

Site Identification:	Grade Level:	
Site Location:		
Total Acres:	Estimated Value:	

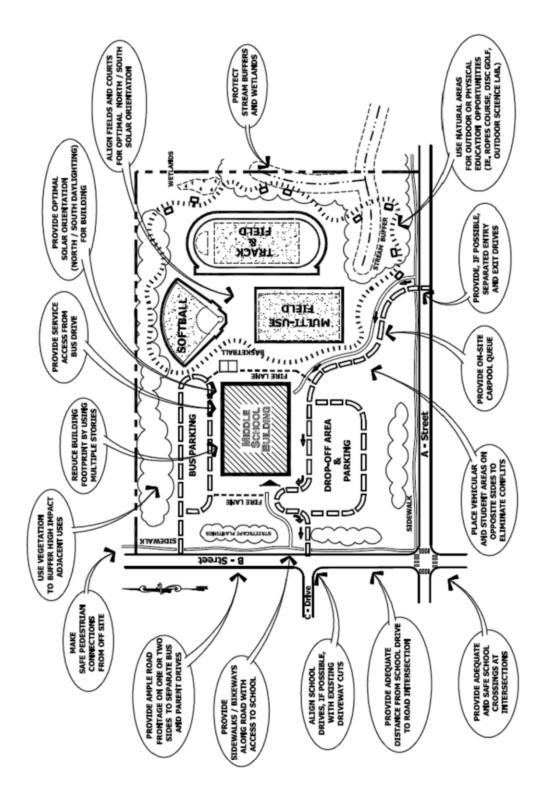
0	1	2	3	4	5	Total
	0	0 1				

Total Points x 2 (100 points possible)

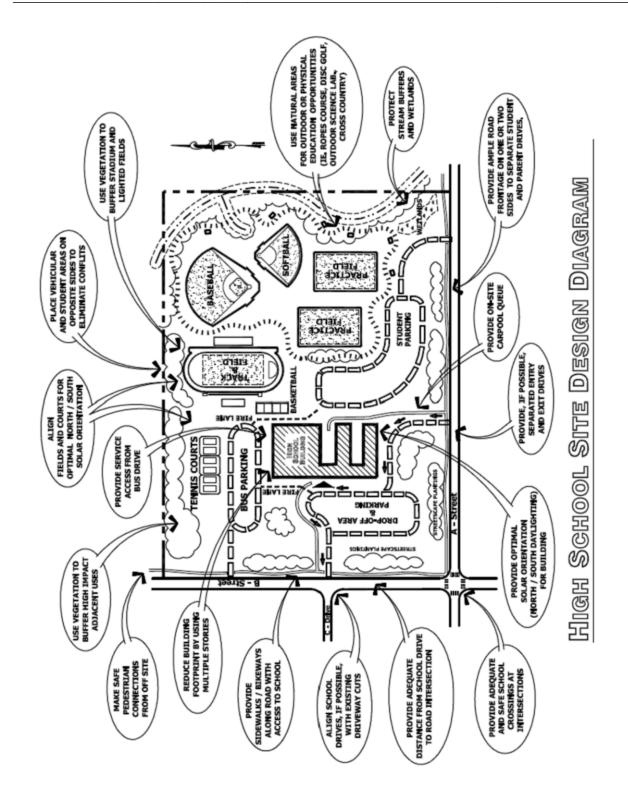
^{*} LEA – specific factors may be added where desirable.



Design Diagram SCHOOL SITE **ELEMENTARY**



Middle School Site Design Diagram



Developing the School Site

To a community, the appearance of the school site often determines the perceived quality and care for education. Beautiful, functional buildings placed on adequate grounds in an attractive environment help to create in children an appreciation for schools and in adults an added civic interest and respect for the dignity of education.

Site planning is based on a thorough analysis of the site, determination of human needs, determination of requirements for other uses, and provision for transportation, communications and utilities. Site planning establishes immediate and long-term uses of the site. When planning a school site, the following steps should be taken:

Step No. 1: Topographic Survey

A good boundary line and topographic survey of the chosen site should be obtained with an agreement between the owner and design professionals that clearly defines the site information to be recorded. Site surveys should meet the requirements of the local reviewing agency for site plan approval, but as a minimum they should include information such as:

- title of survey, property location, certification and date
- scale and compass orientation
- tract boundary lines, courses and distances
- names of abutting property owners
- topographic contours and bench marks with assumed elevations
- names and locations of all existing road rights-of-way and easements.
- location, size and names of significant plant life and trees
- existing use of land and of adjoining land
- · existing structures and other site improvements
- existing utilities or closest connections
- zoning designations, setbacks, buffers, acreage, and easements
- location and sizes of wetlands
- indication of flood plains

Step No. 2: Learning the Site

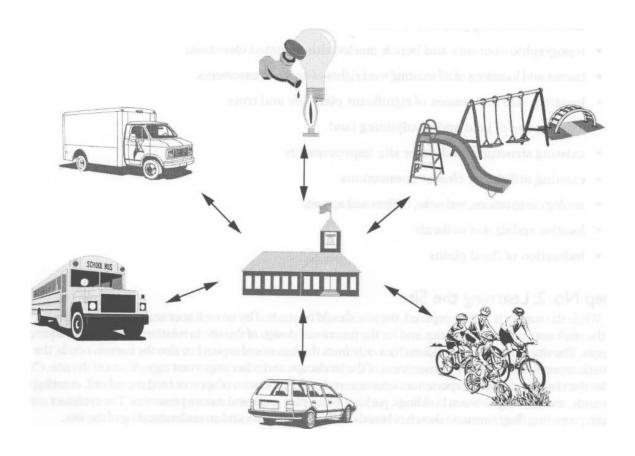
While the survey is being prepared, the site should be studied by an architect and engineer for the feeling of the site's natural characteristics and for the functional design of the site in relation to the user's requirements. The site needs to be considered not only from the functional aspect but also the human needs, the artistic aspects, the desirable pleasantness of the landscape and other important ingredients of the site. Consider the visual and spatial experiences encountered in the processes of approaching the school, entering the grounds, and moving between buildings, parking areas, play areas and nature preserves. The architect can begin preparing diagrammatic sketches based on all collected data and an understanding of the site.

