



Indoor Air Quality: Governing Board Actions for Creating Healthy School Environments

It is important that governing boards recognize the link between wellness and student learning and the district's responsibility to provide healthy school environments for students and staff. Poor indoor air quality (IAQ)—including inadequate ventilation, contaminants of the air and temperatures that are too high or too low—is one factor that, if not adequately addressed, may contribute to absenteeism and reduced performance of both students and staff.

This policy brief focuses on strategies that can be taken by governing boards, working together with superintendents and district administrators, for the prevention and early intervention of IAQ problems in school facilities. It is based on the assumption that efforts to address IAQ should be part of a coordinated, proactive approach to environmental, safety and health issues in the district's schools.

How does indoor air quality affect schools?

The U.S. Environmental Protection Agency suggests some reasons that school districts need to be concerned about IAQ:¹

1. Indoor air pollutants can cause or contribute to short- and long-term health problems, including asthma, respiratory tract infection and disease, allergic reactions, headaches, nasal congestion, eye and skin irritations, coughing, sneezing, fatigue, dizziness and nausea.
2. Indoor air pollutants and extremes in temperature and humidity may cause discomfort, which can affect students' ability to concentrate and learn.
3. IAQ problems can hasten building deterioration, contribute to the closing of schools and create liability problems.

Poor IAQ can harm both children and adults, but children are especially vulnerable. Their physiology makes them more susceptible to chemicals that affect development and lung function, their immune systems are not fully developed, and they inhale more air relative to their size than do adults and therefore inhale a larger relative dose of pollutants.²

Although few studies have been conducted in school environments to explore the direct relationship between IAQ and student achievement, some research provides preliminary evidence of the link between poor environments and student attendance and performance.³

Indoor air quality and asthma

Air quality issues, such as allergens and airborne irritants, are among the stimuli that can trigger asthmatic symptoms.

Asthma is a chronic disease of the airways in the lungs. The bronchial airways become inflamed, reducing the amount of air that can be inhaled and contributing to recurrent acute episodes of breathing problems such as shortness of breath, coughing, wheezing and chest tightness.

Asthma is the most common chronic disorder in childhood, the third leading cause of hospitalization among children under the age of 15, and the number one cause of school absenteeism among children with chronic diseases.

—California School Boards Association, *Asthma Management in the Schools, Policy Brief, March 2008*

What causes poor indoor air quality in schools?

The presence of some IAQ hazards can be determined by foul odors or visual inspection. Others may be detected through routine testing or be noticed only when there are complaints of health problems in the school setting.

IAQ problems in the school environment may include:

- improperly maintained heating, ventilation and air conditioning systems that build moisture or allow outdoor air pollutants and pollens to enter the school

- mold growth resulting from standing water or moisture due to leaks, flooding, condensation or excess humidity
- chemical pollutants from building materials, pesticides, cleaning solvents or materials used in science and art classes
- dust mites found in carpeting, stuffed toys and other cloth/fabric items
- perfumes, chalk dust and other common irritants
- animal dander from classroom pets
- clutter and debris that partially or wholly cover vents and also make proper cleaning difficult
- emissions from printing and duplicating equipment
- asbestos or lead particles entering the air when older building materials are disturbed or deteriorated
- ozone, radon or odors from outside sources
- diesel exhaust from school buses and other vehicles idling near windows and doors

Some IAQ problems have been linked to building construction practices or delayed maintenance due to budget constraints. Portable classrooms and other temporary structures may be especially prone to IAQ problems. Remediation of some IAQ problems may require prioritization of costly projects, but other indoor air contaminants may be easily remedied through changes in district practice.

Extent of the problem

About one-fifth of schools in the United States report unsatisfactory indoor air quality, and one-fourth report inadequate ventilation.

—National Center for Education Statistics, *Condition of America's Public School Facilities, 1999*

What can school boards do to improve indoor air quality?

