



Taking Schoolyard Forests to Scale

Research Summary and Recommendations

Green Schoolyards America conducted interviews with California school districts, public agencies, and tree planting organizations to better understand what is needed to take schoolyard forests to scale across the state efficiently, effectively, and equitably. This article summarizes our findings and reports on existing challenges that impede implementation as well as opportunities that could be harnessed to improve green schoolyard and schoolyard forest policy and practice at local and state levels in the future.

Introduction

Across California, more than 10,000 public schools serve 5.9 million PreK-12 students on more than 129,000 acres of public land, every day. Much of that land is paved and lacks trees or shade. As temperatures continue to rise due to climate change, this situation is becoming a crisis. The lack of trees and natural areas in schools is an environmental justice problem that disproportionately impacts communities of color and communities with the lowest incomes. When nature is absent where children spend their time, they are denied the mental, physical, social-emotional, and learning benefits afforded to children in greener and often wealthier areas.

To address this problem, Green Schoolyards America, the California Department of Forestry and Fire Protection (CAL FIRE), the California Department of Education (CDE), and Ten Strands have launched the California Schoolyard Forest SystemSM. This statewide initiative seeks to increase tree canopy on public school grounds across California to shade and protect PreK-12 students from extreme heat and rising temperatures due to climate change.



Many California school grounds are barren expanses of asphalt.

Our first phase of work on this multi-decade initiative is establishing a framework for scaling schoolyard forests across California. We are also working to support the unprecedented investments—\$150 million over two years—that the state government is making in schoolyard greening and nature-based climate solutions.

In 2022–23, Green Schoolyards America’s activities to establish the framework for the California Schoolyard Forest System include:

- conducting an analysis of existing policies and practices that govern tree planting at PreK-12 public schools to identify challenges and opportunities for bringing schoolyard forests to scale;
- creating a “Schoolyard Tree Canopy Equity” geographic information system (GIS) that includes data for every PreK-12 public school in California, to establish a baseline for existing conditions, track progress, and inform future policy priorities;
- building public awareness and inspiring school districts to create their own visions and action plans to implement schoolyard forests;
- providing technical assistance and online resources to support successful schoolyard forest planning, implementation, stewardship, and instruction; and
- implementing pilot projects to field-test schoolyard forest models and approaches.

This article summarizes the findings of our initial assessment of the challenges and opportunities that school districts and tree planting organizations face when trying to establish schoolyard forests in California. It also includes our recommendations about the ways in which state policies and practices from different public agencies could be aligned to improve green schoolyard and schoolyard forest implementation in the future.

Our intention is to provide potential solutions for policy makers and school district leaders to explore as they work to address tree canopy equity across the state. By identifying challenges and opportunities and creating alignment at different levels of scale, we hope to lay the groundwork necessary to develop specific policy recommendations that will accelerate and optimize California’s schoolyard forests and tree canopy equity in the years to come.

Methods

The findings presented in this article are based on the following:

- interviews and feedback collected in the second half of 2022 from 10 school districts, five county offices of education, and 16 organizations that plant trees and design green schoolyards in California;
- feedback gathered through interviews with state agencies, in public meetings, and through site visits in 2022;
- comments received through our website from over 230 survey respondents; and
- the professional expertise of Green Schoolyards America’s team, which includes staff members and consultants who have been working in the green schoolyard field for decades.



Site visit to Eagle Rock Elementary in Los Angeles, California, attended by Green Schoolyards America, CAL FIRE, CDE, and Dr. Marcella Raney.

Findings

Challenges and Opportunities

Listening to stakeholders was our first step toward creating the alignment and common understanding needed to increase schoolyard tree canopy equity across the state.

After conducting interviews with staff members from California school districts, county offices of education, tree-planting organizations, landscape design firms, and state agencies, we analyzed our findings and identified six areas where schoolyard greening and tree-planting efforts are encountering significant challenges that reduce the overall number of projects and lead to inefficient and inequitable schoolyard greening across the state. Most of these challenges stem from old systems designed for outdated educational goals, aging school infrastructure, and siloed planning approaches at all levels of scale.

Our interviews and evaluation process also revealed growing enthusiasm for schoolyard forests and green schoolyards and increasing readiness to find solutions to those challenges and to forge a path forward to increase tree canopy in schoolyards to benefit children.

Overall, we found that demand is rising. School districts are increasingly interested in transforming their grounds from asphalt to ecosystems. Their questions for our organization have changed from “why” they should create green schoolyards and increase tree canopy, to “how” to implement the changes they would like to see on their grounds. This paradigm shift is vitally important since school districts are land managers and also determine students’ access to the outdoors at school.

We have organized the challenges and opportunities by topic, starting from more local and immediate obstacles, followed by broader systemic issues at local and state levels. We have grouped the challenges and opportunities into the following categories: site planning considerations, school district maintenance, safety and liability, institutional systems, funding, and state policy. These challenges and opportunities are intertwined and therefore should not be considered in isolation.