Step No. 3: Site Components

Once the topographic survey is completed, a more refined master plan for the site can be developed. The master plan establishes a basic order or process to the site by following principles that establish immediate and long-term uses of the site. Always give paramount emphasis to life safety with the encounters between people and vehicles. There are seven major components on a school site that are all interrelated.

- The buildings and landscaping
- Bus and van traffic
- Private vehicle traffic
- Service vehicle traffic
- Pedestrian traffic and provisions for the physically disabled
- · Utilities, sedimentation control, and storm water drainage
- Playgrounds, athletics fields, and recreation areas

Each of these components is defined in more detail on the following pages.



Components of a School Site

A school site is made up of seven components which are all interrelated. These components are as follows:

Buildings are permanent or temporary structures that are located on the school site.

Buses are used at all schools to transport students to and from the school site, and include daycare vans, activity buses and vehicles for the handicapped.





Private vehicles include four categories of vehicles: visitors, staff, students, and parents that pick up or drop off children at school.

Service vehicles usually come once or twice a week to deliver food to the kitchen, pick up trash or to deliver supplies.





Pedestrians include visitors, staff, parents, and students, either on foot or on bicycles.

Utilities include public services such as electric power, gas, water, telephone, cable television, etc.





Playgrounds are areas on the school site designated for outdoor games and recreation and include play structures, paved play areas, open grassy areas, football fields, baseball fields, running tracks, etc.

Buildings and Landscaping

Planning and Design Guidelines

RECOMMENDED

- Locate buildings sufficiently away from roads and streets to minimize traffic noises and hazards.
- Design buildings that can accept changing educational programs and future expansions.
- Plan buildings and sites as one unit with service drives near kitchens, shops, stages and storage areas; place bus loading/unloading near large-group core facilities; locate vehicular parking near athletic areas, etc.
- Provide drives that are well illuminated and defined with curbs, gutters, and signs directing traffic.
- Provide creative functional grading of the site to improve the appearance of the building and provide screening from noise, wind and other climatic elements. Use vegetation to discourage erosion, mark boundaries to provide shade and shelter, channel pedestrian traffic, provide visual and aural screening and provide a noise buffer.

- Avoid buildings that are not sensitive to the scale of the user or in keeping with the neighborhood.
- Avoid steep slopes, low spots and barren areas in the landscaping.
- Avoid plants and landscaping that blocks the vision of vehicle drivers entering or leaving the school site.
- Avoid sites that are too small to meet the educational needs.
- Avoid hazardous entrances off main thoroughfares.
- Avoid parking cars parallel to curbs.
 This can cause traffic congestion and create a serious safety problem if students should step into traffic.
- Students approaching buildings on foot should not have to cross main traffic arteries.

RECOMMENDED

- The site planning and building orientation should be designed to minimize use of conventionally powered heating, cooling and lighting by using natural energy available at the site. For instance, to take advantage of daylighting, the classroom wings and the individual classrooms, as well, should have their long axis running east-west.
- Make the main entrance to the school building obvious to visitors.
- General statute 143-214.7 mandates that any area designed for use as a vehicle parking area shall not exceed 80% built-upon area, as defined in S.L. 2006-246. The remaining area shall meet the requirements for a permeable pavement system.
- In order to encourage walkability and biking, locate the school entrance with a clear, unobstructed path for walkers and bicyclists. Provide bike racks in clearly visible areas in front of the school and whenever possible, provide showers and changing rooms for teachers and staff to encourage their use of alternative modes of transportation.

- Avoid buildings with screen walls and/or retaining walls that provide easy access to the roof.
- Avoid grass in enclosed courtyards due to maintenance problems. A mixture of paved areas and heavily mulched planting beds work well. Avoid plain concrete, as it can cause "snow blindness". Also oversize or provide two means of drainage to avoid creating a swimming pool when a drain stops up.

Buses

Planning and Design Guidelines

RECOMMENDED

Provide separate driveways and parking lots for buses and cars.

- Place bus entrance near core facilities such as the gymnasium, multi-purpose room, cafeteria, or media center.
- Park buses in a single row facing the building at an angle between 45 and 90 degrees so the bus doors are visible for supervision.
- Provide an adequate turning radius (45'- Don't park buses so they have to back 0" min. outside & 26'-0" min. inside) within parking lot.
- Provide a covered walkway for students to use during inclement weather.
- Locate bus parking lots near after-hours athletic event sites for additional vehicular parking.
- Park buses whenever possible to reduce idling and carbon dioxide emissions.

- Avoid mixing parent drop-off driveways with bus driveways.
- · Avoid unloading bus students into narrow classroom corridors.
- Don't park buses in two rows, one behind the other.
- up to turn or park.
- Don't load or unload students where they have to cross a vehicular path before entering the building.
- Avoid landscaping that blocks or interferes with the bus driver's vision.
- Avoid idling buses within 50' of operable windows or building primary entrances.



Service Vehicles

Planning and Design Guidelines

RECOMMENDED

- Service vehicles may share the same driveway and parking lot with buses.
- Locate dumpsters at the end of a driveway where the trash truck can easily empty the dumpster. Provide adequate paved area for the trash truck to turn around.
- Provide adequate paved area for trash trucks and delivery trucks to access the loading dock and to turn around.
 Remember: Delivery trucks have to turn and back up to the dock and the trash truck has to drive up to the dock and back out to turn around before leaving.
- Provide adequate fencing, railings and/or bollards to protect buildings, mechanical and electrical equipment and the pedestrian from service vehicle movement.
- Fire access drive entrances: Control vehicular traffic by means of a gate or "break-away" bollards. Provide no curb cut so that, if the gate is left unlocked, casual vehicular traffic is still discouraged.

