



1. About the School Siting Guidelines

In December 2007, Congress enacted the Energy Independence and Security Act (EISA).¹ Among the provisions included in the Act was a requirement that the U.S. Environmental Protection Agency (EPA) develop, in consultation with the Departments of Education and Health and Human Services, model guidelines for the siting of school facilities that take into account:

1. The special vulnerabilities of children to hazardous substances or pollution exposures in any case in which the potential for contamination at a potential school site exists;
2. The modes of transportation available to students and staff;
3. The efficient use of energy; and
4. The potential use of a school at the site as an emergency shelter.

In carrying out this statutory mandate, EPA has developed voluntary School Siting Guidelines that will encourage, inform and improve consideration of environmental factors in local school siting decision-making processes without infringing on local decision-making authority. EPA's overarching goal for the guidelines is to serve children, staff and the broader community by:

Supporting states, tribes, communities, local officials and the public in understanding and appropriately considering environmental and public health factors when making school siting decisions;

- Encouraging meaningful, broad and inclusive community involvement to ensure community understanding, input and engagement in school location selection;
- Encouraging comprehensive evaluation of prospective locations for their potential positive and negative impacts on the health and safety of children and school workers and on the environment;
- Identifying opportunities to promote environmental justice in how school siting decisions are made;
- Encouraging decision makers, where appropriate, to examine existing schools and the potential for renovation, upgrade, adaptation and expansion before concluding new school construction is warranted;
- Encouraging decision makers, where appropriate, to examine nearby environments in low-income, minority, indigenous and other overburdened communities;
- Demonstrating how well-located schools can allow more students, faculty and staff to walk, bike and/or use public transit to get to and from school;
- Identifying opportunities to serve multiple community purposes (e.g., emergency shelters, community centers, joint school and public libraries, gymnasiums, playing fields, theaters and community gardens) so that schools can become a hub for the whole community; and

¹Energy Independence and Security Act of 2007, Public Law 110-140, HR6, 110th Cong., (December 19, 2007). Available at: www.govtrack.us/congress/bill.xpd?bill=h110-6.

- Encouraging decision makers to consider short- and long-term construction, transportation and operation and maintenance costs and benefits in design and construction decisions.

1.1. Who Should Use the Guidelines?

These voluntary guidelines are intended to assist local school districts, which will be referred to throughout these guidelines as the local education agency ([LEA](#)) (see Section 10), and community members in evaluating environmental factors to make the best possible school siting decisions. The special vulnerabilities of children and considerations for children's health underpin the recommendations contained in these guidelines, consistent with EISA, Subtitle E—Healthy High-Performance Schools, Section 502. While the guidelines are primarily intended to be used by LEAs in evaluating and selecting locations for K-12 schools, EPA believes that the recommendations in the guidelines represent a set of best practices that inform and improve evaluation and selection decisions for a wide range of settings where children spend time. Although there are many differences in how locations are chosen across the types of child-occupied facilities, the practices recommended within the guidelines may be applied, with appropriate adaptation, to a wide range of school-related institutions, including:

- K-12 public schools (including charter schools and schools in leased locations);
- K-12 private schools;
- K-12 schools operated by the Department of Defense or Department of the Interior's Bureau of Indian Education;
- Technical and vocational schools;
- Colleges and universities; and
- Pre-K and non-home child care, after care and early learning settings (e.g., Head Start and Early Head Start programs).

The guidelines are intended to be used prior to:

- Making a decision about whether to renovate the existing school, build a new school on the current site or build a new school on a new site;
- Acquisition of land for school facilities;
- Use of legacy property already owned by the LEA;
- Leasing of space in new or existing structures not owned by the LEA for use as a school; and/or
- Major repair, renovation or reuse of existing properties and structures already owned by the LEA for use as a school.

1.1.1. Evaluation of Hazards

Throughout these guidelines, references are made to chemical hazards, contaminants, toxic substances and other terms that identify chemicals and compounds that may pose risks to students, staff, parents and others. The use of any of these terms is not intended to be limited to a statutory or regulatory definition. The intent of these voluntary guidelines is to provide a process for the assessment of chemicals, compounds or other materials that pose a threat to anyone that spends time in the school environment at candidate locations for schools.

1.2. Limitations of the Guidelines

Decisions on school siting are complicated and in many instances will involve issues where there are scientific and technical uncertainties. Generally, state, tribal and local governments decide where to locate schools. With few exceptions (e.g., a school located on a Department of Defense base or funded and/or operated by the Bureau of Indian Education), the federal government does not have authority over school siting decisions.

