



Selecting and Siting K-12 Schools in a Community

By David Henebry, AIA NCARB ALEP

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The traditional process of locating schools has consisted simply of mapping attendance areas and meeting with realtors to discuss and choose an available property. Today, however, due to a stronger understanding of the socioeconomic impacts of the development of schools on communities, there is a desire to explore a smarter approach to identify sites for schools. The objective of this essay is to provide a comprehensive, long-term strategic approach for siting schools in growing communities. Now that we have a stronger understanding of the socioeconomic impacts of development on communities, we want to explore a smarter approach to identifying sites for schools. This paper is focused on a comprehensive long term strategic approach to identifying sites for schools in growing communities.

When determining the right location for a school, each community has differing needs based on its demographics, geography, and population density. All communities evolve over time, so the relevance of some school locations may change. One community may be looking at consolidating schools due to reduced enrollments, while another district may be experiencing rapid growth. The information contained in this article is based on the majority of communities that are targeting school sizes ranging between 450-650 student elementary/K-8 schools, 600-1200 student middle schools, and 800-2000 student high schools. For those districts looking at smaller or larger schools, most of the principles discussed will apply. An Accredited Learning Environment Planner and Urban Planner should be included on the team for professional guidance in analyzing the options. It is also advisable to develop an education specification/facility program (Ed Spec)¹ developed according to the school districts pedagogy for each building type; examples include elementary Ed Spec, middle school Ed Spec or pre-

¹ **Education Specification (Ed Spec)** *An Ed Spec is a facility program developed to define the special programmatic needs constructed around the school districts pedagogy and various other goals and initiatives.*

K-8th grade Ed Spec and high school Ed Spec. This process will identify critical criteria that will be needed to do a comprehensive site analysis.

Working with the Local Community

School districts are typically the largest, or one of the largest, land owners within a community. Judicious planning and strategy should be adopted by each school district and community for either long term acquisition goals or for sustainable land management practices and Smart Growth² planning. Due to the acreage requirements and need of large sites, school districts attract greater scrutiny for storm water management and impacts on traffic patterns from municipalities and ecological groups. Accordingly, a strong understanding of the available infrastructure should also be factored into the decision making. Two sites that comparatively make sense from a location standpoint may have very different impacts on the area based on available infrastructure. A number of municipalities, whether they be correct or incorrect, will look to the school district as an opportunity to solve infrastructure issues near the site, thus reducing available funds for education environments. These issues may also affect the acreage required to execute a quality solution. Associated issues can become polarizing with the general public if not managed well. If a referendum is required, the judicious execution of selecting a site can build the community's confidence, resulting in the trust necessary to pass a referendum. It is much easier to sell a referendum if the due diligence of a good process has been thoroughly completed.

The Benefits of a School's Adjacency to a Park

² **Smart Growth** describes a collaborative approach to town and city design and restoration. Its principles emphasize issues of transportation and public health, environmental and historic preservation, sustainable development, and long-range planning.

There are some natural adjacencies³ and partnerships that should be explored. Proximity to parks, community centers, transportation nodes/stops, libraries, etcetera that may provide opportunities for efficiency, opportunity and convenience. Parks have been strong traditional partners for sharing resources and facility support. Parking alone can have a huge mutual financial benefit. Since parks have low utilization during school hours and greater utilization after the school day ends, parking utilization efficiencies are a natural benefit. This also lessens the acreage required for both the park and the school and reduces the carbon footprint⁴ associated with parking by reducing the heat island effect⁵ within the city. Many of the afterschool activities are associated with outdoor sports and provide walkable access from school to afterschool activities. The benefit of walkable solutions contributes significantly to reductions in congestion and parents' schedules for chauffeuring their children from place to place. Similar benefits are shared with proximity to community centers that provide after school programs. Schools also provide an ideal and secure location for meeting programmatic space needs for park districts and community groups after school-hours and into the evenings. Some districts have provided meeting space allocation for the park district in return for lawn and landscaping maintenance from the park district. The gained efficiencies of shared utilization of land resources provides more funds for operation expenses, thus reducing pressures of a local tax burden. For the brightest

³ **Natural Adjacency** describes the natural mutual benefits of location. Example: "Parks/Schools," "Convention Center/Hotels/Parking Structures," etc.

