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Adequate & Equitable U.S. PK-12 Infrastructure

PRIORITY ACTIONS FOR SYSTEMIC REFORM

*A report from the Planning for PK-12
School Infrastructure National Initiative*



LEADERSHIP TEAM



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21st Century School Fund is dedicated to building the public will and capacity to modernize public schools so they support high quality education and community revitalization. 21CSF's advances this mission with research, advocacy, innovation and facilitation of civic and public sector networks of organizations and officials dedicated to a country where every child learns in an educationally appropriate, healthy and safe school that serves as a community anchor and is built and maintained in an environmentally and fiscally responsible manner.



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The Center for Cities + Schools in the Institute of Urban and Regional Development at the University of California, Berkeley works to create opportunity-rich places where young people can be successful in and out of school. CC+S conducts policy research, engages youth in urban planning, and cultivates collaboration between city and school leaders to strengthen all communities by harnessing the potential of urban planning to close the opportunity gap and improve education.



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The National Council on School Facilities supports states in their varied roles and responsibilities for the delivery of safe, healthy, and educationally appropriate public school facilities that are sustainable and fiscally sound. This organization is founded on guiding principles which reflect the changing nature of the demands on today's schools and the need for educational facility infrastructure to support these demands.



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The Center for Green Schools at the U.S. Green Building Council believes that everyone, from the kindergartener entering the classroom to the Ph.D. student researching in a lab, should have the opportunity to attend schools that sustain the world they live in, enhance their health and well-being, and prepare them for 21st century careers. The Center works with school decision makers, community volunteers, and thought leaders in the public and private sectors to drive progress at the intersection of sustainability, education, public health, and the built environment.

ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

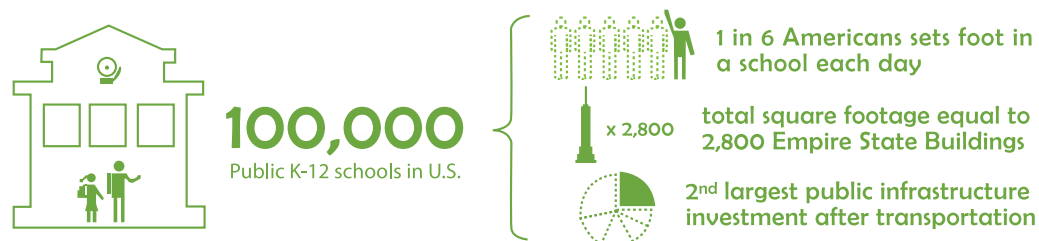
America's PK-12 School Infrastructure Crisis

Our country's elementary and secondary (PK-12) public school infrastructure is in crisis. Every day, millions of children in the U.S. attend public school in unhealthy, unsafe, educationally inadequate, environmentally unsustainable, and financially inefficient facilities. Deteriorated and neglected public school facilities can be found throughout the nation, but the most egregious school facility conditions are in low-wealth school districts and in neighborhoods serving children from low-income families.

The Power of Public Place: PK-12 School Facilities Infrastructure

Nearly 50 million children and another 6 million teachers and other adults — 1/6th of the U.S. population — are in public school buildings every school day. Our public school facilities have broad impacts on children and communities: student, staff, and community health; school quality and academic achievement; economic development; and environment and natural resources. Just as roads and bridges are necessary for mobility, school buildings and grounds are necessary for education. Both transportation and education infrastructures are vital to our democracy and cornerstones of economic strength. We need effective and efficient systems to ensure responsible stewardship of our PK-12 public school infrastructure.

Because of the scale of our public education infrastructure and their broad impacts, America experiences enormous consequences for the deficiencies and disparities in school facility conditions.



The crisis of public school facilities inadequacy and inequity is caused by structural limitations in our underlying political and administrative systems for facilities stewardship. The facilities policies, practices, and funding of local, state, and federal authorities are outdated and underdeveloped. To ensure all school districts can provide adequate and equitable public school facilities, they need modern PK-12 facilities systems. The six basic elements of modern and effective public PK-12 facilities systems are: governance and decision making, funding, management, planning, data and information, and accountability.



Governance & Decision Making



Funding



Management



Planning



Data & Information



Accountability

The priority actions identified through our national planning process are designed to develop and support the essentials for modern PK-12 public infrastructure stewardship.

P4si Initiative: A National Partnership for Systemic Reform

With much at stake, national leaders came together to formulate a *systems-based* plan to address the PK-12 infrastructure crisis. The 21st Century School Fund (21CSF) and the University of California-Berkeley's Center for Cities + Schools (CC+S), in partnership with the National Council on School Facilities and the Center for Green Schools at the U.S. Green Building Council, launched the *Planning for PK-12 Infrastructure Initiative* (P4si Initiative) in 2016.



Civic



Governmental



Building Industry



Public Finance



Labor



University

In Phase 1 of the P4si Initiative (Fall 2016), a research team from 21CSF and CC+S facilitated a structured national engagement process to identify the challenges to adequacy and equity in PK-12 infrastructure and to propose system reforms. Our process garnered input from 85 leaders from 33 states and the District of Columbia who represented a diverse group of non-profit advocacy leaders, local and state officials, researchers, building industry professionals, labor advocates, and finance experts.

Priority Actions for Systemic PK-12 Infrastructure Reform

There are 55 priority actions identified to address the systemic problems of delivering adequate and equitable public school facilities. These priority actions will support the essentials of a comprehensive local, state, and federal system for adequate and equitable PK-12 infrastructure. They were synthesized and selected from 200 solution ideas generated through our process and are considered to have the greatest potential for development, replication, and scaling.

P4si Initiative Phase 2: Implementing Systemic Reforms

Phase 2 of the P4si Initiative will move the 55 priority actions forward to achieve a paradigm shift in our PK-12 public infrastructure systems. We are working to secure public and private investments to advance the systems reforms identified in these priority actions. This is ambitious work. However, we have seen that when there is a shared responsibility for adequacy and equity amongst the civic, government, and private sectors, our public school places can be transformative. And only with this joint responsibility for facilities that promote the educational success of our children, can our communities ultimately thrive.

Convene
leadersDefine
problemsIdentify
impactsTheorize
causesGenerate solution
ideasPrioritize
actions

Essentials for Modern PK-12 Public Infrastructure Stewardship

Governance and decision making

- Well-developed codes, policies, and regulations that articulate and designate the local, state, and federal roles and responsibilities for PK-12 facilities
- Defined and transparent systems for public reviews and approvals
- Compensatory systems for allocating facilities funding to low-wealth and disenfranchised communities

Facilities funding

- Dedicated, stable, and adequate revenues for capital funding
- Dedicated, stable, and adequate operating funding for facilities operations, maintenance and repairs
- The capacity and authority to leverage public assets and private equity to generate new capital for local district facilities
- Low cost credit and reasonable fees for local district borrowing
- State and federal capital funds to supplement local effort and need

Facilities management

- Adequate funding with clear priorities
- Local school district and state government mission statements and strategic plans that include school facilities
- Well trained and experienced facility managers and labor personnel, with adequate compensation
- Technology tools that support facilities management and maintenance functions
- Systems and protocols for open communication between the many stakeholders associated with and affected by school facilities

Facilities planning

- Robust public engagement
- Mandates, standards, guidance, and funding for regular operations, maintenance, capital, and educational facilities master planning
- Training and support of district staff for effectively engaging a broad set of local stakeholders
- School district authority, requirements, and resources for planning across other affected public agencies, regions, and sectors

Data and information

- Standardized and relevant facilities data collection at federal, state, and local levels
- Public access to facilities data and information
- Timely analysis of facilities data and information to inform decisions
- Integration of facilities data and information with other school, community, and fiscal data and information

Facilities accountability

- Standards for facility planning, management, and equity
- Standards for design, condition, utilization, and location of public school facilities
- Meaningful metrics that can be used for comparisons across schools, districts, and states
- Consequences for school districts whose facilities management practices result in unhealthy and/or unsafe conditions for occupants
- Consequences for school districts and contractors whose practices contribute to waste, fraud, or abuse of public funds

55 Priority Actions For Systemic Reform

GOVERNANCE AND DECISION MAKING

1. Establish local education and municipal policies to ensure effective delivery of public school facilities
2. Establish a facilities office in each state department of education or as an independent state agency
3. Guide state facilities decisions with an independent advisory committee
4. Provide state financial, technical, and training assistance to local school districts
5. Establish state policies to support local government inter-agency capital planning and development
6. Develop model legal contracts for innovative PK-12 infrastructure partnerships
7. Establish a facilities office in the U.S. Department of Education, with a strategic national focus on equity
8. Support PK-12 facilities research, guidance and technical assistance in all relevant federal agencies
9. Establish local policies to guide fair and efficient facilities decision-making and approval processes

OPERATING AND CAPITAL FACILITIES FUNDING

10. Create and maintain a dedicated maintenance fund for routine and preventive maintenance
11. Incorporate better systems for using “pay-as-you-go” funding for capital renewals
12. Reduce state legal barriers that limit local school districts from raising local revenue
13. Enact state legislation to provide school districts the flexibility to raise revenue from sources other than property tax
14. Establish dedicated state revenue streams for repayment of PK-12 capital improvement bonds
15. Facilitate partnerships between school districts and community colleges and universities
16. Establish a federal-state partnership with a PK-12 infrastructure “revolving fund”
17. Ensure Every Student Succeeds Act (ESSA) permits states the flexibility to allow and regulate local district securitization of up to 10% of their federal Title I Funds for major repairs
18. Incorporate public school infrastructure in any federal infrastructure initiative
19. Establish federal programs to fund states for capital construction for PK-12 infrastructure

FACILITIES MANAGEMENT

20. Incorporate the values and vision for adequate and equitable school buildings and grounds into the school district’s mission, vision, and strategic plans
21. Establish regular lines of communication between school district program/curriculum staff and facilities staff
22. Provide relevant building condition system data to facilities maintenance and operations personnel
23. Establish a regular maintenance and operations reporting system for facilities personnel
24. Provide adequate staff training and ongoing technical support for facilities staff
25. Develop facility lifecycle costing templates, methods, and standards for school district management
26. Adopt standard processes for capital project management that is documented in a procedures guide
27. Establish a clear 1-2 page “project charter agreement” for every capital project
28. Require a web-based project management information system
29. Conduct facilities workshops for parents and community members about facilities planning and decision making
30. Adequately staff state facilities offices for their data management, planning, technical assistance, and oversight responsibilities