Providing good IAQ requires attention to the cleanliness of facilities, timely repairs of facilities, and the purchase, appropriate use and maintenance of equipment. These

duties are largely a responsibility of administrators, engineers and construction workers, maintenance staff and other staff. However, the school board is ultimately accountable for the condition of the district's facilities and needs to ensure that a consistent, effective program is in place throughout the district.

A comprehensive IAQ management program begins with the commitment of the board and staff to focus on issues of healthy school environments. It should include an ongoing assessment of IAQ conditions in the schools, a strategic plan for preventing and resolving IAQ problems, board support for staff implementation of identified actions, an evaluation of the IAQ management program, and communications to staff, parents and the community regarding the intent, results and next steps in the IAQ management program.

IAQ management programs

A nationwide survey found that about one-third of school districts (35.4 percent) and half of schools (51.4 percent) have a comprehensive IAQ management program.

—Centers for Disease Control and Prevention, *School Health Policies and Programs Study (SHPPS), 2006*

The school board can help ensure that school environments provide good air quality through each of its major job responsibilities:

Setting direction

The school board has an opportunity to set expectations for healthy school environments as it adopts a vision and goals for the district. The vision and goals can reflect the board's understanding of the link between the well-being of students and staff and their performance and productivity. By stating the board's desire to provide safe, clean, well-maintained and environmentally secure school facilities, the board focuses attention on the importance of IAQ and related issues. The board also might express its intent that the district reduce indoor air pollutants through proactive, preventative measures to the extent possible.

The board may go further by directing the superintendent to establish a written strategic plan describing actions that will be taken to improve air quality in schools. This plan should be aligned with board policies and the district's master facilities plan, identify priority needs, describe preventative maintenance and operations as well as emergency responses, and estimate costs and potential savings associated with various actions.

Development of a strategic plan should be based on a needs assessment of each school building which includes, at a minimum, an evaluation of:⁴

- the heating, ventilation and cooling systems
- the chemicals and materials in use or in storage in and around the school
- the condition of the roof, ceilings, walls, windows, doors, floors and carpets, with special attention to moisture and particulate matter
- the condition of horizontal surfaces, with regard to dirt and dust
- the condition of porous materials, such as drapes, furniture and partitions
- the presence of insects and feathered or furry animals
- the schedule, frequency and effectiveness of maintenance

Assessment of school environments

Education Code 17070.75 and 17002 require any district participating in the state's School Facility Program or Deferred Maintenance Program to have a facility inspection system in place that is aligned with the Facility Inspection Tool developed by the Office of Public School Construction. See CSBA's sample board policy BP 3517 - Facilities Inspection.

Another tool that may be useful to districts in evaluating their school facilities for key environmental, safety and health issues is the EPA's *Healthy School Environments Assessment Tool* (HealthySEAT). This software tool is designed to be customized and used by district staff to conduct voluntary self-assessments of schools and to track and manage information on environmental conditions. The primary environmental topics assessed in HealthySEAT include indoor air quality, outdoor air pollution, moisture/mold control, chemical management, energy efficiency, hazardous materials and waste, nonhazardous waste, pest control, ultraviolet radiation, water, portable/relocatable classrooms and construction/renovation.

Although the board does not necessarily need to approve the strategic plan, it should be informed of the results of the needs assessments and should approve components of the plan that affect the district budget and priorities.

Establishing an effective and efficient structure for the district

The board is responsible for establishing and maintaining an organizational structure that supports the district's vision, such as adopting the district budget, adopting policies and making decisions regarding facilities. As it carries out its role in these areas, the board can help ensure that the district has the resources and other structures necessary to implement a high-quality IAQ management program.

Setting budget priorities and adopting the district budget

If the district has established a strategic plan addressing IAQ, that plan should contain estimated costs of actions needed at each school. Each year the board should allocate resources as appropriate depending on the urgency of IAQ projects and available funding.