⁴ **Carbon Footprint** The total amount of greenhouse gases produced to directly and indirectly support human activities, usually expressed in equivalent tons of carbon dioxide (CO²)

⁵ **Heat Island Effect** – The heat island effect occurs when pavement or hard surfaces absorb heat from sunlight and releases the heat back into the atmosphere. With urban concentrations of hard surfaces radiating heat in a cumulative manner, the causal effect is an elevated outdoor temperature compared to adjacent rural or natural areas.

communities, this is an important long-term positioning strategy for gaining the edge in attracting the best talent, especially for communities focused on a knowledge based-economy.

The Effect of a School's Location on Traffic Patterns

Introducing a new school into a community has a significant effect on traffic patterns.

Understanding the traffic patterns and the causal shift of adding a school to the area should be factored into this decision as a school will generate traffic surrounding its location due to parents dispersing to either work or home. Placing a school where it has a single or isolated vehicular access can create issues of congestion and affect safety for both drivers and pedestrians when both school buses and automobiles converge. Where possible, locate schools where alternative transportation options are available to reduce congestion and where there are multiple approaches to the site to disperse the traffic more smoothly. Judicious placement of schools can strengthen the tax base that School Districts depend on for financing operations, as described in Volume 40 of *Local Governments and Schools: A Community-Oriented Approach*:

The tax base of existing neighborhoods is primarily driven by the perceived reputation of the neighborhood. This has a direct impact on property values, which affects the quality of the community's overall tax base. "It has long been accepted that the quality of local schools influences property values. But research indicates that the location of local schools does, too. An analysis of two neighborhoods in Jackson, Michigan for example, found that the average property value of homes within a half mile of an 'open, stable' elementary school rose at a higher rate than that of homes within a half mile of a closed school. The analysis estimates that had the closed school remained open, the city, county, and school district would have received approximately \$2 million more in property taxes over 10 years (6).

Balancing the Proximity of a School to a Neighborhood

When implementing Smart Growth strategies it is imperative to effectively locate schools in such a way that economic viability of neighborhoods is sustained. Evidence exists on how investing in existing schools and locating new schools can affect or create segregation.

Social Equity

The socioeconomic makeup of neighborhoods is reflected in a community's schools, and has important implications for academic equity.

The construction of newer schools on the edges of established cities and towns contributes to the socioeconomic segregation of both communities and schools. As discussed earlier, families with means tend to move closer to new or suburban schools, leaving lower-income families behind. Furthermore, neighborhood-based schools tend to be segregated, because the neighborhoods they serve are segregated. When schools are segregated, school quality and academic performance in impoverished neighborhoods decline. Studies show that the socioeconomic composition of a school has a substantial impact on education, particularly for poor children. As one expert states, outward migration “leave[s] urban schools with fewer resources, material or intellectual, to serve communities of increasing levels of concentrated poverty” (Local Governments 6).

Smart Growth Planning and Environmental Impact

Each community should adopt a Smart Growth plan. The location of a school can positively or negatively affect the impact sustainability ⁶and carbon footprint of any community. How a school is

⁶ ***Impact Sustainability*** describes the impact of development patterns on financial or ecological viability within a community.

integrated into the urban fabric and traffic grid can impact miles travelled, traffic patterns, walkability⁷, and safety. The United States Green Building Council (USGBC) LEED for Schools 2009 outlines criteria for site selection and focuses on walkable solutions with access to transit systems, bike routes, and alternative transportation options. LEED for schools also places a preference for not siting schools on productive farmland, wetlands, preserved or sensitive habitat, and undeveloped land. New school construction historically has proven to drive investment. If the school is located beyond the edges of the city, it tends to drive urban sprawl, as families wish to live closer to the preferred school. When located within a community, it can generate urban renewal for the surrounding neighborhoods. Communities should have Smart Growth plans developed with the following attributes identified:

- Demographic

Residential Populations -Student Population density map (Current/Projected)			
Mixed-Use	Commercial	Industrial	Defined Neighborhood

- Traffic Patterns

Pedestrian	Transit	Automotive	Industrial
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- Schools

Existing Public Schools	Proposed Public Schools
Existing Private Schools	Proposed Private Schools

⁷ **Walkability** is a measure of how friendly an area is to walking.