FACILITIES PLANNING

31. Require every district to have an up-to-date five-year master facilities plan guided by public engagement and available online
32. Include school district facilities master plan requirements for the outdoor space on school campuses
33. Establish a school district facilities planning office or designee responsible for community and school engagement
34. Prepare annual districtwide maintenance, repair, and energy management plans and schedules
35. Coordinate school district and school specific facility capital and maintenance plans
36. Define and disseminate benchmarks for local PK-12 facilities planning
37. Provide technical assistance and tools for school districts on community and civic engagement best practices

DATA AND INFORMATION

38. Train and educate school administrators, school boards, and other stakeholders on the importance of facility planning
39. Require local, state, and federal facility data collection and sharing
40. Structure school district facility information systems to facilitate the aggregation and use of cross-functional data
41. Structure school district facility data systems to link to other local government data systems
42. Maintain a publicly accessible state facilities inventory of school district buildings, grounds, and other district owned land or facilities
43. Include basic data on public school facilities in the Common Core of Data of the National Center for Education Statistics
44. Use software tools and services that facilitate data collection, aggregation, and sharing
45. Build a shared and open data portal of facilities research, information, data, and case studies
46. Conduct a national “state of the field” analysis of local and state data collection on PK-12 facilities

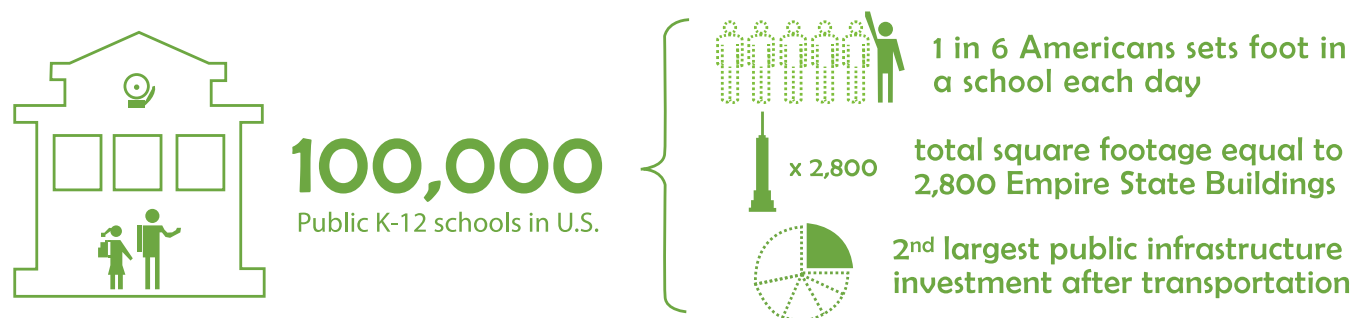
ACCOUNTABILITY

47. Establish standards for decision making on school facilities plans and projects
48. Adopt design and building performance standards and performance indicators
49. Conduct regular statewide assessments of PK-12 school facilities
50. Require third party commissioning of new schools and newly renovated building systems
51. Conduct regular inspections of school facilities for health and safety
52. Conduct process, budget, and quality monitoring and audits of school construction, major renovation and systems renewal projects
53. Share school-level facilities data and assessment findings in real time with school-level staff
54. Develop a Facility Quality Index that utilizes facilities data and school and education data
55. Translate building industry and academic research for facilities practitioners

THE POWER OF PUBLIC PLACE

PK-12 School Facilities Infrastructure

The transfer of knowledge from one generation to another through education is an essential social responsibility requiring substantial facilities infrastructure. Nearly 50 million children and another 6 million teachers and other adults — 1/6th of the U.S. population — are in public school buildings every school day. Nationally, our public school districts are responsible for an estimated 7.5 billion gross square feet of buildings and 2 million acres of school grounds. Just as roads and bridges are necessary for mobility, school buildings and grounds are necessary for education. Both transportation and education infrastructures are vital to our democracy and cornerstones of economic strength. We need effective and efficient systems to ensure responsible stewardship of our PK-12 public school infrastructure.



Public School Facilities Have Broad Impacts

Because of the importance of public education and the effects of school locations, design, and condition on children and communities, it is imperative that our public school facilities are healthy, safe, educationally appropriate, environmentally sustainable, and community-accessible, no matter the wealth of families or community.

✔ Student, Staff, and Community Health

Properly planned, designed, and maintained school facilities promote the health and well-being of children and adults in schools. Well-planned and designed schools increase safety by being easier to supervise and monitor, both internally and against outside intruders. Schools that make their indoor and outdoor facilities available to communities after school hours for physical activity and other health-promoting community activities support community well-being.¹ Researchers at the Harvard School of Public Health recently wrote, the evidence is unambiguous — school buildings impact student health, thinking, and performance.² Exposures to mold, poor ventilation, uncomfortable temperatures, inadequate lighting, overcrowding, and excessive noise can harm students' health and contribute to absenteeism.³ The EPA estimates that 46% of schools in the U.S. have environmental conditions that lead to poor indoor air quality.⁴ Children, with their developing bodies, have sensitivities and vulnerabilities to such conditions — much more so than adults. Children are especially vulnerable to the harm of the many “legacy toxics” (such as lead, asbestos, PCBs, and others) found in schools built before the 1970s. The vast underinvestment in maintenance, repair, toxic substances removal, and upgrades of our PK-12 infrastructure exacerbates these negative conditions.

A+ School Quality and Academic Achievement

School facilities impact the delivery of education. Poor or substandard school buildings and grounds negatively affect the health of children and adults in schools, which in turn negatively affects their performance.⁵ Studies find significant correlations between poor structural, conditional, and aesthetic attributes of school buildings and low student learning and achievement.⁶ Schools without major maintenance backlogs have higher average daily attendance and lower dropout rates.⁷ Good facility conditions can also help reduce teacher turnover.⁸ Poor school facility conditions can also be a barrier to the basic delivery of education and to the implementation of any school reform.⁹ Today's school facilities need the physical elements essential to modern education, such as science labs, technology, and special education spaces. But school facilities that have not been modernized often lack these important educational spaces.

↑ Economic Development

Modern, high-quality PK-12 infrastructure strengthens communities in many ways. Facility modernizing programs increase local property values, boost school enrollments, and help rebuild confidence in struggling school districts. A major school renovation program in New Haven, Connecticut resulted in increased test scores, raised housing values, and increased enrollment.¹⁰ The work associated with managing PK-12 infrastructure involves thousands of contracts and millions of jobs, which boosts local economies. Collectively, America's school districts spend about \$100 billion per year on their facilities — in facility operations, maintenance, repair, renovation, and capital construction (including minor and major renovations and building entirely new school buildings) activities.¹¹ For every billion dollars invested in capital construction, there are an estimated 6,664 direct construction jobs, and another 11,121 indirect or induced jobs created. These contracts and jobs can especially benefit lower-wealth communities — providing an important co-benefit to school facilities improvement.¹²



Image credit: Jeff Vincent

🌲 Environment and Natural Resources

The massive scale of our public school district facility infrastructure has a major impact on the environment. Public schools include an estimated 2 million acres of land and 7.5 billion gross square feet of space¹³ — about half the building square footage of the entire commercial building sector in the U.S.¹⁴ Half of our school buildings are at least 50 years old. Buildings use 70% of U.S. electricity and generate 40% of carbon emissions. With current technology, buildings can be regenerative for the environment — or can, at the very least, reduce negative impacts. Retrofits, retro-commissioning, and proper energy management save taxpayer dollars by lowering school district utility expenditures. The U.S. Department of Energy reports that energy improvements to the nation's existing buildings could save 30% *overall*.¹⁵ Improvements to school facilities can also be engineered to generate energy as net zero energy schools, treat waste water, and retain storm water to improve our nation's water. Environmentally sustainable school facilities can also be used as science teaching tools and help students gain stewardship knowledge.

AMERICA'S PK-12 SCHOOL INFRASTRUCTURE CRISIS

Our country's elementary and secondary (PK-12) public school infrastructure is in crisis. Every day, millions of children in the U.S. attend public school in unhealthy, unsafe, educationally inadequate, environmentally unsustainable, and financially inefficient facilities.¹⁶ In addition, many school districts that have added new public schools to meet growing enrollments report that they cannot provide the routine and preventive maintenance necessary to keep these facilities in good repair.¹⁷ This is a run-to-fail approach with high costs for our future.

Deteriorated and neglected public school facilities can be found throughout the nation, but the most egregious school facility conditions are in low-wealth school districts and in neighborhoods serving children from low income families.¹⁸ Substandard public school facilities are problems shared by many rural areas and older urban centers. Fortunately, not all communities fall short. Many districts can, and do, provide inspiring school facilities for their children and communities. But the pervasive inequities between school districts remains a major challenge — sometimes leading to state-level court action to force remedies.¹⁹ In 2014, the U.S. Department of Education's Office for Civil Rights instructed states to remedy the disparities in public school facilities.²⁰ Because of the scale of our public education infrastructure and their broad impacts, America experiences enormous consequences for these disparities in school facility conditions, which harm the health and academic achievement of children.

Underlying Causes of the PK-12 Infrastructure Crisis

The crisis of public school facilities inadequacy and inequity is caused by limitations in our underlying political and administrative systems for facilities stewardship. All school districts have the same basic responsibilities for their facilities: facilities planning, design, and construction as well as responsibilities for the ongoing operations, maintenance, and repairs. However, the facilities policies, practices, and funding of local, state, and federal authorities are outdated and underdeveloped. In order to ensure all school districts can provide adequate and equitable public school facilities, all six elements of an effective PK-12 facilities system need to be developed and supported.²¹

Six Elements of Effective PK-12 Facilities Systems

- | | |
|--|------------------------------------|
| 1. Facilities governance and decision making | 4. Educational facilities planning |
| 2. Facilities operating and capital funding | 5. Facilities data and information |
| 3. Facilities management | 6. Public accountability |

Providing adequate and equitable teaching and learning environments for 1/6th of the entire U.S. population is complex and demands special knowledge, skill, authority, and resources. There are both technical and political factors that make progress toward responsible systems of stewardship for our public school facilities challenging. On the technical side, the built environment of schools serves many functions and require interdisciplinary skill sets. School facilities and their components have also been changing dramatically with advances in building-

related technology and new understandings of health-related effects of indoor environments. On the political side, the length of time for planning, design, and construction is multi-year and longer than many political and administrative tenures. Building deterioration also does not happen overnight. The reality of these long timeframes makes facility improvements a lower priority and easier to put off. Additionally, educators are often unfamiliar with facilities management and do not know how to leverage the effective stewardship of buildings and grounds into their school improvement strategies.