- Don't circle school buildings or campuses with service drives that children have to cross to access playgrounds.
- Avoid placing dumpsters in remote locations away from buildings. Usually, dumpsters are best located near loading docks for the kitchen.
- Avoid screen walls that have small entrances or a tight turning radius.
 Provide plenty of paving within the screen wall area or delete the screen wall. Do not install gates, for they are very rarely used and are often left open.
- Avoid screen walls that obstruct the vision of the driver or the pedestrian crossing the driveway.



Private Vehicles

Planning and Design Guidelines

RECOMMENDED

- Provide separate driveways and parking lots for cars and buses.
- Provide an adequate driveway for lining up cars on site that are waiting to drop off or pick up students, with two lanes heading in the same direction. (Counter-clockwise so passenger side of car is towards school.) Any parking along this drive should be angled and located on the left-hand side, away from the drop-off/pickup walk.
- A single line of 60 cars equals almost ¼ mile in length.
- Locate the student drop-off area near the administrative office and main entrance. Provide a covered walkway for use during inclement weather.
- The driveway along the drop-off/pickup area should be as straight as possible to facilitate parent cars getting the proper distance from the curb.
- Provide separate parking lots for teachers and students. Combine visitor parking with the parent drop-off driveway located near the main entrance and administrative office.
- Designate parking spaces for disabled persons and visitors close to the main school entrance.

- Avoid sharing the same entrance drive with buses.
- Avoid driveways with two-way traffic where children may cross the path of a moving vehicle.
- Avoid driveways that allow parents to take short-cuts through parking lots to drop off or pick up students. This type of parking layout encourages students to cross vehicular paths.
- Avoid landscaping that blocks or interferes with the driver's vision at intersections to the school or on the site.

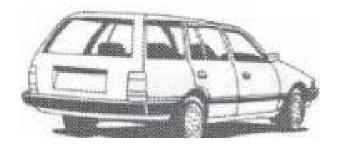
Something to consider:

An average of almost 50% of students are car riders in NC; as a result, the NC Department of Transportation recommends upwards of 1/3 to ½ of a mile of on-site car queuing to accommodate this phenomena.

The result is increased acreage requirements, extensive on-site car queue lines and offsite road and intersection improvements to accommodate for the high peak traffic demands.

In an effort to promote bus ridership, walking and biking, the following site design alternatives should be considered:

- Provide a convenient, covered, accessible drop-off/pick up area for special needs students only.
- Provide a convenient, covered, accessible loading area for buses that is closer to the school than the car loading area (with the exception of special needs children).
- Provide strong walking and biking connections to the school site from adjacent streets, neighborhoods and greenways.
- Provide convenient preferred parking spaces for low emission vehicles and those
 with special needs however, all other parking spaces should be located far enough
 away from the school that it is clear that priority is given to walkers, bikers,
 playgrounds and open space.



Pedestrian Traffic

Planning and Design Guidelines

RECOMMENDED

- The site should be designed with respect for the safety and convenience of users.
- Lay out sidewalks by following the lines of least resistance and connecting buildings with short, direct walkways.
- At all changes in direction or sidewalk intersections, flare the sidewalk corners sufficiently to prevent walking on grass.
- Design wide sidewalks to meet the needs of pedestrians using them. Use a minimum width of 5 feet and increase width in high volume areas.
- Provide adequate lighting at entrances, steps and along sidewalks to promote safety and enhance the appearance and security of the building.
- Provide paved student gathering areas in convenient locations that are adequate in size, well lit and easily supervised.

AVOID

- Avoid or minimize road crossings by the students and staff.
- Avoid single-step trip hazards on sidewalks; provide a minimum of three steps and illuminate.
- Avoid 90-degree intersections on sidewalks.
- Avoid narrow sidewalks; people do not normally walk single file.
- Avoid sidewalks that have shallow steps, hollow cracks, deterioration, or areas that pond water. Make sure sidewalks drain well.
- Avoid dark alcoves and deep recesses along the building perimeter. These areas are hard to police.

- Handicapped access is required to the playgrounds/playfields by the NCSBC.
- Direct access to play-fields from the gym locker rooms should be provided so that students don't have to cross any vehicular traffic ways or parking lots.



Utilities

Planning and Design Guidelines

RECOMMENDED

- Install fire hydrants around the building and site with easy access by fire trucks.
- Provide enough ground width around the building for easy fire truck access and police surveillance.
- Provide adequate water supply with sufficient pressure for both fire protection and irrigation if required.
- Try to select sites that have access to municipal water supply and sewer waste disposal systems and piped natural gas.

Locate in an area with good TV reception or with cable access and with broadband internet.

AVOID

- Avoid paved driveways around the building. But comply with the minimum requirements for fire trucks access roads per the N.C. Fire Code.
- Avoid overhead power lines or cables on the school site wherever possible.
- Avoid sites with any utility easements that divide the site into parcels.
- Avoid sites that require long runs for access to municipal utilities.



Playgrounds

Planning and Design Guidelines

RECOMMENDED

- Separate playgrounds from streets and parking lots.
- Kindergarten and first grade classes should have separate playgrounds fenced in for safety and supervision. This is required for Pre-Kindergarten.
- Playgrounds should be well drained and free of holes, debris, poison plants, rocks, and other hazards which may lead to accidents. Provide approved playground surfacing. Plan for maximum safety.
- Solid surface playground surfacing is recommended for ease of maintenance, resiliency and durability where loose fill surfacing cannot be regularly maintained.
- Locate playgrounds and athletic fields near gym or classroom buildings for safe/easy access by the students, but not so close that it disrupts the classrooms environment.
- Provide good separation between quiet and active play, as well as between play for different age groups.