- Public Libraries

Existing Libraries	Proposed Libraries
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- Parks

Existing Parks including type	Future Parks including type
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- Existing Critical Response Facilities

Police Stations	Fire Stations	Hospitals	EMT/Ambulance
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- Transit

Existing Transit Routes & Type	Future Transit Routes & Type
Existing Transit Stops	Future Transit Stops

- Pedestrian Sheds⁸

5 Minute Walking Distance from each key pedestrian access destination.	10 Minute Walking Distance from each key pedestrian access destination.
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**Note that some schools and critical response facilities may be targeted for consolidation. This should be reflected in the planning documents.*

⁸ **Pedestrian Shed** is a map of an area based on a 5 minute/quarter mile and 10 minute/half mile pedestrian travel distance

If a long term school location plan based on Smart Growth patterns does not exist, a plan should be developed. A community should begin by creating an advisory or steering committee; this committee should include school district leadership, education facility planners, urban planners, city planning, selected school board members, parents, business leaders, transit authority, and potential partner organizations such as parks, libraries, and recreation and community centers.

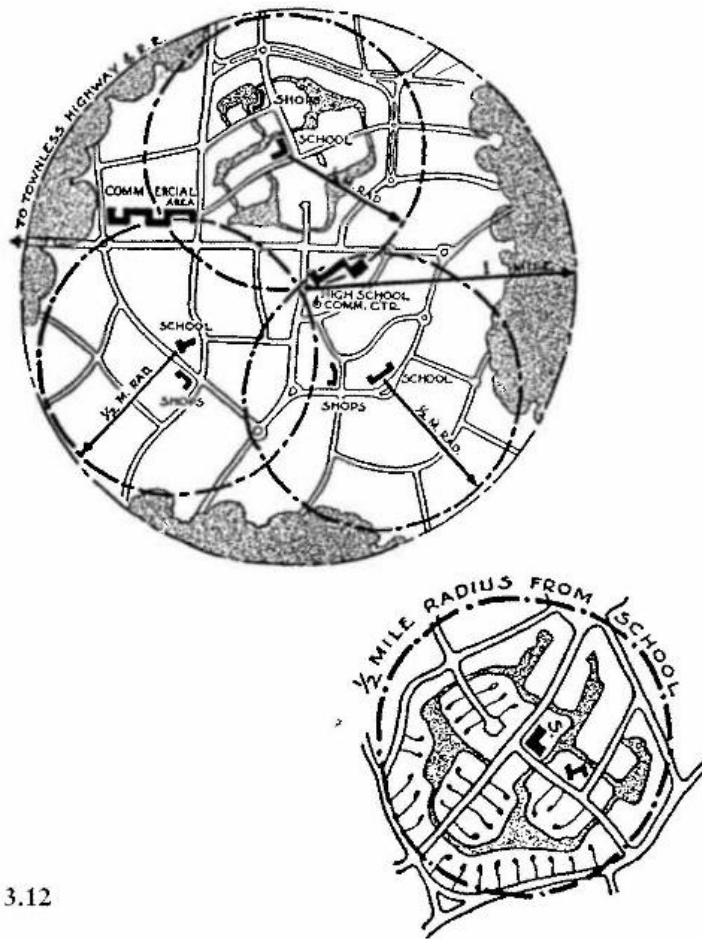
Benefits to the Population