While EPA does not have the statutory authority to control school siting decisions directly, it

administers federal environmental laws that may apply to or be relevant to location evaluation, including site assessment and cleanup. In many cases, states have similar authorities to address site cleanup, and some states and tribes also have additional authorities (e.g., certain land use authorities) that may be relevant to school location decisions. No single set of national guidelines can reflect the widely divergent situations and institutional relationships that exist throughout the education system in the United States. Because each state, tribe and community has or will develop their own location evaluation and selection procedures, the recommendations contained in EPA's School Siting Guidelines are designed to provide a general guide that should be adapted to local situations.

The guidelines are designed to support state, tribal and community decision makers in evaluating their existing school processes and policies to address environmental factors in school siting and construction decisions, especially when the presence of contamination may pose a threat to a safe learning environment. These guidelines do not impose legally binding requirements on EPA, states, tribes, local governments, LEAs or the regulated community, and may not apply to a particular situation based upon the circumstances. **These guidelines do not pre-empt, supersede or serve as a substitute for state, tribal or local school site or location selection policies or requirements.**

Economic, racial and ethnic segregation is a continuing challenge across the country. More diverse schools can provide educational as well as life attainment benefits to all school age children.² While community centered schools can be part of improved educational, economic, community and public health outcomes for children, families and

² Gary Orfield and Chungmei Lee, "Historic Reversals, Accelerating Resegregation, and the Need for New Integration Strategies," The Civil Rights Project, University of California Los Angeles, August 29, 2007. Available at: <http://civilrightsproject.ucla.edu/research/k-12-education/integration-and-diversity/historic-reversals-accelerating-resegregation-and-the-need-for-new-integration-strategies-1/orfield-historic-reversals-accelerating.pdf>.

neighborhoods, LEAs should balance these issues with meeting the goal of diverse school populations. Techniques are available to help achieve the multiple goals of diverse student populations and schools located within the communities they serve. The Resources page of the guidelines website (www.epa.gov/schools/siting/resources.html#Links_Technical_Assistance) contains information about techniques that have been identified to support these goals. While these issues are beyond the scope of these guidelines, the Resources page of the guidelines website also contains links to select studies on school segregation trends and causes. (www.epa.gov/schools/siting/resources.html#LINKS_Segregation)

It is beyond the scope of these guidelines to discuss the requirements of federal civil rights laws that apply to public school districts and may be relevant to school siting decisions. These civil rights laws include Title VI of the Civil Rights Act of 1964 (www.justice.gov/crt/cor/coord/titlevi.php), which prohibits discrimination on the basis of race, color or national origin in federally assisted programs or activities. EPA's regulations implementing Title VI prohibit both intentional discrimination and facially neutral policies and practices that result in discriminatory effects, including siting decisions.³

³ EPA's Office of Civil Rights and the Department of Education's Office for Civil Rights are available to provide technical assistance to districts concerning applicable civil rights laws. See agency regulations implementing Title VI, for example, EPA's Title VI regulations, 40 C.F.R. Part 7, and the U.S. Department of Education's Title VI regulations, 34 C.F.R. Part 100. The Title VI regulations prohibit, among other things, race, color or national origin discrimination in siting decisions. In addition to prohibiting discrimination in siting decisions, among other things, the civil rights laws establish other requirements relevant to the decision-making process, such as requirements pertaining to effective communication with limited English proficient persons and individuals with ties and requirements pertaining to access by individuals with disabilities. See U.S. Department of Justice regulations implementing Title II, 28 C.F.R. Part 35, and Title III, 28 C.F.R. Part 36, of the Americans with Disabilities Act, and U.S. Department of Education's regulations implementing Section 504 of the Rehabilitation Act of 1973, 34 C.F.R. Part 104.