AVOID

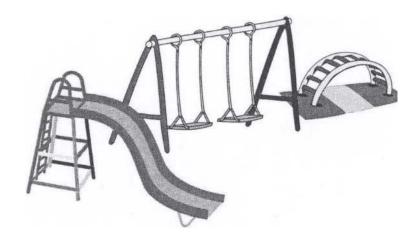
- Avoid playgrounds that children must cross a vehicular path to access.
- Avoid playground equipment with sharp edges, hazardous projections and rough surfaces that may cause injury or entangle children's clothing.
- Avoid grading level surfaces too flat.
 2% grade (2' per 100) is desirable.
- Avoid hard surfaces beneath playground equipment.
- Avoid locating the playgrounds and athletic fields too close to highways or streets. Install fencing around the property for security and safety.
- Loose fill surfacing under play equipment that is non ADA compliant.
- Avoid laying out playgrounds that become throughways to other areas.
- Avoid crowding play equipment or children. Provide plenty of room for jumps or falls.

RECOMMENDED

- Arrange playgrounds and athletics fields with easy access by maintenance trucks, spectators and/or community users.
- Every effort should be made at elementary schools to provide a large, soccer-sized grassy play area.
- Provide access to natural or wooded parts of sites whenever possible. Install nature trails.

AVOID

• Avoid baseball fields with a skinned infield at elementary schools.



Planning a Playground

The school playground is important not only because kids love to play, but because it is critical to their health and development, physically, mentally and emotionally, which will have a direct impact on their education. School Planning recommends more open unprogrammed play areas for large and small group activities rather than playgrounds with fixed equipment. Outdoor free play is integral for prevention and treatment of childhood obesity and depression and anxiety related illnesses, all of which are on the increase in today's children. Because children spend most of their waking hours at school, schools need to provide and encourage opportunities for physical activity aside from physical education classes.

Playground equipment should not be the main focus of the play area. Playground equipment presents too much liability to the school system, with the increasing number of equipment-related injuries and deaths. Large group activities in unprogrammed play spaces help teach teamwork and sportsmanship and are easier to supervise. According to the American Academy of Pediatrics (AAP), at the elementary school age, fundamental skill development is still important. Skills such as visual tracking, balance and more finely tuned gross motor skills can be developed in open unprogrammed spaces with ball throwing and catching, jumping rope and dancing. Opportunities for small group and individual activities should also be provided to promote creativity, leadership and self-motivation.

For Pre-school ages (4-5 years) unorganized free play with little direction is more important. Again, play equipment can provide some of the physical developmental needs, but an open unprogrammed space is necessary for the development of social skills and imaginary role play.

A study published by the Consumer Product Safety Commission showed that there were approximately 170,000 playground equipment related injuries treated in the U.S. hospital emergency rooms in 1988. Most of the incidents on public equipment occurred in schoolyards and public parks, each accounting for about 40% of all injuries. These equipment-related injuries continue to increase each year. The Journal of American Medicine reports that rates of obesity remain high with 31.9% of children and adolescents aged 2 through 19 years at or above the 85th percentile of the 2000 BMI-for-age growth charts. In 2004, Medco Health Solutions reported that for the first time, spending on drugs for depression and attention disorders surpassed that of spending on antibiotics and asthma medications for children.

Planning A Playground

The most important thing to remember in planning a playground is the safety of the children. All Playground equipment must be well maintained regularly and the playground area kept clean of any broken glass or other dangerous debris. Recommend engaging the services of a certified playground inspector in designing, selecting equipment and instruction.

Locating a Playground On a School Site:

- Consider areas that are free from hazards or obstacles to children traveling to and from the playground.
- Surround the playground with non-toxic plants or fencing to prevent small children from inadvertently running into a street or leaving the playground unsupervised.
- Locate a fenced-in playground for pre-kindergarten children next to their classroom. (Consider locating the Pre-K classrooms with a southern exposure. Playgrounds on the north side will not receive enough winter sunshine.)
- Locate a fenced-in playground for kindergarten and first graders close to their classroom wing and away from the playground for older children.
- Keep vehicular traffic away from the areas designated for playgrounds.
- Locate playgrounds and athletic fields close to the multi-purpose rooms and gymnasiums.
- Play area should be sized to provide a minimum of 50 sf. per child.
 (National Head Start Study, 2003) (Pre-K: 75 sf)
- Use play equipment with generic themes to encourage imagination development.

- Keep playgrounds and athletic fields away from on-site sewage waste disposal systems and nitrification fields.
- Provide shade features on east, west and south sides of play areas.

Important Tips on Locating Playground Equipment:

- Separate active/physical activities from passive/quiet activities.
- Keep clear sight lines over the entire playground for supervision.
- Disperse popular or heavy-use equipment to avoid crowding.
- Locate moving equipment away from high activity areas.
- Locate exits to slides in non-congested areas.
- Provide separation of equipment by age groups:
 Preschool (4 to 5 years old) and School-age (6 to 12 years old). Consider further separation of older group (6 to 9 years old and 10 to 12 years old).
- Consider ADA guidelines for accessible playground equipment at: http://www.access-board.gov/play/ Refer to page 42 for additional information regarding handicapped accessibility of playgrounds.

General Hazards Related to Playground Equipment to Avoid:

- Avoid sharp points, corners or edges; provide rounded edges with a minimum radius of ½ inch.
- All wood should be smooth and free of splinters.
- All wood should be insect-resistant or treated to avoid deterioration. Do not use creosote, pentachlorophenol, tributyl tin oxide, CCA, or pesticide containing finishes because they are too toxic or irritating to the skin. [See the School Planning publication "CCA Treated Wood Guidelines".]
- All ferrous metals should be painted or galvanized to prevent rust.
- Protrusions or projections should resist entanglement of clothing. Restrict all protrusions and projections to 1/8 inch maximum.
- Avoid accessible pinch, crush or shear points.