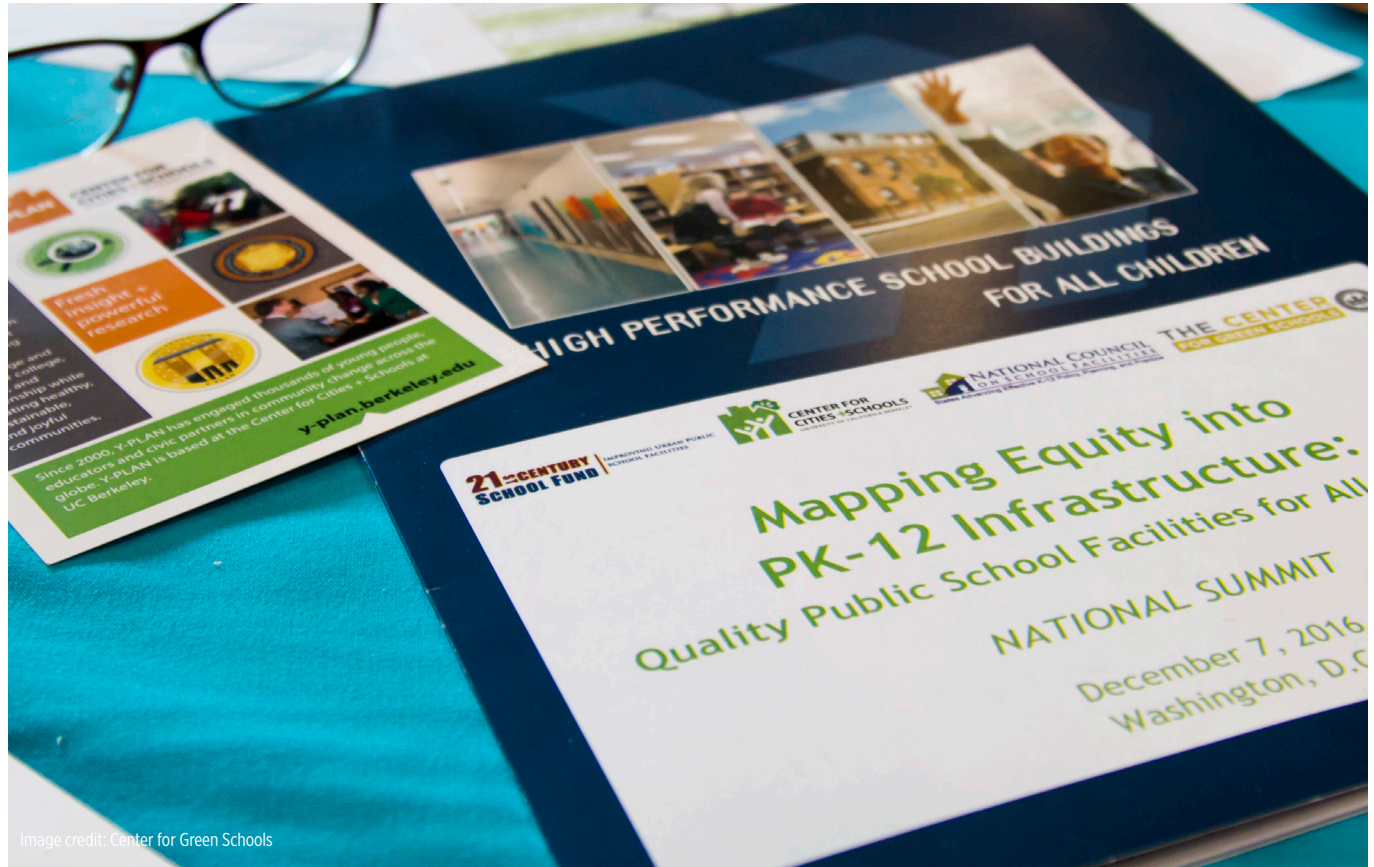


Image credit: Center for Green Schools

P4si INITIATIVE

A National Partnership for Systemic Reform

With much at stake, national leaders have come together to formulate a *systems-based* plan to address the PK-12 infrastructure crisis. The 21st Century School Fund (21CSF) and the University of California-Berkeley's Center for Cities + Schools (CC+S), in partnership with the National Council on School Facilities (NCSF) and the Center for Green Schools (CGS) at the U.S. Green Building Council, launched the *Planning for PK-12 Infrastructure Initiative* (P4si Initiative) in 2016.

This Leadership Team set an ambitious goal for the P4si initiative: accelerate efforts to reform and improve the PK-12 infrastructure systems to deliver healthy, safe, educationally appropriate, environmentally sustainable, and community accessible public school buildings and grounds for all children, no matter the wealth of their family or community.

Phase 1 builds on the deep experience our organizations have in improving public school facilities and our recent research findings on the state of the field. In 2016, 21CSF, NCSF, and CGS released *State of Our Schools: America's K-12 Facilities*, a national report that quantified the widespread structural funding deficit in our public school infrastructure.²² In 2015, CC+S released *Going it Alone: Can California's K-12 School Districts Adequately and Equitably Fund School Facilities?*, a study using a similar approach that looks deeper at school facility spending in California.²³ What these two studies document is the underlying and ongoing structural pattern of both inequitable investment and underinvestment in our PK-12 infrastructure that harms student health and achievement — and is sadly familiar to many students, teachers, and communities.

Building off these research findings and our collective decades-long work to improve public school facilities, our four organizations embarked on Phase I of the P4si Initiative to develop a comprehensive plan to reform the systems for delivering adequate and equitable public school infrastructure.

GUIDING PRINCIPLES

- Environments for children require special features, management and oversight
- Adequate and appropriate school facilities are essential to equitable access to educational opportunities
- Public governance and civic engagement in public K-12 school facilities is essential for public trust and support

P4si Phase 1 Research and Engagement Process

For Phase 1 of the P4si Initiative (Fall 2016), a research team from 21CSF and CC+S facilitated a structured national engagement process to identify the challenges to adequacy and equity in PK-12 infrastructure and to propose system reforms needed. Our process garnered input from 85 leaders from 33 states and the District of Columbia who represent a diverse group of non-profit advocacy leaders, local and state officials, researchers, industry professionals, labor advocates, and finance experts.



Civic



Governmental



Building Industry



Public Finance



Labor



University

Participants' engagement and input focused on four objectives: a) defining the *problems* in school facilities specific to the essential elements; b) identifying the negative *impacts* of these problems; c) theorizing about the underlying causes of the problems; and d) generating systemic solutions that address the underlying causes of the problems identified. Through this process, we developed detailed problem analyses for each essential element and generated more than 200 solution ideas to support modern systems for good stewardship of public school facilities.



Convene
leaders



Define
problems



Identify
impacts



Theorize
causes



Generate solution
ideas



Prioritize
actions

Next, over 3 days of facilitated meetings in Washington, D.C. in December 2016, these leaders worked together to prioritize the solutions identified. The research team synthesized the results into the findings in this report — descriptions of the basic elements of effective systems and 55 Priority Actions for reforming local, state and federal policies and practices. (Appendix A describes our mixed-method research and engagement strategy and Appendix B lists the participants.)

55 PRIORITY ACTIONS

for Systemic PK-12 Infrastructure Reform

The 55 priority actions were identified to address the systemic problems with delivering adequate and equitable public school facilities. They include proposals for policy and practice reforms at the local, state, and federal levels. These priorities have implications for stakeholders from civic, governmental, labor, academic, and private sectors. Prioritized from the 200 solution ideas generated through our process, these 55 priority actions have the greatest potential for development, replication, and scaling to improve the systems for adequacy and equity of our PK-12 infrastructure.

1. Facilities Governance and Decision Making

The Problem: A disjointed patchwork of local, state, and federal roles and responsibilities governs the conditions, funding, and oversight of public school facilities. This fragmented system of governance and accountability leaves most local school districts with the sole responsibility for their school facilities, even when they do not have the resources to be responsible stewards of these assets. It also means that there is little accountability and neither the public nor the private sector stakeholders have recourse for poor decisions made locally. As a result, public confidence in management and taxpayer willingness to support bonds or appropriations for public school facilities are frequently low.

It doesn't have to be this way.

When there is a system of governance for PK-12 public school facilities with clearly defined local, state, and federal responsibilities: the public is more willing to support facilities requirements; more contractors will want to participate in public sector work; low-wealth urban and rural communities no longer bear the funding burden on their own; and the quality of school facilities is likely to be more equitable across jurisdictions. Paramount to the success of our vision and the rationale for our recommendations for governance and decision making is understanding that providing adequate PK-12 school facilities for all children is a *shared responsibility*—with different, but important roles for local, state, and the federal governments.



Washington, DC: A. Kiger Savoy Elementary School built 1968, fully modernized 2009.
Image credit: 21st Century School Fund, Bowie Gridley Architects

PRIORITY ACTIONS — FACILITIES GOVERNANCE AND DECISION MAKING

1. **Establish local education and municipal policies** that support an effective system for delivery of public school facilities, to include policy associated with facilities data collection and sharing, planning, governance and decision making, management, funding and accountability.
2. **Establish a facilities office in each state department of education or as an independent state agency with capacity to set** facilities standards, collect facilities data, and provide financial, technical, and training support to local districts.
3. **Guide state facilities decisions with an independent advisory committee** of individuals with health, education, environmental and finance backgrounds as well as end user stakeholders.
4. **Provide state financial, technical, and training assistance to local school districts on facility planning tasks.** Important tasks include facility assessments, enrollment projections, facilities master planning, and joint use development and management.
5. **Establish state policies/guidelines to inter-agency and regional capital planning and development.** Enable joint development opportunities that combine other compatible municipal service delivery sites (e.g., libraries, senior centers, etc.) with schools.
6. **Develop model legal contracts for innovative PK-12 infrastructure partnerships.** Priority model contracts might include those in support of inter-agency development, pay for success, energy or other performance contracting, and public-private joint development partnerships.
7. **Establish a facilities office in the U.S. Department of Education,** with a strategic national focus on school facilities that collects basic facilities inventory data, supports research, helps define minimum facilities standards, and communicates effective practice.
8. **Support research, guidance, and technical assistance on public school facilities in other federal agencies,** including the Environmental Protection Agency, the Department of Energy, the Department of Agriculture, the Department of Housing and Urban Development, and the Federal Emergency Management Assistance department.
9. **Establish local policies to guide fair and efficient facilities decision-making** and approval processes that require both school and community engagement as well as transparency regarding: planning, financing, design, procurements and contracts, school consolidations and closings, attendance zones, and student assignment.