IMPORTANT: The School Siting Guidelines are NOT designed for retroactive application to previous school siting decisions. They are designed to inform and improve the consideration of environmental factors in the school siting decision-making process going forward. In developing these guidelines, EPA seeks to strengthen information exchange and cooperation between LEAs, state and tribal education agencies and their environmental counterparts to better serve school children, parents, staff and their communities in providing safe school environments. Many schools across the country may be located in proximity to one or more of the potential hazards discussed within the guidelines. Due to many factors that affect exposure to environmental hazards (such as those included in [Exhibit 5](#)) and based on the regulations and protective measures that can be applied, proximity of a school to nearby sources of environmental contaminants may not pose unacceptable risks. EPA recommends that districts periodically inspect existing schools for potential environmental health and safety risks using tools designed for that purpose such as EPA's Healthy School Environments Assessment Tool (HealthySEAT; www.epa.gov/schools/healthyseat/) or the National Institute for Occupational Safety and Health (NIOSH) Safety Checklist Program for Schools. (www.cdc.gov/niosh/docs/2004-101/) Where deficiencies are found, EPA recommends [steps to reduce student and staff exposure to potential hazards](#) be identified and implemented (see Section 9.13). Keeping children safe from environmental exposures at school does not end with site selection, or even materials selection during construction; the health of students and staff in schools is supported by an ongoing attention to commitment to healthy school environments. EPA has a considerable body of guidance and regulations that are specifically geared toward existing schools, which is available at www.epa.gov/schools.

1.3. Public Involvement in the Development of the Guidelines

In July 2009, EPA convened a special School Siting Task Group (Task Group) under the existing Children's Health Protection Advisory Committee (CHPAC) to provide early input to EPA on the content of the siting guidelines. (http://yosemite.epa.gov/ochp/ochpweb.nsf/content/whatwe_advisory.htm) The Task Group was composed of representatives from a wide range of national, state, tribal and local organizations. The Task Group was provided with an initial draft and provided comments (http://yosemite.epa.gov/ochp/ochpweb.nsf/content/CHPAC_Comments.htm#14) in April 2010 to EPA in the form of a letter from the CHPAC to Administrator Lisa Jackson (April 7, 2010) (http://yosemite.epa.gov/ochp/ochpweb.nsf/content/CHPAC_School_Siting_Letter_web.htm) and a report from the School Siting Task Group. ([http://yosemite.epa.gov/ochp/ochpweb.nsf/content/CHPAC_SSTG_Report2.htm/\\$File/CHPAC_SSTG_Report2.pdf](http://yosemite.epa.gov/ochp/ochpweb.nsf/content/CHPAC_SSTG_Report2.htm/$File/CHPAC_SSTG_Report2.pdf)) EPA appreciates the work of the Task Group and the contributions made by all of its members. EPA incorporated many of the recommendations from the CHPAC letter and School Siting Task Group report into the guidelines.

In November 2010, EPA released the draft School Siting Guidelines for public comment. The comment period was open until February 2011. EPA considered these comments in revising the guidelines. A summary of the issues raised by the public commenters and EPA's responses can be found on the Public Involvement in the Development of the guidelines page. (www.epa.gov/schools/siting/development)

In addition, the guidelines have drawn from, and the Resources page of the guidelines website includes links to, numerous resources that have already been developed by state and local jurisdictions and other organizations. (See: www.epa.gov/schools/siting/resources)

1.4. Principles behind the Guidelines

1.4.1. Principle 1. Safe and healthy school environments are integral components of the education process

The overriding purpose of a school building is to provide a safe, healthy and supportive environment in which children can learn. Children spend nearly a third of their typical day in the school environment, where they may be exposed to a range of contaminants both indoors and out. Such exposures can impact health and learning and negatively impact school attendance. Student exposure to environmental hazards at school can arise from multiple pathways, which may differ between locations. Each location may have different underlying causes of potential exposure, such as site contamination, neighborhood emission sources or indoor air quality problems. (<http://yosemite.epa.gov/ochp/ochpweb.nsf/frmchemicals>)

Poor indoor air quality can contribute to illness resulting in absence from school and acute health symptoms that decrease performance while at school.⁴ Poor indoor air quality may also directly reduce a person's ability to perform specific mental tasks requiring concentration, calculation or memory. Although children spend most of their school day inside the school building, they also spend time outdoors, such as during recess, physical education class, physical activity outside of class time and getting to and from school. Examples of contaminants that can be found in outdoor school environments include air pollution from motor vehicles, pesticides and industrial pollutants. Some of these pollutants also

⁴ U.S. Environmental Protection Agency, "Indoor Air Quality and Student Performance," U.S. Environmental Protection Agency, Washington, DC, EPA 402-F-00-009, August 2000.

contribute to exposures within the indoor environment in schools.⁵

Children are more vulnerable to environmental exposures because their responses to toxic substances, both in severity and in the nature of the adverse effect, can differ markedly from those of adults.⁶