- Avoid openings that could trap a child's head or body. An opening may present an entrapment hazard if the distance between any interior opposing surface is greater than 3.5 inches and less than 9 inches.
- Avoid angles of any vertex less than 55 degrees to one leg horizontal.
- Bury all anchoring devices below playing surfaces to eliminate tripping.
- Keep area clean of broken glass or other hazardous debris.
- Retaining walls should be highly visible and elevation changes obvious.
- Avoid cables, wires, ropes or flexible components in high-traffic areas.
- All fasteners, connecting, and covering devices should not loosen or be removable without the use of tools and should have a corrosion-resistant coating.
- All bearings in moving joints should be easy to lubricate or be self-lubricating.
- Avoid bare or painted metal surfaces unless they can be located out of the direct rays of the sun.
- Avoid rung ladders and climbing components as the sole means of access.
- Do not attach a single-axis swing to composite playground structures.
- Fall zones of adjacent pieces of equipment should not overlap.
- Platforms over 6 feet high should provide an intermediate landing.

Four Key Elements of Playground Safety

- Supervising children's play
- Installing resilient surfacing under all equipment.
- Removing hazards such as debris or broken equipment.
- Removing equipment that is too tall.

It is up to parents, teachers and individuals in the community to demand safer play areas and to provide proper supervision for children's play.

For a more comprehensive playground planning guide refer to the U.S. Consumer Product Safety Commission's website www.cpsc.gov for the publication entitled "Public Playground Safety Handbook".

Handicapped accessibility of play areas:

The Architectural and Transportation Barriers Compliance Boards (referred to as the "Access Board") has developed accessibility guidelines for playgrounds (published October 2000). These guidelines are a supplement to the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and, when adopted by the Department of Justice, they will be required standards. (As of the date of this printing, the guidelines are still being reviewed and are not enforceable.) Go to: www.access-board.gov/play/ for a copy of these guidelines.

Alternative Playgrounds/Natural Learning Centers

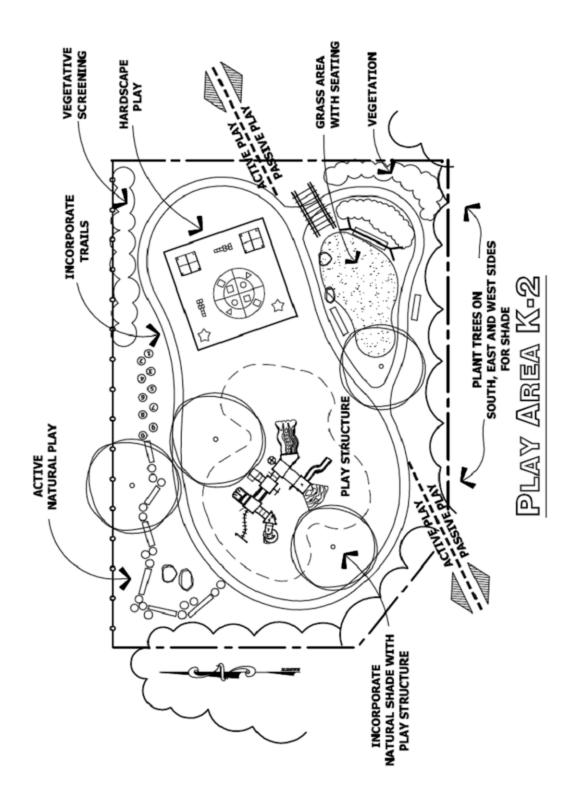
The definition of the school playground is rapidly changing in an effort to reconnect children with the natural environment.

Where traditional playgrounds have consisted mainly of fixed play structures and multipurpose fields, more and more school systems are beginning to integrate nature into their curriculums with an emphasis on science, art and general health and fitness programs for children.

Whenever possible, these alternative playgrounds should consist of the following:

- Clearly marked, accessible trails through natural areas.
- Outdoor learning areas sized to accommodate one classroom located directly adjacent to wooded areas or water features.
- For safety purposes, these areas should be visible from the school building and access to and from any areas with water features should be controlled with fencing and/or gates.
- Include natural features (trees, terrain, boulders, non-toxic shrubbery and ornamental grasses) in play areas to encourage interaction with nature.
- Include space for small group or individual play as well as large group play.

- Include spaces for passive play or rest and reflection and nature study as well as active play.
- Incorporate walking/running trails in play areas. Provide simple destination points along the trail to add diversity and excitement, for example, a small bench, or vine covered arch, entrance to play structure, bird blind, etc. to make the trail more than a physical fitness feature.
- Incorporate an area which can be used as an outdoor classroom setting, preferably at the base of a large shady tree.
- Leave small areas that can be "developed" by the students, small digging mounds or art work display areas.



Transportation

There are several types of vehicles that may use a school site. Each vehicle has its own dimensions and minimum turning radius. The following diagrams and charts are included for quick reference.