Shared Responsibility: Local, State, and Federal

The education of our children is both an intensely personal responsibility and a public one. While parents have responsibility for the health, safety, education, and future success of their children, so too do the community, the state, and the nation. Control of our more than 14,000 public districts by local school boards has long been a hallmark trait of the U.S. public education system.

Local school districts hold the direct responsibility for the delivery and management of public school facilities. However, while every school district aims to provide its children with a good education, the local capacity to deliver adequate facilities varies widely from school district to school district. The result is that school facilities conditions in some communities are unhealthy,

unsafe, and educationally substandard, while they are inspiring and meet all modern health and safety standards in others. This structural disparity necessitates redefining and realigning local, state, and federal interests, roles, and responsibilities in order to provide adequate and equitable facilities for all children. Ensuring local control of our public school facilities should not mean that districts have to shoulder all responsibility for facilities alone.²⁴

State Interests, Roles, and Responsibilities

While local school districts have the day-to-day responsibility for managing their facilities, states often play important roles in supporting local school districts with their facility responsibilities. However, there is tremendous variation in how states express their interests in the adequate and equitable provision of public school buildings and grounds. For example, 12 states provided zero capital funding for PK–12 facilities in the years 1994–2013. In these states, the responsibility was entirely local, with little-to-no state involvement. The other 38 states provided varying levels of capital funding each year to local school districts, ranging from 2% to 100% of capital expenditures as reported by local school districts.

In total, for the years 1994 to 2013, local school districts in the U.S. raised 82% of their capital outlay locally, while state governments contributed 18% and the federal government contributed almost no resources.²⁵

Funding Sources of U.S. Public K–12 School Construction Capital Outlay: Fiscal Years 1994–2013



Source: Filardo, M. 2016. State of Our Schools: America's PK–12 Facilities 2016. Washington, D.C.: 21st Century School Fund, National Council on School Facilities and Center for Green Schools. Data source: Local Education Agency (School District) Finance Survey (F-33) published by National Center for Education Statistics (NCES) in the Common Core of Data (CCD), 1994–2013.

Our national experts and leaders identified state governments as critical to ensuring adequate and equitable public school facilities across school districts and communities. For many states, the responsibility for adequacy and equity in public education is grounded in their state constitution. In nearly half of the states, courts have had to clarify that school facility conditions do indeed fall under the domain of state responsibility.²⁶ However, this state responsibility varies tremendously in policy and practice.²⁷

Key state responsibilities for school facilities adequacy include: collecting facilities data and information, adopting standards, monitoring facilities conditions, providing technical assistance to districts, training facilities personnel, and helping to fund school capital construction. A state role is essential to ensuring that facility disparities do not undermine the achievement of specific groups of students.²⁸ Another important state role can be to encourage, support, and require connections among state health, education, environment, transportation, and economic development agencies.²⁹

An Appropriate Federal Role

Our national experts and leaders did not think that our system of local control of public education and state responsibilities should mean that local school districts are left to shoulder the cost of their facility infrastructure alone. Rather, a system of shared responsibility for all aspects of good stewardship is needed by local, state, and federal entities. With this shared

responsibility, all school districts, regardless of size or wealth, rural or urban, can provide equal educational opportunities for students.

Federal funding of PK-12 infrastructure is needed to help the communities with the greatest facility-related burdens and the least ability to meet those needs. There are districts and states with insufficient financial resources to address accumulated facility deficiencies and legacy hazards, such as lead in paint and plumbing; asbestos in flooring, walls and ceilings; and PCBs in lighting and caulk. Other states and districts have been overwhelmed by enrollment growth and thus neglected the renovation of their existing school facilities.

A defined federal PK-12 infrastructure funding program targeted to the worst buildings and the highest need students and communities could help leverage additional local, state, and even private funding for school facility planning and investment. In addition, federal data collection and research could help bring much needed knowledge and increased professionalism into the PK-12 infrastructure field. The federal interest in supporting PK-12 facilities is tied both to the nation's overall interest in the well-established benefits that education brings to our nation's democracy and prosperity as well as to the jobs and fiscal efficiencies that responsible stewardship of public infrastructure creates.

Governance and decision making essentials

- Well-developed codes, policies, and regulations that articulate and designate the local, state, and federal roles and responsibilities for PK-12 facilities
- Defined and transparent systems for public reviews and approvals
- Compensatory systems for allocating facilities funding to low-wealth and disenfranchised communities

2. Operating and Capital Facilities Funding

The Problem: Our system for funding public school infrastructure leaves millions of children and teachers in unhealthy, unsafe, and obsolete public school facilities. The levels of capital financing and annual operating funding from local revenues are unstable and inadequate in all but the wealthiest school districts. Deferred maintenance and delayed capital renewals and new construction means that school districts frequently end up overspending from their operating budget on facility emergencies, utilities, and repairs. Doing so unnecessarily takes money from other areas of educational delivery. Thus, without adequate capital investment in facilities, many districts simply cannot provide the quality of learning environments that children need. At the same time, insufficient funding for routine and preventive maintenance and minor repairs, means that facilities systems and components do not last as long as they are supposed to. Inadequate funding for public school infrastructure falls heaviest on small school districts serving low-wealth communities with aging buildings and high-need populations, be they in rural areas, towns, cities, or in our older suburbs.

It doesn't have to be this way.

When school districts have adequate and stable capital funding, they can provide healthy, safe, educationally appropriate facilities for their community. They make their facilities environmentally sustainable and accessible to community members for civic use. Districts are less likely to overspend on emergencies, utilities, and repairs from their operating budgets. Adequate and

stable facilities funding enables district and contract personnel to responsibly operate and maintain the teaching and learning environments in the school buildings and grounds.

PRIORITY ACTIONS — OPERATING AND CAPITAL FACILITIES FUNDING

- 10. Create and maintain a dedicated maintenance fund** in each state to ensure school districts do the necessary routine and preventive maintenance for healthy and safe environments in schools.
- 11. Incorporate better systems for using “pay-as-you-go”** funding for capital renewals to reduce the overall costs of facilities by eliminating financing and debt costs associated with a portion of a district’s capital projects.
- 12. Reduce legal barriers in state law that limit local school districts from raising local revenue** from bonds (e.g., debt limits that are too low to allow for adequate facilities capital investment, high voter approval thresholds for local bond referenda, etc.).
- 13. Enact state legislation to provide local school districts the flexibility to raise revenue** from sources other than property tax.
- 14. Establish dedicated state revenue streams** to ensure the repayment of long term bonds that finance PK-12 capital improvement projects and new construction.
- 15. Facilitate partnerships between school districts and community colleges and universities** to leverage multiple uses on their properties, raise revenue, and increase capacity for PK-12 facilities construction and management.
- 16. Establish a federal-state partnership** with a PK-12 infrastructure “revolving fund”—such as with bond banks—that gives priority and technical assistance to low wealth school districts.
- 17. Ensure that the federal Every Student Succeeds Act (ESSA) permits states the flexibility to allow and regulate local district securitization of up to 10% of their federal Title I Funds** for major repairs and major maintenance of their facilities.
- 18. Incorporate public school infrastructure in any federal infrastructure initiative** and ensure that a portion of federal infrastructure resources are dedicated toward low-wealth and high-need public education infrastructure.
- 19. Establish federal programs to fund states PK-12 facilities modernization and new construction capital projects** to ensure low-wealth communities with high-need facilities can make their facilities healthy, safe, educationally appropriate, and environmentally sustainable.

Inadequate and Inequitable Funding and Conditions

The U.S. has a major and ongoing annual structural deficit in PK-12 infrastructure investment. We do not spend nearly enough to ensure that all our school facilities are healthy, safe, in good repair, and properly support the educational program. Each year, about \$100 billion in public dollars is spent for maintenance, operations, repair, and capital construction of the nation's public K-12 school infrastructure. Yet, there is a *\$46 billion annual gap* between what is spent each year and what should be spent each year to meet modern industry standards for responsible facilities stewardship.³⁰

Not every community is suffering with substandard school facilities. There are millions of children across the country in state-of-the-art facilities. However, deficiencies and substandard conditions exist in many districts that leave students and school personnel at risk for adverse health and education outcomes. The districts with blighted public school infrastructure, who have not been able to make needed capital investments in their facilities, are paying more for energy, emergencies, maintenance and repairs. The reliance of districts on their property tax base as their sole source of school infrastructure funding restricts what they can accomplish and exacerbates inequities.

Facilities funding essentials

- Dedicated, stable, and adequate revenues for capital funding
- Dedicated, stable, and adequate operating funding for facilities operations, maintenance and repairs
- The staff capacity and authority to leverage public assets and private equity to generate new capital for local district facilities
- Low cost credit and reasonable fees for local district borrowing
- State and federal capital funds to supplement local effort and need

3. Facilities Management

The Problem: While inadequate facilities funding is a major problem, many school districts across the county do not optimize the facility investment resources they do have. Districts too often neglect routine and preventive maintenance, which then backlogs and becomes more expensive over time. Management of capital construction projects often suffers from under-supported and/or untrained staff. At the state level, when departments of education have facilities offices, they are routinely under-staffed for the levels of responsibility required to support local school districts. This particularly affects the very small and the highly-burdened school districts. At the federal level, there is only one staff person associated with our nation's public school facilities—the person charged with management of the Green Ribbon Schools Program. The root of these staffing challenges stems from the fact that stewardship for adequate and equitable facilities is seldom explicit in the vision and mission of public education at the local, state, or federal levels.