- Children breathe more air, drink more water and eat more food per kilogram of body weight than adults;
- Children's behaviors (e.g., hand to mouth contact) also make them more susceptible to environmental hazards, especially hazards in soil and dust;⁷
- Children experience periods of growth and development which can be adversely affected by exposures to toxic substances. The rapid development of a child's organ systems during embryonic, fetal and early newborn periods makes children vulnerable when exposed to environmental toxicants. The particular vulnerabilities of infants, preschool and young children may be of particular importance to consider where child care centers are integrated with or adjacent to elementary or other schools;
- Children with chronic illnesses such as asthma may experience increased vulnerability to

⁵ U.S. Environmental Protection Agency, "An Introduction to Indoor Air Quality (IAQ)," U.S. Environmental Protection Agency, Washington, DC. Last modified November 29, 2010. Available at: www.epa.gov/iaq/ia-intro.html.

⁶ "Developmental Toxicity: Special Considerations Based on Age and Developmental State," in *Pediatric Environmental Health, 2nd Edition*, ed. Ruth A. Etzel and Sophie J. Balk, American Academy of Pediatrics Committee on Environmental Health (2003) 9-36.

⁷ U.S. Environmental Protection Agency, "Child-Specific Exposure Factors Handbook (Final Report)," U.S. Environmental Protection Agency, National Center for Environmental Assessment, Office of Research and Development, Washington, DC, EPA/600/R-06/096F, September 2008. Available at: <http://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=199243#Download>.

environmental toxicants.⁸ Asthma continues to be a significant problem among school age children; and

- There is potential for children who are actively engaged in structured and unstructured outdoor physical activity, including sports activities, to be disproportionately affected by outdoor air pollution because intake of air increases during periods of increased physical activity. Also, when mouth breathing occurs, the process of deposition in the upper respiratory tract is bypassed with direct deposition in the lungs of any environmental contaminants present in the air.

Research has confirmed that the quality of a school facility has an impact on students' experiences and ultimately on their educational achievement. Research on school building conditions and student outcomes finds a consistent relationship between poor facilities and poor performance: higher student achievement is associated with school facilities that are clean, in good repair and designed to support high academic standards, independent of student socioeconomic status.⁹ (www.epa.gov/schools/siting/resources)

1.4.2. Principle 2. The environmental review process should be rigorous, thorough and well-documented, and include substantive and ongoing meaningful public involvement

Selecting sites where environmental reviews have recently been conducted and documented (within the past six months) or performing an environmental review on candidate locations is the only means of determining if there are any

⁸ World Health Organization, "The Physical School Environment: An Essential Component of a Health-Promoting School," The World Health Organization's Information Series on School Health Document No. 2 (2004). Available at:

http://www.who.int/school_youth_health/media/en/physical_sch_environment_v2.pdf.

⁹ M.J. Mendell and G.A. Heath, "Do indoor pollutants and thermal conditions in schools influence student performance? A critical review of the literature," *Indoor Air* (2005) 15:1. 27-52. Available at:

<http://onlinelibrary.wiley.com/doi/10.1111/j.1600-0668.2004.00320.x/full>.

onsite or offsite environmental hazards that may pose a health risk to students and staff. If there are potential hazards associated with the preferred location, in addition to identifying the potential hazards, the LEA and the **school siting committee (SSC)** (see Section 3.3) with **meaningful public involvement** (see Section 3) can use the **environmental review process** (see Section 5) to determine what cleanup, mitigation and long-term stewardship should be implemented to ensure the safety and health of all school occupants.

A thorough and transparent environmental review process will help reduce the likelihood that natural hazards (e.g., flooding) or environmental hazards (e.g., site contamination) will be discovered after the school is located and operating, thus reducing potential adverse environmental and public health effects on children, legal and financial liability and/or public backlash. The rationale for choosing one location over another should be clearly articulated based on a robust review of candidate locations, especially if the environmental review is a deciding factor. Moreover, all engineering and scientific reporting must comply with applicable federal, state, tribal and local regulations.

Stakeholder groups such as parents, teachers and other school personnel, and nearby residents are most directly impacted by school siting decisions and should be fully engaged in the review and decision-making process. These guidelines provide important information and links throughout, especially in the **Quick Guide to Environmental Issues** (see Section 8) and on the Resources page of the guidelines website, to address the need for technical assistance and training to enable meaningful participation by parents and nearby residents, including minority and low-income populations.