SEMI-TRAILER



FIRE TRUCK



SCHOOL BUS



TRASH TRUCK



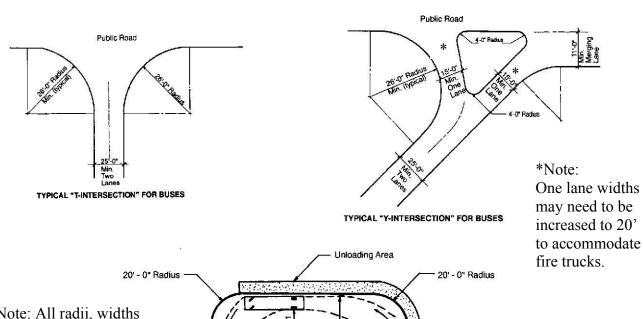
FREIGHT TRUCK



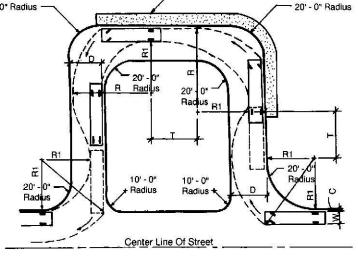
CARS

General Vehicle Information

Vehicle Type	Length (L)	Width (W)	Height (H)	Turning Radius (min)
Semi-Trailer	60'-0"	8'-0"	13'-6"	45'-0"
School Bus	40'-0"	8'-0"	8'-6"	45'-0"
Freight Truck	35'-0"	8'-0"	13'-6"	45'-0"
Fire Truck	32'-0"	8'-0"	9'-8"	48'-0"
Trash Truck	28'-2"	8'-0"	11'-0"	32'-0"
Large Car	18'-5"	6'-6"	4'-9"	23'-0"
Compact Car	14'-9"	5'-8"	4'-5"	21'-6"



Note: All radii, widths and other dimensions shown are for general planning information only. They are subject to current NCDOT standards or governing municipality regulations.

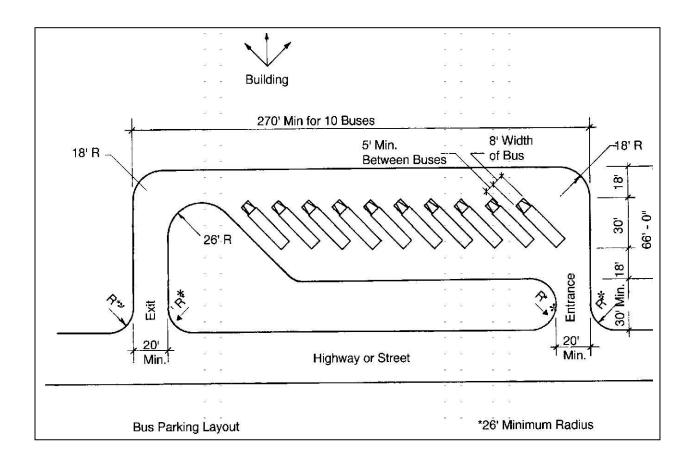


"U" Drive and Vehicle Turning Dimensions

Vehicle	R	RI	Т	D	С
Standard Car	22'-5"	12'-7"	15'-0"	11'-2"	8'
School Bus	43'-6"	26'-0"	30'-0"	19'-5"	1'-0"
*Trash Truck	32'-0"	18'-0"	20'-0"	16'-0"	1'-0"
Fire Truck	48'-0"	34'-04"	30'-0"	15'-8"	1'-0"

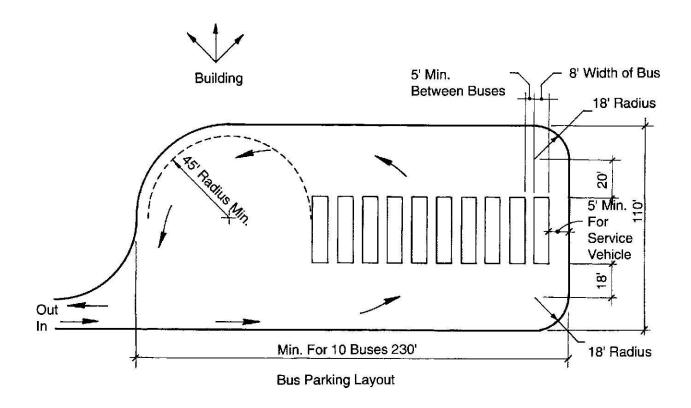
^{*} Depends on whether front load or rear load.

Bus Parking (BP1)



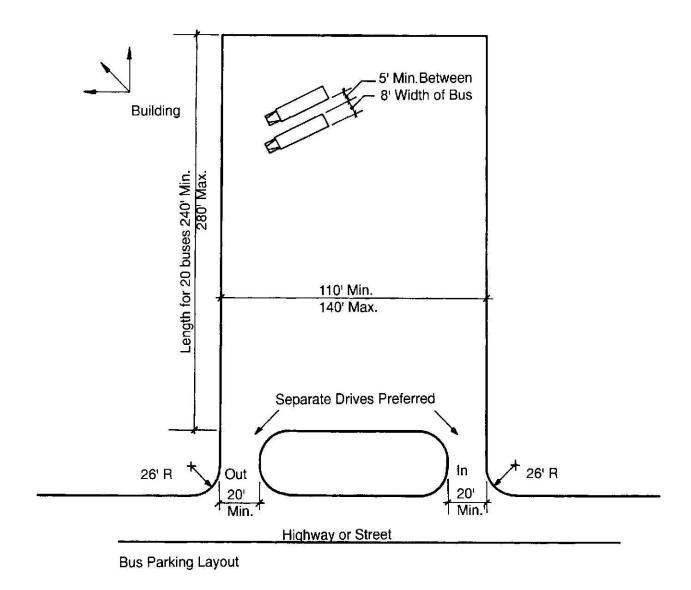
Note:

Bus Parking (BP2)