Some problems can be fixed for little or no cost, such as making sure that air vents are not blocked and replacing filters. Other fixes, such as replacing a ventilation system or removing old carpets, may be more costly. To minimize costs, districts should look for ways to incorporate air quality projects into existing budgets. IAQ actions may be tied to school renovations or other improvement projects. The board also should consider the potential savings, such as increased energy efficiency, that may result from the initial expenditures.

In making budget decisions, boards have to balance many competing demands. Although it may be necessary to re-examine some IAQ projects in times of extreme fiscal constraint, boards should realize that deferring preventative projects now may result in more costly remedies in the future.

An ounce of prevention is worth a pound of cure

"The expense and effort to prevent most IAQ problems are typically less than the expense and effort to resolve problems after they develop."

—U.S. Environmental Protection Agency, *IAQ Coordinator's Guide: A Guide to Implementing an IAQ Program*, January 2005

Adopting board policies in support of IAQ management

Through the development and adoption of policy, the board can provide direction to the superintendent and district staff regarding what the board wants the district to achieve in the area of IAQ and related issues.

CSBA addresses IAQ in its sample board policy and administrative regulation BP/AR 3514 - Environmental Safety, which also includes actions to minimize exposure to lead, asbestos, poor outdoor air quality and diesel exhaust caused by vehicle idling. Both the sample board policy and administrative regulation were updated in July 2008 to expand the material related to IAQ based on recommendations in the EPA's *Indoor Air Quality Tools for Schools* kit and other resources. Districts are encouraged to review the sample materials and modify them to reflect district needs and practices.

As revised, AR 3514 addresses:

- the inspection, operation and maintenance of heating, ventilation and air conditioning systems
- prevention and remediation of mold and mildew
- repair of cracks and openings to minimize seepage of radon
- pest control measures
- routine housekeeping and maintenance schedules and practices, including the use of cleaning products
- painting of school buildings
- use and storage of paints, adhesives and solvents
- placement of printing and duplicating equipment
- enforcement of the district's tobacco-free schools policy
- reduction of common irritants in the classroom such as perfumes, stuffed toys and animals

It also addresses the need for related professional development. Maintenance staff need to be familiar with the district's policies and procedures related to IAQ and need ongoing staff development to effectively perform their custodial responsibilities. Administrators, teachers and other staff also must understand that their behaviors can affect the quality of air present in school buildings. For instance, adjusting room thermostats or turning off noisy unit ventilators can worsen the quality of air. Teachers should keep their classrooms free of clutter to ensure that air vents remain unblocked and to help custodians clean effectively. Chalkboards should be erased daily using a damp cloth or eraser to control chalk dust.

When developing or revising policy related to IAQ, the board may want to review related district policies to ensure a comprehensive, consistent approach to creating healthy school environments. For example, in addition to BP/AR 3514, CSBA provides the following sample board policies and/or administrative regulations: BP 3517 - Facilities Inspection, AR/E 1312.4 - Williams Uniform Complaint Procedures (includes procedures for complaints regarding facilities conditions), BP/AR 5141.23 - Asthma Management, BP/AR 6163.2 - Animals at School, AR 3514.2 - Integrated Pest Management, BP/AR 3514.1 - Hazardous Substances, BP 6161.3 - Toxic Art Supplies, BP/AR 3513.3 - Tobacco-Free Schools, and BP/AR 3550 - Food Service/Child Nutrition Program (addresses food safety issues).

Complaint procedures

Education Code 35186 requires districts to establish a complaint procedure for conditions of school facilities that pose an emergency or urgent threat to the health or safety of students or staff, including, but not limited to, gas leaks; nonfunctioning heating, ventilation, fire sprinkler or air conditioning systems; major pest or vermin infestation; and abatement of hazardous materials. The superintendent should ensure the district's compliance with these provisions through the adoption and implementation of administrative regulations (see CSBA's sample AR/E 1312.4 - Williams Uniform Complaint Procedures).