(www.epa.gov/schools/siting/resources)

State and tribal environmental regulatory agencies may play a central role in oversight and approval of the environmental review where contaminated sites are being considered (see Section 7). Their involvement is critical in any site

remediation and site management plans as well as ensuring the integrity of **long-term stewardship plans** (see Section 5.10), including any **institutional and engineering controls** (see Section 8.15) in place to prevent exposures, so they can be relied upon over the long term.

1.4.3. Principle 3. Schools should be located in environments that contribute to the livability, sustainability and public health of neighborhoods and communities

Investments in educational facilities represent one of the largest capital outlays that many states, tribes and local governments make. Decisions about the construction and renovation of schools will have important implications for communities beyond educational outcomes. Communities may choose to use these investments to meet multiple goals—education, health, environmental, economic, social and fiscal. Both the location and design of a school and its accessibility to residents outside of class hours, including residents with disabilities, play a major role in determining what benefits it provides to the community. Many communities that are re-evaluating their growth patterns and infrastructure investments are also assessing how and where they spend their education dollars. Integrating school planning with broader community plans, visions and goals can produce neighborhood-centered schools that offer high-quality educational programs while benefiting the environment, health and well-being in many ways.

National trends in school siting and size have largely followed the model of building new schools at the edges of communities on large, undeveloped parcels of land away from the neighborhoods and towns they serve. Average school size (in terms of student population per school) has steadily grown. According to the National Center for Education Statistics, the number of schools in the United States decreased

from 262,000 in 1930 to 95,000 in 2004.¹⁰ (<http://nces.ed.gov/>) Student population over the same period rose from 28 million to 54.5 million. This approach of constructing large schools on undeveloped locations often leads to underinvestment in the community core and existing facilities and increases public expenditures, vehicular travel, traffic congestion, pollution and loss of open space. Accordingly, many residents in older neighborhoods have lower access to public infrastructure and recreational locations, such as school playgrounds and athletic fields. Instead, schools should be a hub for the whole community, by providing public spaces for recreation and learning, extended hours before and after school and during the weekends and summer, and space for academic and non-academic services such as social services and activities that engage parents and the entire community. The National Trust for Historic Preservation's 2009 report "Helping Johnny Walk to School" outlines the benefits of retaining community centered schools.¹¹ It can be found here: www.preservationnation.org/issues/historic-schools/.

Encouraging physical activity

The location of a school and the school environment can influence levels of physical activity. Further, the American Academy of Pediatrics Committee on the Environment wrote in 2009, "The most universal opportunity for incidental physical activity among children is getting to and from school."¹² Many studies show that the distance between home and school is the

¹⁰ U.S. Department of Education Institute of Educational Sciences, "National Center for Educational Statistics Fast Facts." (Accessed on September 16, 2011) Available at: <http://nces.ed.gov/fastfacts/display.asp?id=84>.

¹¹ Renee Kuhlman, "Helping Johnny Walk to School: Policy Recommendations for Removing Barriers to Community-Centered Schools," National Trust for Historic Preservation (2010). Available at: www.preservationnation.org/issues/historic-schools/helping-johnny-walk-to-school/helping-johnny-walk-to-school.pdf.

¹² American Academy of Pediatrics Committee on Environmental Health, "The Built Environment: Designing Communities to Promote Physical Activity in Children." *Pediatrics* (June 2009) 123:6. 1593. Online article available at: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;123/6/1591>.

strongest predictor of whether students walk or bike to school.¹³ The U.S. Department of Transportation reports that the number of students ages 5 to 18 who walk or bike to school has declined dramatically over the past few decades, from 41 percent in 1969 to only 13 percent in 2001.¹⁴ This has coincided with a sharp increase in obesity rates among children. According to the Centers for Disease Control and Prevention (CDC), the prevalence of obesity among children ages 6 to 11 nearly tripled in the past three decades, increasing from 6.5 percent in 1976 – 1980 to 19.6 percent in 2007 – 2008. The rate among adolescents ages 12 to 19 more than tripled, increasing from 6.5 percent to 18.1 percent over the same period.¹⁵

Obesity rates and associated chronic disease rates are substantially higher in minority populations. Yet, these communities often lack access to opportunities for physical activity and to affordable and nutritious food.¹⁶ Well-sited schools within these neighborhoods combined with *Safe Routes to Schools*¹⁷ (see Section 4.3.4) efforts and reinvestment in infrastructure that increases pedestrian and bike safety can increase the opportunity for incidental physical activity and may help address this environmental inequity

¹³ Safe Routes to School National Partnership, "The Influence of the Built Environment on Travel Behaviors." (Accessed on September 16, 2011) Available at: www.saferoutespartnership.org/mediacenter/research/231317.