It doesn't have to be this way.

When school districts incorporate facilities standards into their educational vision and mission; and when school facilities managers have the authority, expertise, and resources to anticipate and address challenges; then the full value of facilities investments is realized. A proper, non-crisis management approach allows for limited resources to be aligned to the greatest needs and highest priorities.

Our current PK-12 facilities management system needs increased levels of support to meet the complexities and challenges it faces. There are endless management responsibilities for housing students and staff. The priority management actions developed by our working group experts are proposed to increase the value and effects of the extensive work already being done by local school district staff.

PRIORITY ACTIONS — FACILITIES MANAGEMENT

- 20. Incorporate the values and vision for adequate and equitable school buildings and grounds** into the school district’s mission, vision, and strategic plans.
- 21. Establish regular lines of communication between school district program/curriculum staff and facilities departments** so that they may collaboratively plan and manage physical learning environments in ways that enhance teachers’ instructional effectiveness and student performance.
- 22. Provide relevant building condition/system data to facilities maintenance and operations personnel** to better enable them to effectively schedule and implement maintenance, repairs, and improvements.
- 23. Establish a regular maintenance and operations reporting system** for facilities personnel to capture specific problems faced in successfully operating and managing newly-designed and in-place systems.
- 24. Provide adequate maintenance staff training and ongoing technical support** for the operations, maintenance, and repair of “high tech” building system components, and assess the sophistication of new buildings systems and components before purchase, to make sure they can be properly maintained.
- 25. Develop facility lifecycle costing templates, methods, and standards** for school district management.
- 26. Adopt a standard process for capital project management** that is documented in a procedures guide with an appropriate timeline allowing for real-time transparency and accountability throughout the process.
- 27. Establish a clear 1-2 page “project charter agreement” for every capital project.** A Project Charter broadly but clearly defines the project quality, scope, guiding principles, major project phases, primary and secondary objectives, completion dates and key milestones, as well as project costs, other constraints, assumptions and concerns. The charter should be developed through consensus, subject to authorized change, and be signed by the responsible parties.
- 28. Require a web-based project management information system** to support facilities planning, design, and construction; coordinate and streamline approvals; ensure transparency; and improve communications in real-time among diverse parties and stakeholders. The system helps to organize all documents and provides reports on all levels, including project cost forecasting, scheduling, and change orders.
- 29. Conduct facilities workshops aimed at parents and community members** about facilities planning and decision making.
- 30. Adequately staff state facilities offices** for their data management, planning, technical assistance, and oversight responsibilities.

Balancing Public and Private Sector Facilities Services

Unlike instruction, which is largely provided by public school districts and their staffs, much of the management and delivery of the nation's 100,000 public school facilities-related services are contracted out to private firms. School district business officials often find themselves managing a mixture of public employees—custodians, building engineers, and repair workers—and multiple private contractors. Like instruction, school facilities operations and maintenance is usually provided by in-house staff of custodians, building engineers, and repair workers organized by school district supervisors and managers. However, these functions are far more likely to be contracted out by districts than they were 10 years ago. As building services, systems, and facilities management become more technically complex, many school districts contract out basic functions like cleaning, energy management, HVAC servicing, minor repairs, and pest control, rather than invest in training and support for in-house personnel.

Nearly all school districts contract out design, engineering, and construction of facilities. Increasingly, even the management of the capital construction programs themselves are outsourced to private construction management firms. Procurement laws and regulations are changing to allow new types of contracts, such as design/build, performance contracts, pay-for-success, and construction management at-risk. But the school district is ultimately responsible to the public for the quality, scope, schedule, and cost of their capital projects. School district procurement and capital project managers need the support, experience, authority, and pay comparable to the contractors they must oversee.

Facilities management essentials

- Adequate funding with clear priorities
- Local school district and state government mission statements and strategic plans that include school facilities
- Well trained and experienced facility managers and labor personnel, with adequate compensation
- Technology tools that support facilities management and maintenance functions
- Systems and protocols for open communication between the many stakeholders associated with and affected by school facilities



Images credit: Concordia, LLC

4. Educational Facilities Planning

The Problem: School districts often do not do nearly enough planning for their facilities. Without adequate plans, school districts can only react to facilities problems rather than anticipate them and mitigate them in a timely fashion. As a result, districts pay more to operate facilities and for their capital improvements or new construction. A lack of planning also means that facilities decisions are overly politicized, and often facilities spending is inequitable. Spending on poorly planned school facilities causes communities to lose important benefits that could have been realized through their investments.

It doesn't have to be this way.

School district educational facilities planning enables districts and communities to align their resources to their needs. It also provides an opportunity to create a shared vision for the future, not just of a school building, but of a community. Additionally, when facilities plans are developed in partnership with a broad and diverse set of school and community stakeholders, districts often find innovative ways to meet their programmatic and building needs. Authentic community engagement in school facility planning can also be a catalyst for social capital and increase community participation in local schools.

PRIORITY ACTIONS — EDUCATIONAL FACILITIES PLANNING

- 31. Require every district to have an up-to-date five-year master facilities plan** guided by public engagement and available online.
- 32. Include school district facilities master plan requirements for the outdoor space on school campuses** that will support experiential education; physical activity, athletics and outdoor play; environmental design; and public use.
- 33. Establish a school district facilities planning office or designee** responsible for community and school engagement.
- 34. Prepare annual districtwide maintenance, repair, and energy management plans** and schedules that are realistic, holistic, and have been developed with stakeholders and contractors.
- 35. Coordinate school district and school specific facility capital and maintenance plans,** ensuring that school building users, custodians, engineers, and capital planning staff engage in coordinated planning on a regular basis.
- 36. Define and disseminate benchmarks for local PK-12 facilities planning** that focuses on procedural requirements, stakeholder engagement, data analysis, decision-making processes, and transparency.
- 37. Provide technical assistance and tools for school districts on community and civic engagement** best practices.
- 38. Train and educate school administrators, school boards, and other stakeholders on the importance of facility planning** and how to run a community engagement process with the right mix of community and technical input.

Planning Results in High Value for Least Cost

High quality — and even adequate — school infrastructure does not just happen; it must be planned. Based on extensive experience in the field, there was strong consensus among our participants that educational facilities planning for operations, maintenance, and capital projects provides high value at low cost. Facility planning processes cost a small fraction of an overall facility operating or capital budget but can have profoundly positive effects on maintenance, operations, and the quality of design and construction.

However, low-wealth and high-need school districts and communities often inadequately plan or neglect the planning process altogether. Instead, they respond to the facility problems immediately in front of them, rather than working with their stakeholders to step back and acknowledge, understand, communicate, and take responsibility for the conditions their community is faced with.

There is always demand and need for building improvements. However, when community planning processes are a regular part of a school district's facility program, scarce funds can be more readily directed to the highest needs.

Facilities planning essentials

- Robust public engagement
- Mandates, standards, guidance, and funding for regular operations, maintenance, capital, and educational facilities master planning
- Training and support of district staff for effectively engaging a broad set of local stakeholders
- School district authority, requirements, and resources for planning across other affected public agencies, regions, and sectors



Images credit: 21st Century School Fund

5. Facilities Data and Information

The Problem: Facilities data collection, quality, analysis, and access fall drastically short in many school districts, most states, and nationally. The result is a poorly informed public, overly politicized facilities planning and decision making, inefficient management, little accountability for facilities conditions, and insufficient research to understand the health, education, and community impacts of PK-12 infrastructure.

It doesn't have to be this way.

Open access to facilities data fosters a better-informed public and helps keep public and private sectors accountable for facilities conditions. When states and local communities have access to quality data and informed analyses, facility plans are better informed and less politicized. The public and private sectors can be held accountable for facilities conditions, and communities can better understand the health, education, and community impacts of their PK-12 infrastructure investments.



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PRIORITY ACTIONS — FACILITIES DATA AND INFORMATION

- 39. Require local, state, and federal facility data collection and sharing**, appropriate to their roles and responsibilities.
- 40. Structure school district facility information systems to facilitate the aggregation and use of cross-functional data** (including user surveys) to increase the power of collected information.
- 41. Structure school district facility data systems to be linked with other local government data systems** on parks, land use, community development, etc.
- 42. Maintain a publicly accessible state facilities inventory of school district buildings, grounds, and other district owned land or facilities** that is integrated with state department of education school-level data and other public agency data, such as health, open space, energy use, and public safety.
- 43. Include basic data on public school facilities in the Common Core of Data** of the National Center for Education Statistics.
- 44. Use software tools and services** that facilitate the collection, aggregation, availability, and sharing of consistent and relevant data on school facilities from local school districts. Important elements include consistent data configuration, common data definitions, and standardized categorization, as well as better technology protocols for data configuration and communication between different information systems.
- 45. Build a shared and open data portal that captures research, information, data, and case studies of effective school facilities policy and practice** for the different contexts of schools, communities, school districts, and states.
- 46. Conduct a national “state of the field” analysis of local and state data collection on PK-12 facilities.** Study should aim to identify national best practices, useful technical tools, and data schema.

Facilities Data and Transparency is in the Critical Path of Progress

Effective educational facility planning, management, and accountability cannot be done without good data and information. The participation of knowledgeable stakeholders is essential to sound planning. Stakeholders who are armed with high quality data and information will develop better plans, make better decisions, and provide better oversight with data, than they can without it. A critical management responsibility is to set priorities. These day-to-day choices that allocate scarce labor and materials will fall short without timely, appropriate data. There can also be no real accountability without the public and officials responsible for oversight having access to data and analysis of facilities conditions and equity.

Data and information essentials

- Standardized and relevant facilities data collection at federal, state, and local levels
- Public access to facilities data and information
- Timely analysis of facilities data and information to inform decisions
- Integration of facilities data and information with other school, community, and fiscal data and information

6. Accountability

The Problem: Without systems for accountability that include enforcement: public trust in school district facilities management is low; inequities and inefficiencies are often unidentified or can be ignored; and waste, fraud, and abuse are hard to prevent. But of even greater concern, there are no agencies with specific monitoring and enforcement responsibilities for protecting children from health hazards found in their school environments.³¹

It doesn't have to be this way.