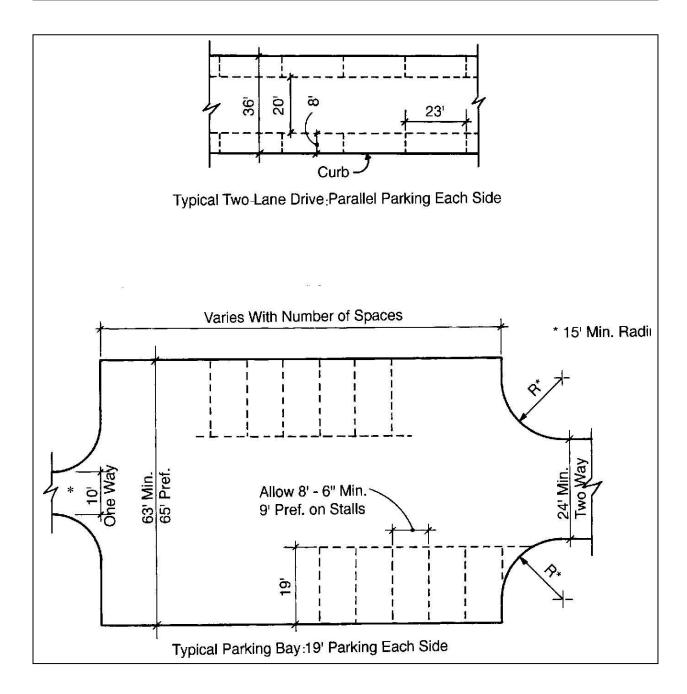
Note:

Bus Parking (BP3)



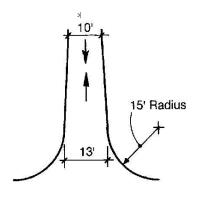
Note:

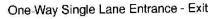
Private Vehicle Parking (P1)

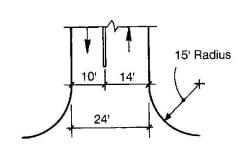


^{*} May need to be increased to 20 ft. to accommodate fire trucks.

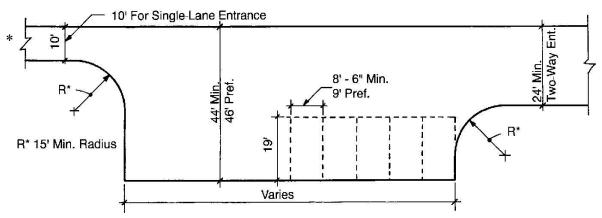
Private Parking (P2)







Two-Way Entrance - Exit



* May need to be increased to 20 ft. to accommodate fire trucks.

Note:

Recreation and Athletic Fields

The following two organizations produce the nationally and statewide accepted standards for athletic field and tennis court design and these standards are frequently updated.

National Federation of State High School Associations

Court and Field Diagram Guide

www.nfhs.org

American Sports Builders Association

Tennis Court Construction Guidelines

www.sportsbuilders.org

In dealing with matters relating to all aspects of the school site, school officials need the services of agencies and professionals who have special information, resources and skills. In the public sector, many agencies and offices can provide assistance and advice at no cost to the school administration. Some of these agencies are listed below, along with the services they can provide.

U.S. or N.C. Department of Agriculture Soil Conservation Service Local Conservation District

Provides and interprets general soil maps that show the major soils and describes their suitability for buildings, playgrounds, waste disposal systems, etc. Determines water problems at specific sites and gives counsel and recommendations regarding flooding, excessive wetness or runoff erosion; identifies existing and possible future soil erosion difficulties; and provides recommendations to reduce or eliminate erosion problems. Appraises existing plant materials and provides services to protect useful plant materials and improve vegetation. Provides advice regarding pond development, nature trails, and other outdoor learning areas. Provides services and counsel regarding maintenance of natural resources and site improvements.

N.C. Department of Transportation Division of Highways

Provides maps and aerial photographs at cost (not available for entire state). Makes traffic studies at or near existing or proposed school sites. Provides roads and bus parking areas according to state statutes and furnishes additional roadways and parking areas in accordance with Division of Highway policies. Evaluates proposed school sites in terms of traffic patterns; approves driveway permits.

N.C. Department of Environment and Natural Resources (DENR) Environmental Protection Division Public Water Supply Section

Provides consultant services relating to present and future school-owned water supply systems. Evaluates quality and adequacy of water supply systems.

N.C. Department of Environment and Natural Resources (DENR) (continued) Division of Environmental Protection Air Quality Section

Provides information about air quality for old and new school sites. Issues rules and regulations regarding smoke abatement and open burning of waste materials.

Water Quality Section

Provides inspection and advisory services regarding sewage disposal services to all schools and recommends and approves installation for sewage disposal systems.

Land Quality Section

Provides advice and issues permits regarding appropriate soil sedimentation and erosion control at schools, with special emphasis on building construction and site improvements.

N.C. Department of Environment and Natural Resources (DENR); Division of Natural Resources; Division of Parks and Recreation; Design Development Section

Provides consultation services to school systems and related agencies regarding community-wide recreational needs, programs and assistance. Distributes information and availability of federal assistance for recreation programs. Promotes recreational planning for cities, counties, and communities. Makes studies of existing and needed recreational programs. Coordinates recreation services of a variety of public and non-public agencies.

N.C. Department of Environment and Natural Resources (DENR); Division of Natural Resources; Wildlife Resources Commission

Provides information regarding conservation, preservation and development of areas and school sites for wildlife.

N.C. Department of Public Instruction; School Support Division; School Planning Section

Offers recommendations regarding proper procedures for site selection, acquisition, development, utilization and evaluation. Offers consultant services in selection of school sites. Reviews, evaluates and makes recommendations regarding site planning and site improvements.

N.C. Department of Public Instruction; School Support Division; Transportation Section

Offers recommendations regarding school bus transportation routes and parkingarrangements on school sites.

WUNC-TV

Engineering Division

Provides consulting services to school systems in testing and evaluating television signal strength at proposed school sites and in recommending television antenna design for specific locations on sites.

Regional, County, or City Planning Agencies

Provide varying degrees of services regarding general placement of schools, with advice regarding zoning, traffic, and coordination with other public agencies.

Regional, County, or City Engineering Services

Provide information and advice regarding existing and proposed water supply, sewer lines, street and other locally owned and operated utility services.