¹⁴ U.S. Department of Health and Human Services at Centers for Disease Control and Prevention, "Kids Walk-to-School: Then and Now—Barriers and Solutions," Last modified February 25, 2008. Available at: www.cdc.gov/nccdphp/dnpa/kidswalk/then_and_now.htm.

¹⁵ Cynthia Ogden and Margaret Carroll, "Prevalence of Obesity Among Children and Adolescents: United States, Trends 1963-1965 Through 2007-2008," National Center for Health Statistics Health E-Stat Centers for Disease Control and Prevention. Last modified June 4, 2010. Available at: www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.htm.

¹⁶ Centers for Disease Control and Prevention, "CDC Health Disparities and Inequalities Report—United States, 2011," *Morbidity and Mortality Weekly Report* (January 14, 2011) 60 (Suppl). Available at: www.cdc.gov/mmwr/pdf/other/su6001.pdf.

¹⁷ Safe Routes to School National Partnership, "Impact of Physical Activity on Obesity and Health." (Accessed on September 16, 2011) Available at: www.saferoutespartnership.org/mediacenter/research/230339.

and health disparity. Numerous studies have shown that when schools are within an easy walking or biking distance of residential areas and the routes to school are safe, students increase their participation in physical activity.¹⁸ (www.epa.gov/schools/siting/resources) In a study of adolescents, 100 percent of students who walked both to and from school met the recommended levels of 60 or more minutes of moderate to vigorous physical activity on weekdays.¹⁹ Community centered schools that encourage daily physical activity lead to better health for children, for example better cardiovascular fitness, and healthier communities and may reduce risk of obesity and chronic disease.²⁰

School siting that supports walking or biking to school can also contribute to academic achievement. The 2010 CDC report, "The Association between School-based Physical Activity, including Physical Education, and Academic Performance" (www.cdc.gov/healthyyouth/health_and_academics/pdf/pape_executive_summary.pdf), synthesized the scientific literature examining indicators of cognitive skills and attitudes, academic behaviors and academic achievement. The report found substantial evidence that physical activity can help improve academic achievement, including grades and standardized test scores. The review suggests that physical activity can have an impact on cognitive skills and attitudes and academic behavior, all of which are important components of improved academic performance. These include enhanced

¹⁸ Active Living Research, "Walking and Biking to School, Physical Activity and Health Outcomes," Research Brief (May 2009). Available at: www.activelivingresearch.org/files/ALR_Brief_ActiveTransport.pdf.

¹⁹ Leslie M. Alexander, Jo Inchley, Joanna Todd, Dorothy Currie, Ashley R. Cooper and Candace Currie, "The broader impact of walking to school among adolescents: seven day accelerometry based study," *British Medical Journal* (2005) 331:7524. 1061–1062. Available at: www.ncbi.nlm.nih.gov/pmc/articles/PMC1283187/

²⁰ American Academy of Pediatrics Committee on Environmental Health, "The Built Environment: Designing Communities to Promote Physical Activity in Children," *Pediatrics* (June 2009) 123:6. 1591-1598. Online article available at: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;123/6/1591>.

concentration and attention as well as improved classroom behavior.²¹

Reducing environmental impacts on air, water and land

The location of a school affects the environment in complex ways. Locating schools in the neighborhoods they serve, reusing infrastructure and renovating buildings conserve energy and resources. Integrating schools into neighborhoods instead of building them on undeveloped land on the fringe of the community preserves the natural environment, including farmland, fields and wildlife habitat. By using existing buildings, roads, parking lots and other infrastructure, communities can avoid building more impervious paved surfaces, which in turn reduces contaminated water runoff into nearby lakes, rivers and streams. Appropriate consideration of a school's potential environmental impact can help to preserve and nourish the natural and human resources of a community.