When local, state, and federal entities have standards for school siting, design, construction and maintenance it is possible to assess the adequacy and equity of school buildings and grounds. With internal controls and external oversight of school facilities management, the district is better able to manage the balance of private and public interests. When facilities are a part of the overall education accountability framework, resource allocation of operating funds will be better informed. With enforcement policies and resources for incentives and deterrents, districts will secure needed focus for good stewardship of their public school infrastructure.



Image credit: Gainesville Area Chamber of Commerce

PRIORITY ACTIONS — ACCOUNTABILITY

- 47. Establish standards for decision making** on school facilities plans and projects to ensure transparency and community engagement with consequences for not following required protocols and standards.
- 48. Adopt design and building performance standards and performance indicators** for aspects of the building that concern educational adequacy, including how the building supports teachers' instructional effectiveness and students' learning, well-being, and academic performance.
- 49. Conduct regular statewide assessments of PK-12 school facilities**, including for maintenance and operations, minimum design standards, condition, and utilization using standardized key performance indicators, and make the assessments publicly available.
- 50. Require third party commissioning of new schools and newly renovated building systems** to ensure systems work as promised and staff are trained to operate and maintain them to operate as they were designed.
- 51. Conduct regular inspections of school facilities for health and safety requirements** against a statewide checklist/inventory of all available data on school facility conditions to understand immediate environmental health hazards.
- 52. Conduct process, budget, and quality monitoring and audits** of school construction, major renovation and systems renewal projects to ensure compliance with facilities standards, good procurement practice, and fiscal responsibility.
- 53. Share school-level facilities data and assessment findings in real time with school-level staff** (e.g., principals, teachers, and building engineers) so that school-level personnel can verify problems identified and track progress toward remedies.
- 54. Develop the framework and metrics for a Facility Quality Index** that brings facilities data and school/education data together. An FQI should use key indicators, measures, and benchmarks of facilities quality, including for both conditions of the buildings and grounds and the ways in which these facilities support educational programs and related activities.
- 55. Make relevant building industry and academic research available to practitioners so that** they can apply current knowledge and effective practices to their responsibilities for health, safety, efficiency and equity.

Paying Attention Helps Districts Meet Adequacy and Equity Challenges

The physical condition of public school facilities is not integrated into local, state, or federal public school accountability systems. Thus, too little attention is paid to anticipating and planning for buildings and grounds. Instead, precious time and money is wasted reacting to facility emergencies and deficiencies, belatedly responding to enrollment growth and decline, and missing the need and opportunities for redesign and reuse. The local, state, and federal policies necessary for preventing these problems are simply too often not in place.

Facilities accountability essentials

- Standards for facility planning, management, and equity
- Standards for design, condition, utilization, and location of public school facilities
- Meaningful metrics that can be used for comparisons across schools, districts, and states
- Consequences for school districts whose facilities management practices result in unhealthy and/or unsafe conditions for occupants
- Consequences for school districts and contractors whose practices contribute to waste, fraud, or abuse of public funds



Image credit: Shutterstock

P4SI INITIATIVE PHASE 2

Implementing Systemic Reforms

Remedying the widespread inadequacies and inequities in PK-12 infrastructure will not be easy. Effective stewardship of our public school facilities is complicated and technical. It is also legitimately political. The good news is that Phase 1 of the P4si Initiative created a road map for systemic PK-12 infrastructure reform that will deliver adequate and equitable public school facilities for all children. Precisely which priority actions are necessary for each community, school district, or state will vary. But the main highways are the same. These are: appropriate local, state and federal governance and funding; effective facilities planning and management; and relevant facilities data and information supporting public accountability.

Phase 2 of the P4si Initiative is working to secure public and private investments to accelerate progress toward systems for adequate and equitable PK-12 infrastructure. Specifically, the P4si Initiative is seeking partners and investors to move the 55 priority actions forward and help:

- **Raise awareness** of the nexus between school facilities infrastructure and: education quality, health and health equity, community investment, the environment, and social justice.
- **Expand local, state and national networks, coalitions, and collaborations** to advance the priority actions developed from this engagement process.
- **Create information systems** for comparable data and metrics to better advocate for, manage, and understand public school infrastructure and its impacts on society.
- **Conduct policy, legal, finance, and governance feasibility studies** on implementing specific priority actions.
- **Provide technical assistance** to districts, states, and the federal government on implementing priority actions.
- **Research** the complexities of our public school places and how to achieve greater effectiveness, efficiency, and equity in public school facilities delivery.
- **Advocate for appropriate federal and state roles** for ensuring all children have access to adequate public school buildings and grounds.
- **Support constituency building and communications of civic sector groups** advocating for adequacy and equity in public school buildings and grounds.

The 21st Century School Fund, Center for Cities + Schools, National Council on School Facilities, and Center for Green Schools are committed to providing national leadership for Phase 2. We will continue our work on the technical and political challenges and opportunities that this roadmap provides. We will work to expand the community of experts and community leaders dedicated to creating and supporting systems of responsible public facilities stewardship.

This is ambitious work. However, we have seen from our experience and research, that our public school places are essential cornerstones for public education and community strength.

APPENDIX A

Process and Engagement Methods

The 21st Century School Fund (21CSF) and the University of California-Berkeley's Center for Cities + Schools (CC+S), in partnership with the National Council on School Facilities (NCSF) and the Center for Green Schools (CGS) at the U.S. Green Building Council, launched the national *Planning for PK-12 Infrastructure: Adequate Public School Facilities for All Children* initiative in 2016 to counter the forces of inadequacy and inequality in public school facilities across the country.

Phase 1 builds on the deep experience our organizations have in improving public school facilities and our recent research findings on the state of the field. In 2016, 21CSF, NCSF, and CGS released *State of Our Schools: America's K-12 Facilities*, a national report that quantified the widespread structural funding deficit in our public school infrastructure.³² The study looked at 20 years of PK-12 public school facilities spending by states, comparing past levels of spending to minimum investment standards to meet modern standards for adequate and equitable public school facilities. In 2015, CC+S released *Going it Alone: Can California's K-12 School Districts Adequately and Equitably Fund School Facilities?*, a study using a similar approach that looks deeper at school facility spending in California.³³ Again, we found a dramatic trend of statewide underinvestment in school facilities. We also found significant facility investment inequities from school district to school district across the state. What these two studies document is the ongoing structural pattern of both inequitable investment and underinvestment in our PK-12 infrastructure that harms student health and achievement—and is sadly familiar to many students, teachers, and communities.

Building off these research findings and our collective decades-long work to improve public school facilities, our four organizations came together to develop a comprehensive plan for strategic, pro-active solutions. Our leadership team is focused on understanding the challenges to adequate and equitable school facilities and identifying solutions to remedy these deficiencies. The organizing framework for our analytic approach was the six essential elements of PK-12 facilities stewardship systems, as identified by previous research: *Governance and Decision Making; Funding; Maintenance, Operations and Capital Management; Data and Information Management; Educational Facilities Planning; and Accountability*.³⁴



Led by a research and facilitation team from 21CSF and CC+S, our Phase 1 research and engagement process utilized a mixed-method strategy involving six national expert working groups and three days of structured in-person discussion and feedback among working groups and state officials, as described below. Utilizing Delphi method techniques, we garnered input from 85 leaders from 33 states and the District of Columbia who represented a diverse group of non-profit advocacy leaders, local and state officials, researchers, industry professionals, labor advocates, and finance experts.

Six National Working Groups of Cross-Sector Experts

Using elements of the “Delphi” method, a facilitated group technique was used to structure the collection and distillation of knowledge through multiple rounds of feedback and engagement with participants. A diverse group of national experts with a wide range of experiences and knowledge in the field participated in the process. A Delphi approach is especially useful when there is limited or incomplete knowledge of an issue and policy or practice solutions to challenges are being sought, as is the case in the PK-12 facility infrastructure field.³⁵

During the Fall of 2016, 60 non-profit advocacy leaders, local and state officials, researchers, industry professionals, labor advocates, and finance experts were recruited nationally to form working groups organized around the six essential elements of PK-12 facilities stewardship systems noted above. Recruitment for the working groups drew upon the extensive national networks of the Leadership Team. Working group members were also asked to submit nominations for potential additional working group members. Each working group included civic sector education, health, environment and equity advocates; local and state public officials; private building-industry professionals (including architects, construction managers, engineers and facilities data system managers); public and private finance and legal experts; labor representatives; and academic researchers. (See Working Group participant list in Appendix B.)



Civic



Governmental



Building Industry



Public Finance



Labor



University

Working group members participated in a highly-structured four-month process of four rounds of feedback, facilitated by staff from 21CSF and CC+S. The feedback from participants was structured into four tasks: a) articulating the *problems* in school facilities specific to the working group topic (e.g., funding, planning, accountability, etc.); b) identifying the negative *impacts* of these problems; c) describing the underlying causes of the problems; and d) generating solutions to the problems that address the causes. Participants were encouraged to be creative in generating “solution ideas,” which could be policy reforms, practice innovations, information technology tools, investment strategies, etc. Throughout the process, the research and facilitation team conducted detailed content analysis of the feedback received, then consolidated, synthesized, and refined the findings for the next round of review from participants.

Structured event #1: For each working group, a 30 minute conference call webinar was conducted (three hours total). On these, the research facilitators described the objectives and gave a process overview.

- Problem statements draft #1: 21CSF and CC+S prepared a short list of statements on the problems, impacts, and causes for each of the elements of the PK-12 infrastructure system and emailed this information in a Microsoft Word document to working group participants to review, edit, and expand upon based on their experience and expert opinions. Participants emailed their feedback on the problem statements in track changes to 21CSF and CC+S.

Structured event #2: 21CSF and CC+S facilitated a 1 hour conference call webinar for each of the six working groups to present and discuss the feedback on the problem statements (six hours total). Each participant was given 3-5 minutes to verbally summarize his/her thoughts and suggested edits, with group discussion following. Each webinar was recorded and transcribed.

- Problem statements draft #2: Written and verbal feedback was then consolidated and analyzed by 21CSF and CC+S for each working group and 21CSF and CC+S revised the problem statements, impact statements, and causes statements.
- The facilitators then emailed the revised document back to the members in the corresponding working group for review and edit.
- Solution ideas draft #1: Working group participants were additionally instructed to generate a list of “solution ideas” to address the problems identified in the first round and to provide examples of where these ideas may already be implemented.