Regional, County, or City Police and Property Protection Services

Provide advice and recommendations regarding planning which can simplify and improve police and fire protection services for school properties.

NC High School Athletic Association

Administers the state's interscholastic athletic program

National Federation of State High School Associations

The body that writes the rules of competition for most high school sports in the United States.

Utilities (telephone, electric, gas and broadband)

Provide information regarding existing and proposed extensions of utility services where existing and future schools may be located. Provide information about proposed business, industrial, residential or institutional development in communities.

Landscape Architects

Concerned with sites in relation to neighboring land and with planning development of specific sites for appropriate uses, including optional uses of site, traffic, erosion control, building settings, and plants.

Civil Engineers and Land Surveyors

Concerned with measuring and documenting characteristics of existing land. Provide boundary and contour maps of the site which offer insight into building placement and site development.

Real Estate Consultants

Can judge if the cost of the site is reasonable. A real estate appraisal is particularly important when an educational institution initiates condemnation proceedings in an attempt to acquire a site. When the right of eminent domain is exercised, the appraiser submits evidence on property value to the court.

Architects and Engineers

Concerned with future uses and development of school property for education and related purposes, and their relationship to utilities, transportation and communication services.

Educational Consultants

Concerned with educational program to accommodate and with services needed to support/ enhance learning experiences.

Acoustical Consultant

Concerned with assessing acoustical conditions at schools and providing consultant services to preserve satisfactory or improve unsatisfactory noise pollution at school sites.

The General Statutes of North Carolina describe the duties and responsibilities of local school boards and their administration regarding school sites. The accompanying list identifies selected sections from several chapters of the General Statutes that deal with these matters:

Chapter 14. Section	14-68. 14-132. 14-236.	CRIMINAL LAW Failure of owner of property to comply with orders of public authorities. Disorderly conduct in and injuries to public buildings and facilities. Acting as agent for those furnishing supplies for schools and other state institutions.
Chapter 40A. Article 2		EMINENT DOMAIN Condemnation Proceedings
Chapter 113A. Article 4		POLLUTION CONTROL AND ENVIRONMENT Sedimentation Pollution Control Act of 1973
Chapter 113A. Section Article 42	113A-71 & 113A-72	VEHICULAR SURFACE AREAS Pavement / bio retention ponds for vehicular parking areas
Chapter 115C. Section	115C-47. 115C-71. 115C-72. 115C-241. 115C-426(f). 115C-509. 115C-517. 115C-518. 115C-518. 115C-521. 115C-522. 115C-524.	ELEMENTARY AND SECONDARY EDUCATION Powers and duties of county and city boards generally. Districts formed from portions of contiguous counties. Consolidation of districts and discontinuance of schools. Assignment of school buses to schools. Uniform budget format. Conveyance of school property upon enlargement of city administrative unit. Acquisition of sites. Disposition of school property; easements and rights-of-ways. Deeds to property. Erection of school buildings. Provisions of equipment for buildings. Repair of school property; use of buildings for other than school purposes.

Chapter 130A. Section	130A-236. 130A-237. 130A-317. 130A-320. 130A-335.	PUBLIC HEALTH Regulation of sanitation in schools. Inspection, reports, corrective action. Department to provide advice; submission and approval of public water system plans. Sanitation of watersheds; rules, inspection. Sanitary sewage collection, treatment and disposal; rules.
Chapter 136. Section	136- 181(17).	ROADS AND HIGHWAYS Powers of Department of Transportation.
Chapter 143. Section Article 3 Article 21 Section	143-138. 143-214.7	STATE DEPARTMENTS, ETC. North Carolina State Building Code, Department of Insurance. Department of Human Resources. Department of Natural Resources and Community Development. Designated Parking areas not to exceed 80% built-upon area. Remaining area shall meet permeable pavement system requirements.
Chapter 159. Section	159-18.	LOCAL GOVERNMENT FINANCE Capitol reserve funds.
Chapter 160A. Section	160A-274.	CITIES AND TOWNS Sales, lease exchange and joint use of governmental property.

Administrator's Handbook for School Transportation

Division of Transportation Controller's Office, N.C. Department of Public Education, 1976.

Architectural GRAPHIC Standards, Eleventh Edition The American Institute of Architects, March 2007.

FACILITY PLANNING for Physical Education, Recreation, and Athletics American Alliance for Health, Physical Education, Recreation and Dance, 1993.

The CEFPI Guide for Educational Facility Planning

The Council of Educational Facility Planners, International, 2004.

Public Playground Safety Handbook

U.S. Consumer Product Safety Commission, Washington, D.C., April 2008.

National Federation Court and Field Diagram Guide

National Federation of State High School Associations, 2008.

North Carolina Public Schools Facilities Guidelines

A Guide for Planning School Facilities

School Planning, N.C. Department of Public Instruction, September 2003

Public School Laws of North Carolina The State Board of Education, October 2009.

School Site Problems and Solutions

Volume 31, Number 6, 1993, The Council of Educational Facility Planners, International.

SCHOOL SITES Selection, Development, and Utilization

Special Publication No. 7, 1958, U.S. Department of Health, Education, and Welfare.

SCHOOL SITES: Selection, Development and Utilization

Educational Facilities Series, A Guide to Planning, New Jersey State Department of Education, 1973.

Site Design Graphics

Michael S. Kendall, 1989.

Standard Consumer Safety Performance Specification for Playground Equipment for Public Use American Society for Testing and Materials, Designation: F 1487 – 07ae1.

The Secretary of the Interior's Standards for Rehabilitation and Guidelines for *Rehabilitating Historic Buildings*

U.S. Department of the Interior, National Park Service, 1990.

Revised– February 2010 School Planning Division of School Support Financial and Business Services Public Schools of North Carolina