As noted earlier, the percentage of children that walk or bike to school dropped from 41 percent in 1969 to about 13 percent in 2001. Bus ridership has remained relatively stable during the same period, with about 55 percent of students riding a school bus in 2004.²² This means that the proportion of children arriving at school in privately owned vehicles has increased—a change that has implications for overall traffic and emissions. Increases in traffic can raise emissions of numerous pollutants, including criteria air pollutants, air toxics and greenhouse gases. In addition, traffic congestion around schools decreases child safety. Data from the 2001 National Household Transportation Survey show that the distance a child lives from school

²¹ Centers for Disease Control and Prevention, "The Association Between School-Based Physical Activity, Including Physical Education, and Academic Performance," U.S. Department of Health and Human Services (April 2010). Available at: www.cdc.gov/healthyyouth/health_and_academics/pdf/pape_executive_summary.pdf.

²² Safe Routes to School National Partnership, "National Statistics on School Transportation, Safe Routes to School: Creative and Safe Solutions to School Bus Cuts." (Accessed on September 16, 2011) Available at: www.saferoutespartnership.org/media/file/school_bus_cuts_national_stats_FINAL.pdf.

influences the choice of whether to walk, bike, ride a bus or get a ride in a car. For trips of less than $\frac{1}{4}$ of a mile, walking or biking is the dominant mode. For trips of $\frac{1}{4}$ to $\frac{1}{2}$ a mile, private automobiles account for about half the trips to and from school. At a distance of 1 mile and beyond, the majority of the trips are by private automobile.²³

Additionally, schools that apply integrated site and building design practices incorporating green principles and standards (See: www.epa.gov/schools/siting/resources)—such as those from the Collaborative for High Performance Schools (CHPS) (www.chps.net/dev/Drupal/node) and the EPA's ENERGY STAR program (www.energystar.gov/k-12)—improve educational opportunities through use of the building and practices as teaching tools; improve energy, material and resource efficiency; improve indoor environmental quality; and help create models of sustainable neighborhoods.

1.4.4. Principle 4. The school siting process should consider the environmental health and safety of the entire community, including disadvantaged and underserved populations

A growing body of research suggests that minority and low-income children are more likely to attend schools that are in poor condition or have received inadequate maintenance due to lack of resources.²⁴ Studies also highlight the disproportionate percentage of minority and low-income children that are exposed to multiple environmental hazards in close proximity to the schools they attend.²⁵ These environmental

²³ U.S. Department of Transportation Federal Highway Administration, "National Household Travel Survey," NHTS Brief (January 2008). Available at: www.saferoutespartnership.org/media/file/Travel_To_School.pdf.

²⁴ Daria E. Neal, "Healthy Schools: A Major Front in the Fight for Environmental Justice." *Lewis & Clark Law School's Environmental Law Online* (n.d.) 38:2 (Accessed on September 16, 2011) Available at: www.elawreview.org/elaw/382/healthy_schools_a_major_front.html.

²⁵ David Salvesen, Peter Zambito, and Dylan McDonnell, "Safe Schools: Identifying Potential Threats to the Health and Safety of Schoolchildren in North Carolina," Center for Sustainable Community Design Institute for the Environment, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina (November 2010). Available at: www.ie.unc.edu/cscd/pdf/Safe_Schools_Final_Report.pdf.

hazards range from exposures to outdoor air toxics to various exposures that originate within the school boundaries. Minority and low-income children may be even more at risk from these environmental hazards given the presence of other factors, such as poor nutrition, lack of access to health care and pre-existing health conditions. The adverse health effects from these exposures may result in both short-term effects, such as poor school performance due to increased absenteeism, and possible long-term effects, such as the development of a serious learning disability, respiratory illness or other disease.

Policies that encourage the renovation of existing schools, with appropriate mitigation of environmental hazards if necessary and the siting of new facilities within existing neighborhoods can contribute to solving multiple challenges in older communities. Conversely, policies that discourage renovating existing schools or siting schools within the community can lead to a disinvestment in the community that may contribute to physical, social and economic decline in the community. Siting schools in the communities they serve—particularly in urban areas where disinvestment in neighborhoods has led to chronic environmental, economic and public health disparities—can be part of a revitalization strategy aimed at a wide range of improved community outcomes. School grounds can provide important play and recreational space for children.²⁶ Research shows that in inner-city neighborhoods, children are more likely to be physically active when there is a safe, easily accessible play space such as a schoolyard than when their neighborhood does not have a similar