Structured event #3: 21CSF and CC+S facilitated a third conference call webinar for each working group, lasting 1.5 hours (nine hours total). On this call, the facilitators presented and reviewed the revisions and participants were each given 5 minutes to summarize his/her thoughts and suggested edits on draft #2 of the problem statement and on their proposed solution ideas. These webinars were recorded and transcribed.

- Solutions framework and solutions draft #1: 21CSF and CC+S used the written and verbal feedback of participants to analyze, consolidate, and revise them into a framework for solutions and the first list of solution ideas. The facilitators then emailed the revised document back to the members in the corresponding working group for review and edit. They were instructed to review all revisions but to focus their feedback on editing and expanding the list of “solution ideas” and providing real-world examples of the solutions ideas. Participants emailed their feedback in track changes to the facilitators.

Structured event #4: 21CSF and CC+S facilitated a fourth conference call webinar for each working group, lasting 2 hours (twelve hours total). On this call, the facilitators presented the solutions framework and list of solution ideas, reviewed the revisions and each participant was given 5–7 minutes to summarize his/her thoughts, make suggested edits, and explain and elaborate on solution ideas. The webinars were recorded and transcribed.

- Solutions framework and ideas draft #2: 21CSF and CC+S conducted an in-depth analysis of the feedback from all participants in each working group. A database of solution ideas and examples and comments was created. In total, 400 solution ideas were generated across the working groups. Duplicative or repetitive solution ideas were consolidated and revised.
- Solution framework and ideas draft #3: 21CSF and CC+S prepared a draft documentation of the findings from each working group that included the problem statement, list of impacts, list of causes, and a list of solutions ideas with examples.
- Draft Summary Report: *Mapping Equity into PK-12 Infrastructure: Quality School Facilities for All Children, Draft Report*. 21CSF and CC+S consolidated and synthesized the problem analysis, solutions framework, and list of proposed actions from each working group into a DRAFT Summary Report. The report also contained an overview of the process, rationale, and a consolidation and synthesis of the 400 solution ideas by 21CSF and CC+S down to 200 proposed actions. (Report available at <http://citiesandschools.berkeley.edu/school-facilities>.)
- The facilitators then emailed a PDF of the summary report to all working group participants, prior to the in-person meetings in December, 2016.

25 State Facility Officials Provide Input

The 200 proposals generated by the working groups were reviewed by state school facility officials at the Annual Meeting of the National Council on School Facilities (NCSF), December 5-6th, 2016 in Washington, D.C. Facilitated by the National Council on School Facilities, the 21st Century School Fund, and the Center for Cities + Schools, state facilities officials from 25 states spent two days discussing, assessing, and scoring the findings and proposals generated by the working groups.³⁶ State officials were given copies of the report, *Mapping Equity into PK-12 Infrastructure: Quality School Facilities for All Children, Draft Report* and worksheets listing all 200 solution ideas generated through the working group process. NCSF participants individually scored each state, federal, and national proposed action along four criteria: potential to positively affect the *condition* of school facilities; potential to positively affect the *equity of access* to adequate public school facilities; potential to positively affect the *affordability* of delivering adequate public school facilities; and the perceived *difficulty* to implement. The results were compiled, tabulated, and analyzed by the research team. (See state facility official participant list in Appendix B.)

Experts Convene: Mapping Equity into PK-12 Infrastructure National Summit

On December 7th, 2016, the 60 working group members and 9 state facility officials from the NCSF convened at the Thurgood Marshall Center in Washington, D.C. for the **Mapping Equity into PK-12 Infrastructure National Summit**.

At the summit, 21CSF and CC+S facilitated another structured process for expert feedback and input. National Summit participants were divided into eight cross-sector groups. These groups mixed up members from working groups. Groups were given copies of the report, *Mapping Equity into PK-12 Infrastructure: Quality School Facilities for All Children, Draft Report* and worksheets listing all 200 solution ideas generated through the working group process. Each summit group had a facilitator, and was asked to arrive at group consensus on 5–7 priority proposed actions that they believed would have the greatest potential to remedy inadequacy and inequity in the PK-12 infrastructure sector and are most able to be replicated, developed, and scaled. Each group had a 1 hour discussion, to review local proposed actions, state proposed actions and federal and national proposed actions. For each level of community — local, state and federal — each group identified priority solutions, and then presented their consensus findings to the larger group. The research team audio recorded the group presentations for transcription.

Following the December meetings, the research team conducted a detailed content analysis of all material generated from the process — working group findings, NCSF participant scoring, and the summit group priority recommendations. Triangulating these data, the 21CSF and CC+S synthesized and refined the problem analyses, solution ideas, and priority actions generated through the process for this report. A draft of this report was emailed to participants for comments and comments were incorporated into this report.

APPENDIX B

Working Group and State Official Participants

Governance & Decision Making Working Group

- Pam Attardo, Historic Preservation Officer, Lewis & Clark County (Montana)
- Violet W. Brown, Senior Educational Program Director, Office of Educational Facilities, Florida Department of Education
- Lee Dulgeroff, Chief Facilities Planning and Construction Officer, San Diego Unified School District
- Kate Gordon, Chair, Citizen's Oversight Board, California Proposition 39
- David Lever, former Executive Director, Maryland Public School Construction Program
- Scott Newell, Senior Director, Cooperative Strategies/ Dolinka Group (Colorado)
- Bernard E. Piaia, Jr., Director, Office of School Facilities, New Jersey Department of Education
- Cynthia Uline, Professor Emeritus, Educational Leadership, San Diego State University

Funding Working Group

- Nancy Brune, Director, Kenny Guinn Center for Policy Priorities (Nevada)
- Rick Gross, CEO, BW Realty Advisors
- Vincent Hughes, Senator, State of Pennsylvania
- Rocky Query, CEO, Query Associates
- Lori Raineri, President, Government Financial Strategies Inc.
- Marialena Rivera, Assistant Professor, Texas State University
- Mike Rowland, Facilities Services Director, Georgia Department of Education
- David Sciarra, Executive Director, New Jersey Education Law Center
- William Volker, President, Efficiency Energy, LLC

Management Working Group

- John Dale, Chair, Committee on Architecture for Education, AIA; Principal and Pre K-12 Studio Leader, HED
- Bob Gorrell, Director, New Mexico Public School Facilities Authority
- Martin Knott, President, Knott Mechanical and Wye River Technologies
- Frank Patinella, Senior Education Advocate, American Civil Liberties Union (Maryland)
- Tom Rogér, Vice President, Finger Lakes & Central NY, Gilbane Building Company
- Jerry Roseman, Director of Environmental Science & Occupational Safety & Health for the Philadelphia Federation of Teachers Health & Welfare Fund & Union
- Bill Savidge, Former Engineering Officer, West Contra Costa Unified School District & Former Chief Executive Office, California State Allocation Board
- Don Ulrich, Assistant Superintendent, Facilities Services, Clovis Unified School District (California)
- Jim Wilson, CEO/President, JFW Inc, Project Management

Planning Working Group

- Darryl Alexander, Director of Health, Safety and Well-being, American Federation of Teachers
- Ariel Bierbaum, Assistant Professor, Urban Studies and Planning Program, School of Architecture, Planning and Preservation, University of Maryland
- Steven Bingler, CEO, Concordia, LLC
- Shirl Buss, Y-PLAN Creative Director, Center for Cities + Schools, UC Berkeley
- Sharon Danks, CEO, Green Schoolyards America
- Bill DeJong, Co-founder at Schools for the Children of the World, Senior Advisor DeJong-Richter
- Melanie Drerup, Director of Planning, Ohio Facilities Commission
- David Knotts, Executive Director of Capital Programs, Fulton County Schools (Georgia)
- Jacqueline Leavy, Advisor to the Chicago Educational Facilities Master Planning Task Force
- Jeanne Schultz, Executive Director, Hawaii Institute of Public Affairs

- Peggy Shepard, Executive Director, West Harlem Environmental Action
- Perry Taylor, Director of Facilities, Alabama Department of Education

- Krisztina Tokes, Director of Planning, Los Angeles Unified School District

Data & Information Working Group

- Jason Bocarro, Associate Professor, North Carolina State University, College of Natural Resources
- Lettie Boggs, Chief Executive Officer, Colbi Technologies
- Scott Brown, Director of Facilities, Maine Department of Education
- W.T. “Dusty” Duncan, Facilities Director, Marion School District (Arkansas)

- Lee Prevost, Strategic VP, SchoolDude.com
- Dan Rademacher, Executive Director, GreenInfo Network
- Jerry Roseman, Director of Environmental Science & Occupational Safety & Health for the Philadelphia Federation of Teachers Health & Welfare Fund & Union
- Jim Whittaker, President, Facilities Engineering Associates, Inc.

Accountability Working Group

- Brooks Allen, Vice President, Policy & Legal Affairs, Common Sense (California)
- Claire Barnett, Director, Healthy Schools Network
- Phoebe Beierle, Center for Green Schools at USGBC
- Sarah Hains, Research Facilitator, Chicago Teachers Union

- Juan Mireles, Director, School Facilities and Transportation Services Division, California Department of Education
- Kathy Patterson, Auditor, District of Columbia
- Mike Pickens, Director of Facilities, West Virginia Department of Education
- David Walrath, President/Legislative Advocate, Murdoch, Walrath, & Holmes (California)

State Officials Providing Input on Priorities at the NCSF Annual Meeting 2016

- Tim Mearig, Facilities Manager, Alaska Dept. of Education & Early Development
- Perry Taylor, State Architect and Director of Facilities, Alabama State Dept. of Education*
- Brad Montgomery, Director, Public School Academic Facilities & Transportation, Arkansas Dept. of Education
- Paul Bakalis, Executive Director, Arizona School Facilities Board
- Juan Mireles, Director, School Facilities and Transportation Services Division, California Dept. of Education*
- Jim Owens, Director, Div. of Public School Capital Construction, Colorado Dept. of Education
- Konstantinos Diamantis, Director, Office of School Construction Grants & Review, Connecticut Dept. of Administrative Services
- James Pennewell, Capital Projects, Delaware Dept. of Education
- Violet Brown, Senior Education Program Director, Florida Dept. of Education*
- Mike Rowland, Director of Facilities Services, Georgia Dept. of Education*
- Gary Schwartz, School Facilities Consultant, Iowa Dept. of Education
- Barbara Bice, School Facilities Branch Chief, Maryland State Dept. of Education

- Scott Brown, Director of School Facility Programs, Maine Dept. of Education*
- Ken Phelps, Lead School Planning Consultant, North Carolina Dept. of Public Instruction
- Amy Clark, Administrator of School Safety & Facility Management, New Hampshire Dept. of Education
- Bernard Piaia, Director of Facilities, New Jersey Dept. of Education
- Robert Gorrell, Director, New Mexico Public School Facilities Authority*
- Rosanne Groff, Interim Director of Facilities, New York State Education Dept.
- Melanie Drerup, K-12 Planning Manager, Ohio Facilities Construction Commission*
- Michael Elliott, State School Fund Coordinator, Oregon Dept. of Education
- Joseph da Silva, School Construction Coordinator, Rhode Island Dept. of Education
- Jenefer Youngfield, School Construction Inspection Specialist, Utah Dept. of Education
- Michael Pickens, Executive Director, West Virginia Dept. of Education*
- Delbert McOmie, Director, Wyoming State Construction Dept.