Making decisions about the construction or renovation of school facilities

In addition to providing broad direction on school facilities management issues through the adoption of district policies, the board makes specific decisions about the construction, reconstruction, renovation, upgrading, site selection, design and furnishing of facilities in accordance with law. The board also approves architectural, engineering and construction contracts.

Thus, the board has opportunities to address IAQ by requiring that air quality be considered in facilities planning and design. Decisions about interior spaces and equipment can impact IAQ, as can environmental conditions in the surrounding area that may need to be addressed or at least minimized.

Before making facilities-related decisions, the board can ensure that local environmental health authorities have been consulted as appropriate and can ask questions about whether environmental factors were considered in the proposals. Potential issues include:⁵

- the effect on air quality of the building's shape and size, orientation, layout, types of windows and doors and building materials
- location of housekeeping storages, toilets, workshops, food service areas, art and science rooms and other emission-producing spaces
- manufacturer's emissions data related to building materials
- whether the ventilation system meets standards recommended by the American Society of Heating, Refrigeration and Air Conditioning Engineers as incorporated into the California Energy-Efficiency Building Standards
- sources of natural ventilation
- life cycles and maintenance requirements of materials and equipment
- any nearby sources of air pollution
- the presence of radon or other potentially harmful substances
- prevailing winds

In addition, the board should ensure that procedures are in place to protect building occupants from fumes and dust during construction, renovation or relocation and that such activities are restricted to non-school hours whenever possible.

Facilities design

"The goal of safe and healthful air is achievable through attention to building design and operation. Concern for detail can result in buildings that promote learning and protect the health of our most valuable resource, California's schoolchildren."

—California Department of Education, *Indoor Air Quality: A Guide for Educators*, 1995

Providing support

After establishing effective and efficient structures that provide guidance in the area of IAQ, the board has a responsibility to support the superintendent and staff as they carry out the direction of the board. This includes upholding policies that have been adopted by the board, aligning resources and other decisions with mutually agreed upon priorities and being knowledgeable about district efforts in order to explain them to the public.

It also means taking actions to create a positive school and district climate, including high student and staff morale. Toward this end, it is especially important that the board and administration not discourage reports of suspected IAQ problems and that staff and students be taken seriously when they report odors or physical ailments that may be caused by poor IAQ. Staff should be encouraged to inform the appropriate person if they or students experience physical discomfort such as persistent headaches, itchy eyes or respiratory distress. Any such report should be investigated promptly and the complainant should be notified of any findings and planned actions.

Building a positive personnel climate also means publicly recognizing staff accomplishments. The board should remember to recognize the facilities and maintenance staff for collaborative efforts in addressing healthy school environments throughout the district.

Ensuring accountability to the public

The board is accountable to the public for the condition and performance of the community's schools. It must work with the superintendent to establish measures and reporting mechanisms that will be used to assess the effectiveness of the district in maintaining good air quality in the schools. Examples of such measures include:

- a report on the district's progress in implementing the actions identified in the district's strategic plan for IAQ
- baseline measures and periodic follow-up measures of specific environmental conditions in each school building, using a tool such as the EPA's *Healthy School Environments Assessment Tool*
- the district's facility inspection report completed pursuant to Education Code 17070.75 and 17002
- the number and resolution of complaints concerning the condition of district facilities
- any change in student or staff absenteeism, visits to the school nurse or asthma episodes following the implementation of IAQ strategies

In addition to determining the indicators that will be used to measure success, the board should determine how often it wishes to receive reports from the superintendent. The results should be communicated to the public and used to either celebrate progress or make corrections in the district's program as needed.

A Multifaceted Approach

“Look at the big picture. Creating healthy school environments is about more than IAQ; it’s also about risk management, safety, health, curriculum and achievement.”

—*American Association of School Administrators, Building Success: Leading Change: Stories of Healthy School Environments, October 2007*

Acting as community leaders

The board has a responsibility to establish effective two-way communications with the community: The board (as well as the superintendent and staff) must inform and educate the community about the district’s programs and also must provide opportunities for public input and meaningful involvement in the schools.