²⁶ Ad-Hoc Coalition for Healthy School Siting, "Revising CDE School Siting Policy Documents: How California's School Siting Policies Can Support a World-Class Educational System," Submitted to the California Department of Education by the Ad-Hoc Coalition for Healthy School Siting (January 31, 2008). Available at: http://citiesandschools.berkeley.edu/reports/School_Siting_Policy_Brief_013108.pdf.

space.²⁷ Because these facilities are located within walking distance, families and children are more likely to use them.²⁸ School locations that are accessible by walking or biking make it easier for families without cars to be part of their children's school community and helps to reduce transportation expenses. Rates of auto ownership are lower among low-income and minority populations and being closer to the school makes it easier for parents to be involved in the school community.²⁹ The benefits of locating schools in the communities they serve should be considered, especially in cases where the school will be serving disadvantaged or underserved populations.

When renovation or new construction of school facilities in existing communities is paired with a joint-use program—using the location for K-12 education as well as an adult vocational training center in the evenings, for instance—communities benefit. Joint use schools can also include public libraries, amenities such as swimming pools and gyms, public health centers, and counseling clinics. Co-locating these uses leverages public and private dollars more efficiently, reuses existing infrastructure and contributes to the vibrancy of existing communities. Joint use agreements can be used to address LEA or community concerns about costs, vandalism, security, maintenance and liability in the event of injury. For more on joint use and joint use agreements see the Center for Cities and Schools (<http://citiesandschools.berkeley.edu/>) and the National Policy and Legal Analysis Network to Prevent Childhood Obesity (www.nplanonline.org/nplan/joint-use) websites.

²⁷ Thomas A. Farley et al., "Safe Play Spaces To Promote Physical Activity in Inner-City Children: Results from a Pilot Study of an Environmental Intervention," *American Journal of Public Health* (September 2007) 97:9. 1625-1631. Available at: www.ncbi.nlm.nih.gov/pmc/articles/PMC1946732/pdf/njaf3.org/edu/docs/Reports_Safe-Places-to-Play-Report.pdf.

²⁸ National Policy and Legal Analysis Network to Prevent Childhood Obesity, "Healthy School Siting." (Accessed on September 16, 2011) Available at: www.nplanonline.org/nplan/healthy-school-siting.

²⁹ Adam Carasso and Signe-Mary McKernan, The Urban Institute, "The Balance Sheets of Low-Income Households: What We Know about Their Assets and Liabilities," Prepared for U.S. Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation (November 2007). Available at: <http://aspe.hhs.gov/hsp/07/PoorFinances/balance/index.shtml>.

The renovation of an existing school or the siting of a new school facility on a previously developed site can reduce or eliminate expenses that might have otherwise been incurred—for new infrastructure like roads and sewers, separate locations for the different uses, and the costs of transporting children out of their neighborhood to the new facility.³⁰ It can also mean that a facility or site that was once seen as a blight or blemish on a community or neighborhood has been transformed into a community asset.³¹ When prospective locations for schools are taken out of the discussion solely because they were previously used or are in disrepair, or when recent trends towards larger, dispersed, and auto- or bus-access only schools are followed, communities in most need of reinvestment can miss out on significant opportunities for catalytic investments.^{32,33} Links to more information on disparities and environmental justice are provided in the Resources page of the guidelines website. (www.epa.gov/schools/siting/resources)

³⁰ National Trust for Historic Preservation, "Older and Historic Schools: Restoration vs. Replacement and the Role of a Feasibility Study," Last updated January 2010. Available at: www.preservationnation.org/issues/historic-schools/additional-resources//school_feasibility_study.pdf.

³¹ Ariel H. Bierbaum, Jeffrey M. Vincent and Erika Tate, "Building Schools and Community," *Race, Poverty and the Environment* (Spring 2008) 15:1. Available at: <http://urbanhabitot.org/files/15.Bierbaum.et.al.pdf>.

³² Renee Kuhlman, "Helping Johnny Walk to School: Policy Recommendations for Removing Barriers to Community-Centered Schools," National Trust for Historic Preservation (2010). Available at: www.preservationnation.org/issues/historic-schools/helping-johnny-walk-to-school/helping-johnny-walk-to-school.pdf.

³³ Constance E. Beaumont and Elizabeth G. Pianca, "Why Johnny Can't Walk to School: Historic Neighborhood Schools in the Age of Sprawl," 2nd ed. National Trust for Historic Preservation (October 2002). Available at: www.preservationnation.org/issues/historic-schools/additional-resources/schools_why_johnny_1.pdf.

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