**Also working group members.*

ENDNOTES

1. Vincent, J.M. 2014. Joint Use of Public Schools: A Framework for Promoting Healthy Communities. *Journal of Planning Education and Research* 34(2): 153-168.
2. Allen, J.G. et al. 2017. Foundations for Student Success: How School Buildings Influence Student Health, Thinking and Performance. Cambridge, MA: Harvard T.H. Chan School of Public Health, Harvard Center for Health and the Global Environment. <http://schools.forhealth.org>
3. Fisk, W.J. et al. 2016. Significance of the School Physical Environment—A Commentary. *Journal of School Health* 86(7): 483-487.
4. U.S. Environmental Protection Agency. 2011. Report of the Indoor Environment Workgroup on Indoor Environment. Children's Health Protection Advisory Committee. Washington, DC: US EPA. https://www.epa.gov/sites/production/files/2014-05/documents/chpac_indoor_air_report.pdf.
5. Uline, C. and Tschannen-Moran, M. 2008. The Walls Speak: The Interplay of Quality Facilities, School Climate, and Student Achievement. *Journal of Educational Administration* 46(1): 55-73.
6. Maxwell, L.E. 2016. School building condition, social climate, student attendance and academic achievement: A mediation model. *Journal of Environmental Psychology* 46: 206-216.
7. Branham, D. 2004. The wise man builds his house upon the rock: The effects of inadequate school building infrastructure on student attendance. *Social Science Quarterly* 85(5): 1112-1128.
8. Buckley, J. et al. 2005. Fix it & they might stay: School facility quality and teacher retention in Washington, D.C. *Teachers College Press* 107: 1107-1123.
9. United States Department of Education, Office For Civil Rights 2014. "Dear Colleague Letter: Resource Comparability." Washington, DC: US ED. <https://www2.ed.gov/about/offices/list/ocr/letters/colleague-resourcecomp-201410.pdf>.
10. Neilson, C. A., and Zimmerman, S. D. 2014. The effect of school construction on test scores, school enrollment, and home prices. *Journal of Public Economics* 120: 18-31.
11. Filardo, M. 2016. State of Our Schools: America's PK-12 Facilities 2016. Washington, D.C.: 21st Century School Fund, National Council on School Facilities and Center for Green Schools. <http://centerforgreenschools.org/state-our-schools>.
12. Bivens, J. and H. Blair. 2016. A Public Investment Agenda. Washington, DC: Economic Policy Institute. <http://www.epi.org/files/pdf/117041.pdf>.
13. Filardo, M. 2016. State of Our Schools: America's PK-12 Facilities 2016. Washington, D.C.: 21st Century School Fund, National Council on School Facilities and Center for Green Schools. <http://centerforgreenschools.org/state-our-schools>.
14. Filardo, M. 2008. Good Buildings, Better Schools: An Economic Stimulus Opportunity with Long-Term Benefits, Briefing Paper #216. Washington, DC: Economic Policy Institute. <http://www.gpn.org/bp216/bp216.pdf>.
15. U.S. Environmental Protection Agency. 2014. Energy Savings Plus Health: Indoor Air Quality Guidelines for School Building Upgrades. Washington, DC: U.S. EPA. https://www.epa.gov/sites/production/files/2014-10/documents/energy_savings_plus_health_guideline.pdf.
16. The U.S Department of Education reports that more than half of U.S. schools have inadequate structural facilities, which may directly affect children's health, including poor lighting, acoustics, temperature regulation, or air quality (Alexander, D., and Lewis, L. 2014. Condition of America's Public School Facilities: 2012-13 (NCES 2014-022). U.S. Department of Education. Washington, DC: National Center for Education Statistics); The American Society of Civil Engineers gives our public K-12 infrastructure a grade of "D+" in their 2017 Infrastructure Report Card (<http://www.infrastructurereportcard.org/cat-item/schools/>).
17. Council of Great City Schools. 2014. Reversing the Cycle of Deterioration in the Nation's Public School Buildings. Washington, DC: Council of Great City Schools. <https://www.cgcs.org/cms/lib/DC00001581/Centricity/Domain/87/FacilitiesReport2014.pdf>.
18. Alexander, D. and Lewis, L. 2014. Condition of America's Public School Facilities: 2012-13 (NCES 2014-022). U.S. Department of Education. Washington, DC: National Center for Education Statistics; Filardo, M. et al. 2006. Growth and Disparity: A Decade of U.S. Public School Construction. Washington, DC: Building Educational Success Together. http://citiesandschools.berkeley.edu/reports/BEST_2006_GrowthandDisparity_final.pdf.
19. Sciarra, D.G., Bell, K.L., and Kenyon, S. 2006. Safe and Adequate: Using Litigation to Address Inadequate K-12 School Facilities. Newark: New Jersey Education Law Center. http://www.edlawcenter.org/assets/files/pdfs/publications/Safe_and_Adequate.pdf.
20. United States Department of Education, Office For Civil Rights. 2014. "Dear Colleague Letter: Resource Comparability." Washington, DC: US ED. <https://www2.ed.gov/about/offices/list/ocr/letters/colleague-resourcecomp-201410.pdf>.
21. 21st Century School Fund, Scientex Corporation, and the World Bank. 1999. Public School Capital Improvement Programs: Basic Elements and Best Practices. Washington, DC: 21csf. <http://www.21csf.org/csf-home/publications/publicschools/PublicSchoolCapitalImprovementPrograms.pdf>.
22. See: <http://centerforgreenschools.org/state-our-schools>.
23. Vincent, J.M., and Jain, L.S. 2015. Going it Alone: Can California's K-12 School Districts Adequately and Equitably Fund School Facilities? Policy Research Working Paper. Berkeley: Center for Cities + Schools, University of California. http://citiesandschools.berkeley.edu/uploads/Vincent_Jain_2015_Going_it_Alone_final.pdf.
24. Vincent, J.M., and Jain, L.S. 2015. Going it Alone: Can California's K-12 School Districts Adequately and Equitably Fund School Facilities? Policy Research Working Paper. Berkeley: Center for Cities + Schools, University of California. http://citiesandschools.berkeley.edu/uploads/Vincent_Jain_2015_Going_it_Alone_final.pdf.
25. Filardo, M. 2016. State of Our Schools: America's PK-12 Facilities 2016. Washington, D.C.: 21st Century School Fund, National Council on School Facilities and Center for Green Schools. <http://centerforgreenschools.org/state-our-schools>.
26. Sciarra, D.G., Bell, K.L., and Kenyon, S. 2006. Safe and Adequate: Using Litigation to Address Inadequate K-12 School Facilities. Newark: New Jersey Education Law Center. http://www.edlawcenter.org/assets/files/pdfs/publications/Safe_and_Adequate.pdf.
27. Vincent, J.M. 2016. Building Accountability: A Review of State Standards and Requirements for K-12 Public School Facility Planning and Design. Berkeley: Center for Cities + Schools, University of California. http://citiesandschools.berkeley.edu/uploads/Vincent_2016_K12_facility_state_standards.pdf.
28. Rivera, M. 2017. What about the Schools? Factors Contributing to Expanded State Investment in School Facilities. San Antonio, TX: Intercultural Development Research Association. <http://www.idra.org/wp-content/uploads/2017/04/IDRA-School-Facilities-Report-by-Dr-Marialena-Rivera-2017.pdf>.

29. Vincent, J.M. 2012. California's K-12 Educational Infrastructure Investments: Leveraging the State's Role for Quality School Facilities in Sustainable Communities. Center for Cities + Schools, University of California. <http://citiesandschools.berkeley.edu/reports/CCS2012CAK12facilities.pdf>.
30. Filardo, M. 2016. State of Our Schools: America's PK-12 Facilities 2016. Washington, D.C.: 21st Century School Fund, National Council on School Facilities and Center for Green Schools. <http://centerforgreenschools.org/state-our-schools>.
31. Paulson, J.A. and Barnett, C.L. 2016. Public Health Stops at the School House Door. *Environmental Health Perspectives* 124(10): A171-A175.
32. Filardo, M. 2016. State of Our Schools: America's PK-12 Facilities 2016. Washington, D.C.: 21st Century School Fund, National Council on School Facilities and Center for Green Schools. <http://centerforgreenschools.org/state-our-schools>.
33. Vincent, J.M., and Jain, L.S. 2015. Going it Alone: Can California's K-12 School Districts Adequately and Equitably Fund School Facilities? Policy Research Working Paper. Berkeley: Center for Cities + Schools, University of California. http://citiesandschools.berkeley.edu/uploads/Vincent__Jain_2015_Going_it_Alone_final.pdf.
34. 21st Century School Fund, Scientex Corporation, and the World Bank. 1999. Basic Elements of a Well-Managed K-12 Capital Improvement Program. Washington, DC: 21csf; U.S. General Accounting Office. 1998. Leading Practices in Capital Decision-Making (GAO/AIMD-99-32). Washington, DC: US GAO.
35. Okoli, C. and Pawlowski, S.D. 2004. The Delphi method as a research tool: an example, design considerations and applications. *Information & Management* 42:15-29.
36. Summary of the 2016 NCSF Annual Meeting: <http://www.facilitiescouncil.org/ncsf%2Dhome/Events.asp>.