The planning documents should provide sufficient information to identify areas of sufficient or insufficient facilities to support the population. Before responding directly to the current existing data, it should be noted that the demographics and gentrification of a neighborhood will change considerably over a timespan of fifty years. This is typically why elementary/pre-K-8/middle schools should be located centered between two to three neighborhoods. As the demographics of the various neighborhoods morph, the supporting population shifts should balance out, maintaining the viability of the school location. These also become centralized community centers serving a broader population and, with the efficiencies of size, can provide more diverse opportunities within the facility for community services; community clinics, community meeting space and adult education spaces are such examples. High schools tend to be very disruptive to neighborhoods due to the large attendance of major events and athletics and are best located on secondary artery streets at the outer edges of neighborhood districts.

Pedestrian Walking Distance: Bridging the Gap

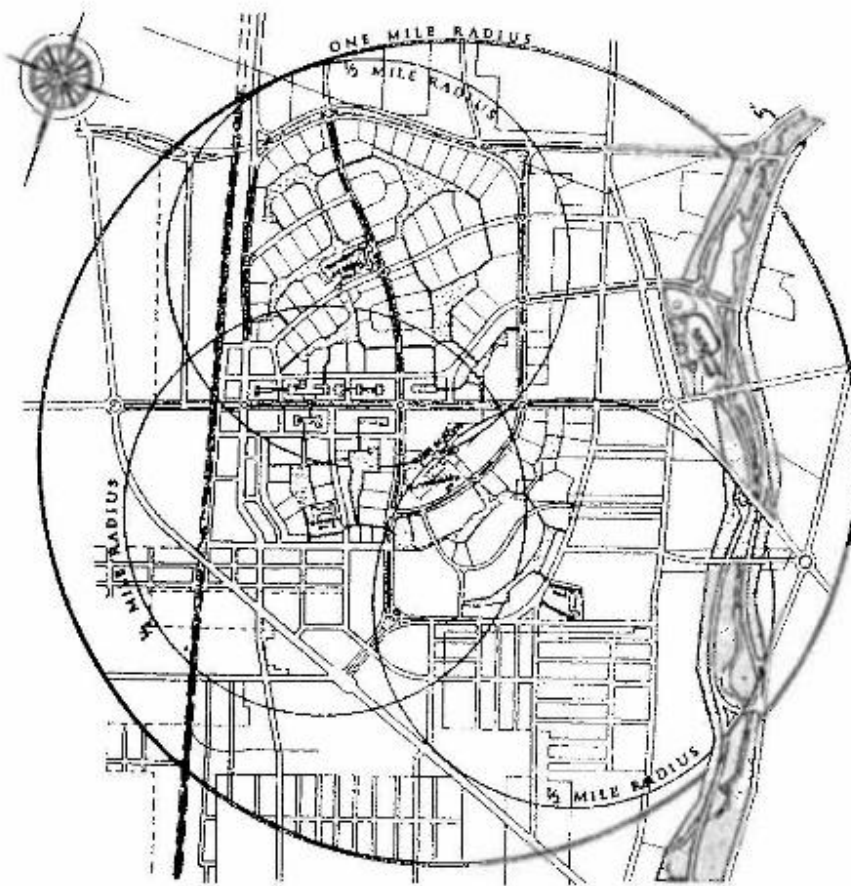
Both the Clarence Stein diagram (Illustration 3.12) and the Radburn, NJ diagram (Illustration 3.16) by Clarence Stein and Henry Wright are based on pedestrian walking distances. The success of these today would be dependent on the population density of a community. With low density suburban residential developments, it would be difficult to obtain the students necessary to populate a school

without exceeding the half-mile radius. Schools should be placed in a way that encourages safe pedestrian access. Studies of population densities, including anticipated growth, should be conducted to determine where the greatest pedestrian shed is. This study should be overlapped with traffic patterns to determine the safest location for the school.