Informing the community

Communications to the public should, as part of the board’s accountability function described above, include information regarding the goals, implementation and effectiveness of the district’s IAQ program. Staff, parents and the community should be informed of actions that the district is planning to implement in order to create healthy school environments.

Because IAQ problems and other environmental hazards may cause or exacerbate health concerns, the district should inform students, parents, staff, the public and governmental agencies, as appropriate, when a potentially serious problem has been identified in a school building. Reporting any such information must be done carefully to avoid overreaction. Notifications should include clear explanations of the extent of the problem, the potential risks and actions the district is taking to remedy the problem.

Involving the community

Obtaining input and feedback from the community regarding the district’s IAQ program includes providing opportunities for public input during board meetings and ensuring that appropriate procedures are in place for receiving and responding to any complaints regarding the condition of school facilities.

It also includes encouraging the involvement of the regional EPA, city and county agencies, local health professionals, nonprofit organizations, businesses and other local resources in the development of the district’s policies, administrative regulations and/or IAQ strategic

plan. The board or superintendent may establish an advisory committee to help address this issue or may participate in a communitywide collaborative effort to address air quality and health issues.

Community collaboration: Asthma Coalition of Alameda County

The Oakland Unified School District has teamed up with the Asthma Coalition of Alameda County to provide asthma and IAQ services for the past six years. Community partners in the coalition include, but are not limited to, Oakland Berkeley Community Action to Fight Asthma, Alameda County Health Department, the districtwide Coordinated School Health Council, Children’s Hospital, the West Oakland Asthma Coalition and local providers and health insurers.

This partnership has benefited the district through coordination with the district asthma nurse and other staff in the areas of asthma surveillance; training of volunteers to implement evidence-based curricula to educate students on asthma management; assisting with EPA’s *Tools for Schools*; use of state Emergency Repair Program funds, created by the Williams settlement, to remediate facilities in need of repair; summer Asthma Camp at no cost to students; and education of staff and parents. Additional funding sources have been obtained through coalition work, such as grants from the Centers for Disease Control and Prevention, Kaiser and The California Endowment.

Lessons learned by the participants include the need for time commitment and staffing from the school district and strong lead organizations within the coalition. The coalition must have a clear mission and faithful support from all participating organizations.

In order to effectively fulfill their role as community leaders on these issues, board members do not need to be experts on environmental health and safety issues, but they must be knowledgeable about the health implications of poor IAQ and the major provisions of the district’s plan to maintain good air quality. They must be able to assure the community that the district recognizes the importance of good IAQ and is taking appropriate steps to ensure that schools provide a healthy environment for students, staff and the community.

Resources

The following resources provide additional information about IAQ, asthma management and related issues:

CSBA: CSBA's Governance and Policy Services Department issues sample board policies and administrative regulations, policy briefs, advisories and fact sheets on a variety of topics related to facilities, environmental safety and student health, including asthma management.

www.csba.org

American Association of School Administrators: See AASA's Web site for *Building Success, Leading Change: Stories of Healthy School Environments* (October 2007), *Putting the Pieces Together: An Urban School Leader's Guide to Healthy Indoor Environments* (February 2007) and other valuable resources. AASA has organized an Urban Healthy Schools Coalition and a Rural Healthy Schools Coalition to support initiatives focused on improving IAQ and creating healthier schools.

www.aasa.org

American Lung Association of California: ALAC provides information about air quality, asthma policy, asthma education in schools, asthma camp and fact sheets that may be downloaded.

www.californialung.org

California Air Resources Board: The Air Resources Board has conducted a number of studies pertaining to children's exposure to air pollutants. In July 2005, the Air Resources Board presented a report to the Legislature on *Indoor Air Pollution in California*, including information on the health effects and sources of indoor pollutants, the effects of existing regulations and industry practices, and possible mitigation for schools, homes and nonindustrial workplaces.