3.12

3.12 Clarence Stein in 1942, thirteen years after the Neighborhood Unit of Clarence Perry, prepared this diagram also for the Neighborhood Unit. The former proposed a quarter mile pedestrian shed, while Stein proposes a half-mile walk from edge to center. Both models have a school at their cores. Perry's diagram begins to breakdown the capillary network of thoroughfares into super blocks. This represents the beginning of suburban sprawl. AMD



3.16

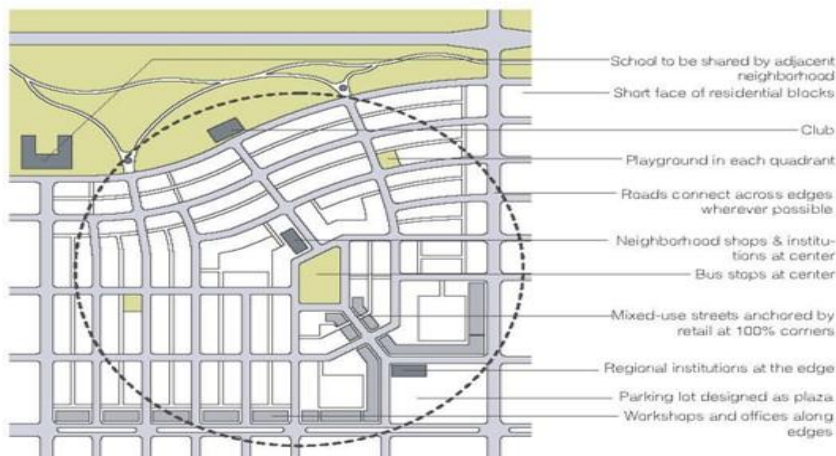
3.16 This is the complete plan of Radburn, New Jersey, as prepared by Clarence Stein and Henry Wright, ca. 1928. This is the full regional diagram of the Radburn system showing how each super block is a quarter mile from edge to center and a cluster of four generates a neighborhood center. The one-mile radius designates catchments for a high school and the single town center. Whatever the merits of the Radburn system, these formulations continue to be generally valid, as they are based on the limits of the human desire to walk. Thus, the quarter mile radius is the more rigorous standard. AMD

Assuring Student Population

The diagram for “Traditional Neighborhood Development” below places the school at the edge of the neighborhood, recognizing that most communities lack the residential density to sustain an adequate

student population required to efficiently operate a school. Each community has a varying density demographic that has to be researched to provide a balanced feeder area for a given school. To reduce auto dependence, attention should be given to bike and mass transit routes to reduce the number of automobiles accessing the school site.

TRADITIONAL NEIGHBORHOOD DEVELOPMENT 1997



Traditional Neighborhood Development: A diagram that reconciles current urbanization models with the traditional Neighborhood Unit.

Each thoroughfare and Civic Open Space must constitute or be part of an immersive environment. Such environments are shaped by the buildings surrounding them, and are organized by Transect zones. The Transect zones ensure that each portion of the public realm is consistent in itself, and the thoroughfare network ensures that they make a whole.

The school is placed no longer at the center, but at the edge as playing fields would hinder pedestrian access to the center. At the edge, the school can be shared by several neighborhoods, mitigating the problem of the tendency of neighborhoods to age in cohorts, generating large student-age populations that then drop off sharply.

There are a few sites reserved for local institutions at the center and more for regional institutions at the edge. Ease of transportation has made membership in institutions a matter of proclivity rather than proximity.

The shops at the busiest intersections have been modified to accommodate larger parking plazas for convenience retail and extended by an attached Main Street for destination and live-work retail. More service alleys and lanes have been added to accommodate the increased parking requirements.

The minor thoroughfares are connected with those outside the neighborhood in order to increase permeability and disperse traffic. This modification, however, increases the possibility of shortcuts.

The thoroughfare types support a transect from rectilinear streets at the urban center to curvilinear roads toward the rural edge.

The traffic along the boulevards at the edges is more unpleasant than Clarence Perry envisioned. Three mitigating strategies are proposed: the provision of an end-grain of blocks at all edges, a green buffer shown along the bottom edge, and the location of resilient building types, such as office buildings, shown along the bottom edge.

The traffic along the highway shown at the top is assumed to be hostile and therefore buffered within a parkway.

Image Courtesy of DPZ Partners LLC

Pedestrian Safety

Images: Bicycle Lane, Calming Strip crosswalks, etc.



Images show the use of identified pedestrian paths. Studies have shown that changes in the surface texture tend to slow traffic.

Most school districts are required to provide safe route plans to governing authorities. This should be used as a tool when analyzing location options. Typically this will parallel well with walkable and bicycle friendly neighborhoods. Additional considerations include:

Good network of sidewalks along all routes	Condition of sidewalks and bike lanes
2 lane streets with street parking	Bike lanes
Good sight lines (no blind spots) for easy passive monitoring	Clearly marked crosswalks (Traffic calming brick pavers at crosswalks are highly recommended)
30 mph or less posted speed limits.	

Once a site has been selected, the site should accommodate separate bus drop/pick up zones for bus traffic, student drop-off, and staff parking with as little cross-over as possible.

Overall Safety of Location

Additional safety considerations should be explored to confirm the relative safety of the location. Depending on the community or region, the following considerations should be explored, some of which can have a detrimental effect on the budget for stabilization and/or structural design. The following should be checked and analyzed for potential threats for safety:

- **Seismic Zones**

Identify known Faults or Fault Traces ⁹
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- **Flood Zones**

Potential for threats from flooding

Avoid locating schools in Inundation areas – (Downward of Dams or dam-like structures)
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- **Mud Slide**

Avoid areas prone to rock or mud slides

Is cost of stabilization prohibitive?

- **Hazardous Waste or Solid Waste**

Determine what exists within the community and assess the safe distance for the specific hazard as well as know the prevailing winds.

⁹ ***Fault Traces*** are the intersections of a geological fault with the ground surface.

- High Pressure Gas Lines and High Voltage Lines

Locate site a minimum of 1500 feet from high pressure gas and high voltage electrical lines.

CPTED Principles:

Crime Prevention Through Environmental Design (CPTED) places an emphasis for natural surveillance. The approach to the site and entry of the school should allow for effective site lines, favoring sites where the school can be set back from the public way to provide sufficient distance to observe and assess a potential threat. Some high density urban sites will need to implement other strategies. All traffic from pedestrian, bus/car loading unloading, visitor parking and deliveries should be visually monitored. The selected sites should provide for natural situational awareness.

Avoiding Noise Pollution

Acoustic considerations should be factored in when selecting and siting the schools. Vehicular noise, associated with high traffic areas or highways, should be avoided. Proximity to airports should be considered, with the exceptions being aviation-themed schools that are functioning in collaboration with the airport. Rail-noise and vibration can be stressors and distracting for students and educators alike. Industrial activity can have similar effects on school populations as well as safe pedestrian access to the site. Research the neighborhood and zoning of surrounding properties before finalizing the site selection.

Schools and Sense of Community

Schools provide a stabilizing presence within a community. Whether living in a small town or a large municipality, that sense of identity as a community is defined by the presence of religious institutions and schools. They become the place that is central to our daily activity. Decisions regarding

the addition or removal of a school require careful consideration, informed by a community engagement process. The process should have 4 very important components:

- The “Why” - educate the community on why it is being considered.
- “Listen” - hear what the community concerns are and why they are concerned.
- “Explore Solutions” - work with the community to determine if there is a common ground that can be achieved in locating a school.
- “Final Resolution” - share the final decision and rationale for the decision making process.