www.arb.ca.gov/research/indoor/indoor.htm

California Department of Education: The California Department of Education's Web site contains its 1995 publication *Indoor Air Quality: A Guide for Educators* and links to other valuable resources.

www.cde.ca.gov/lr/fa/hs

California Department of Public Health: The California Department of Public Health provides health information about asthma, environmental health and related issues. *Guidelines for the Management of Asthma in California Schools* (2004) is available at www.caasthma.org/files/dhsASTHMAguidelinesFINAL.pdf.

www.cdph.ca.gov

www.cdph.ca.gov/HealthInfo/environhealth

California Indoor Air Quality Program: The mission of the California Indoor Air Quality Program, mandated by Health and Safety Code 105400-105430, is to conduct and promote the coordination of research, investigations, experiments, demonstrations, surveys and studies related to the causes, effects, extent, prevention and control of indoor pollution in California.

www.cal-iaq.org

Centers for Disease Control and Prevention: The CDC's National Center for Environmental Health promotes a healthy environment and works to prevent illnesses and disabilities caused by environmental and related factors. The CDC monitors the prevalence of asthma and other environmentally related respiratory illnesses and provides resources on mold, radon, carbon monoxide poisoning, lead poisoning, and asbestos. The CDC's Division of Adolescent and School Health (www.cdc.gov/HealthyYouth/Asthma) also has useful resources.

www.cdc.gov

Community Action to Fight Asthma / Regional Asthma Management and Prevention Initiative:

CAFA is a statewide network of asthma coalitions working to shape local, regional and state policies to reduce the environmental triggers of asthma for school-aged children where they live, learn and play. CAFA is coordinated by the RAMP Initiative, a project of the Public Health Institute.

www.calasthma.org

www.rampasthma.org

Environmental Law Institute: The Institute conducts an indoor environments program of research/analysis, outreach and assistance to advance IAQ law and policy. Publications include *School District Liability for Indoor Air Quality Conditions: A Review of Selected Legal Issues* (2005) and *Building Healthy, High Performance Schools: A Review of Selected State and Local Initiatives* (2003).

www.eli.org/Program_Areas/indoor_environments.cfm

National Institute of Environmental Health

Sciences: The mission of NIEHS is to increase understanding of how the environment influences the development and progression of human disease. NIEHS provides information for educators as well as general information on environmental factors/triggers.

www.niehs.nih.gov/health/topics/conditions/asthma/index.cfm

U.S. Environmental Protection Agency:

EPA developed the *Indoor Air Quality (IAQ) Tools for Schools program* (rev. 2007) to reduce exposures to indoor environmental contaminants in schools through the voluntary adoption of sound IAQ management practices. The *IAQ Tools for Schools* program is a comprehensive resource to help schools maintain a healthy environment in school buildings by identifying, correcting and preventing IAQ problems. The checklists available in the *IAQ Tools for Schools* kit help schools address ventilation systems, maintenance procedures, renovations and repairs, classroom practices, administrative offices, health offices, food service areas, pest management, waste management, the role of school officials, and a walkthrough of school buildings.

www.epa.gov/iaq/schools

EPA Region 9 office: www.epa.gov/region09

End Notes

¹ U.S. Environmental Protection Agency, *Indoor Air Quality Tools for Schools: Actions to Improve Indoor Air Quality*, September 1999.

² California Air Resources Board, *Report to the Legislature: Indoor Air Pollution in California*, July 2005.

³ R.J. Shaughnessy, *Correlating Indoor Air to Student Academic Achievement*, University of Tulsa. Also U.S. Department of Education, *A Summary of Scientific Findings on Adverse Effects of Indoor Environments on Students' Health, Academic Performance and Attendance*, 2004.

⁴ J.N. Parker, *Reducing Asthma Triggers in Schools: Recommendations for Effective Policies, Regulations, and Legislation*, Asthma Regional Council of New England, March 2005.

⁵ California Department of Education, *Indoor Air Quality: A Guide for Educators*, 1995.

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