In most planning efforts, the community is generally very supportive when engaged in the process; furthermore, allowing the community to participate in the planning of a school typically develops trust and respect for the decisions at hand. Greater consensus is achieved by open participation than non-participatory efforts, while also establishing the beginning point for growth in the community. Do note that, though the process generally creates consensus in some efforts, there is often 5% percent of the population who will dislike any decision that is made, and it is important to recognize that this particular group may be rather boisterous in their opinions. Be professional, polite, and listen, but do not abandon the process. Remain focused on the goals. The primary purpose of the engagement process is to listen and explore options. In most cases, the solution will have broad approval; in some rare instances, the correct solution may have to be pursued in conflict with those who are very vocal. Never fear going with what you know to be the best solution for the long term. The public generally has a short memory and if the location proves to be successful in the end, most people will forget the opposition to the decision. The key is allowing engagement and presenting a sound rationale. Without these two components, a referendum will likely fail. You will find that the majority is with you and not against you; people have a tendency of abstaining from meetings when they are in agreement.

Calculating Necessary Space

A common question in all school siting efforts relates to the amount of acreage actually needed. Council of Education Facility Planners International (CEFPI) has published recommended standards for acreage by school type and size. Keep in mind that you should go through a community workshop process to determine what should be included on the site. This should be part of the Ed Spec development that was mentioned earlier. For example, a community that is expecting four soccer fields with an elementary school will require considerably more acreage. Work with a Certified Education Facility Planner to guide you to the best answer for each project. The published standards are recommendations based on averages from previously constructed projects. It is important to note that some states have mandated standards that should be obtained and reviewed prior to purchasing a site. It is also important to note that you need to have the architect or the Certified Education Facility Planner test fit site solutions. There are excellent examples of completed projects on sites with fewer acres referenced in the proposed standards.

In general:

Elementary

10 Acres + 1 acre for each 100 students

What is included within the acreage: school building, bus drop off/pick up, parent drop/pick up, staff/visitor parking, storm detention ¹⁰ basin, playground, hard surface play area, (1) baseball/softball field and a large grassy area or soccer field
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¹⁰ **Storm Detention** is a reservoir, dry pond, on site storm water storage facility intended to retain storm water runoff that is released at a controlled volume to prevent flooding and downstream erosion.

Middle School

20 Acres + 1 acre for every 100 students
What is included within the acreage: school building, bus drop off/pick up, parent drop/pick up, staff/visitor parking, storm detention basin, hard surface play area, (2) baseball/softball field's, a large grassy area or soccer field

High School

30 Acres + 1 acre for every 100 students
What is included within the acreage: school building, bus drop off/pick up, parent drop/pick up, staff/visitor/student parking, storm detention basin, hard surface play area, (2) baseball/softball field's, track/football field and a large grassy area or soccer field

Other factors in determining acreage requirements include topography, storm detention, recreation or sport fields, urban/suburban/rural contexts, etcetera. Be sure a comprehensive evaluation of what will be on the site has been determined and tested prior to purchasing the lot. Inadequate research and exploration will generally result in unnecessary compromise.

In Closing...

Traditionally, school siting has been simply a review of available property inventory and selection of the best from the available properties. When reviewing all of the factors for properly siting schools and the long term impacts that will result for the community, it is vital to develop long-term strategies. The volume of land needed creates substantial challenges when identifying exceptional locations for schools. Judicious long-term planning utilizing Smart Growth strategies in collaboration with city planners,

education facility planners, and the community, can mitigate some of the negative impacts of school closures or poorly located schools. Selecting the right site may require more initial funding and potentially even land banking¹¹ and property swaps¹², which are more complicated to execute but provide a more sustainable long term solution for the school district and community. As an educated society, we expect more. Therefore, a shift from the status quo to smart and sustainable planning through community collaboration should be the expectation.

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¹¹ **Land Banking** the acquisition of properties over a period of time for the purpose of development as the properties become available on the market. Example: A school may identify a city block needed for a school to be constructed in the distant future. As each home is placed on the market over a period of decades the properties would be secured by a shell corporation for the purposes of strategically acquiring the necessary land to construct a school.

¹² **Property Swaps** in lieu of exchanging funds for the purchase of land deeds for equal valued land are swapped. Example: A Park District may be willing to swap 8 acres of an existing 60 acre park for equal value of land purchased by the school district within the community that they may need to achieve their long term strategic goals.