TYPES OF CHALLENGES AND OPPORTUNITIES FOR CREATING SCHOOLYARD FORESTS



**SITE PLANNING
CONSIDERATIONS**



**SCHOOL DISTRICT
MAINTENANCE**



**SAFETY AND
LIABILITY**



**INSTITUTIONAL
SYSTEMS**



FUNDING



STATE POLICY

Site Planning Considerations

Many public school facilities were built in the postwar era and are aging. According to University of California Berkeley's Center for Cities and Schools, California's public schools are old and poorly maintained; in fact, approximately 40% of California schools are over 50 years old. This creates many barriers but also presents opportunities to re-envision schoolyards to address current environmental and educational needs.

CHALLENGES

Extensive pavement. There are significant costs and logistics associated with asphalt removal and disposal when creating schoolyard forests. When a portion of asphalt is removed, there are also costs associated with stabilizing the edges of that pavement after it is cut.

Poor soil. The soil beneath pavement is usually compacted and has poor drainage, making it very difficult for trees to survive unless significant efforts are undertaken to improve the soil.

Contamination. Lead and other contaminants may be present under the asphalt. The lack of information and fear of "opening a can of worms" are barriers to embarking on projects that require asphalt removal, not only due to the costs of environmental testing, but also due to the potential high costs of removal and disposal of contaminated soil.

Water access. Tree survival may be reduced if trees are planted far from water sources, so new tree plantings often require changes to school ground irrigation systems, which may include trenching. If irrigation is not installed, relying on hand-watering may put recently planted trees in peril, especially during the summer when school is not in session.

Deferred maintenance and code compliance.

Many facilities have deferred maintenance and code compliance problems, especially related to accessibility. Small projects can trigger major upgrades that school districts are not able to fund.

Space constraints. There are often competing priorities for outdoor space, including sports fields, ball courts, assembly space, line-up space, vegetable gardens, outdoor classrooms, and parking. Requirements for emergency access and compliance with the Americans with Disabilities Act (ADA) determine the paths of travel and take up additional open space in school grounds.

Presence of utilities. Underground and overhead utilities limit where trees can be planted. These constraints are exacerbated by the fact that many sites do not have accurate records of underground utilities. If such records are missing, districts often need to hire contractors to assess and survey existing conditions.

Funding and staff capacity. Many school districts do not have the in-house capacity, expertise, or funding needed to perform required site assessments and lead a participatory planning and design process to develop master plans for their schoolyards.



Extensive asphalt and rubber surfaces are typical in California schoolyards. These materials heat up in the sun and expose children to high temperatures.

SITE PLANNING OPPORTUNITIES

Embrace collective impact. Successful schoolyard forest projects begin with a collaborative design process that includes school and district decision-makers, students, teachers, tree-planting organizations, and other stakeholders who work together to agree on the project's vision, scale, and location.

Select the right location for the forest. It is important to conduct a thorough site analysis and include stakeholders' perspectives before finalizing the schoolyard forest's location. Consider places that are accessible to students during the school day, are convenient for teachers, and have access to water for irrigation. Locating a schoolyard forest near school buildings can also provide shade to cool adjacent classrooms. Avoid areas that conflict with utilities, emergency access, and plans for future building construction.

Create a schoolyard master plan. Schoolyard master plans are useful communication and consensus-building tools. They are easily understood by stakeholders and are also vital additions to grant proposals. Master plans are particularly helpful for large-scale tree-planting efforts, projects that will be phased in over time, and designs that need further discussion before approval is granted.

Engage government agencies. As school districts increase their focus on schoolyard greening and forests, there will be an increasing need for state agencies to participate in this paradigm shift. For example, contaminated soils and other environmental justice issues could be better addressed by supporting school districts' efforts with resources and expertise from existing programs run by the Environmental Protection Agency, the Strategic Growth Council, and the California Department of Public Health.

Include student participation. Inviting students to participate in the design process, tree planting, and ongoing stewardship for their own school grounds gives them a chance to apply standards-based, hands-on learning in a way that is personally relevant and makes a visible difference. Engaging students as change-makers demonstrates that their actions matter and builds competence, confidence, and hope for the future.

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Oftentimes we find that kids are missing from the conversation.

Ashley Hart
LOS ANGELES NEIGHBORHOOD LAND TRUST



Paige Green

School District Maintenance

Most school districts are not yet set up to provide the necessary “park-level management” for their school grounds and struggle with reduced schoolyard maintenance budgets and staff capacity, making it very difficult to continue operating in the same way they were operating in the past. This presents an opportunity to overhaul systems to better support outdoor learning and sustainability.

CHALLENGES

Staff capacity and expertise. Most school districts' operations and maintenance departments lack the number of adequately trained groundskeepers needed to maintain schoolyard forests and gardens. Groundskeepers are usually trained to maintain sports facilities and lawns rather than gardens and trees, and union labor rules limit the tasks they can perform. For this reason, tree planting and maintenance efforts often rely on nonprofit partners and school champions (families, teachers, or other staff) that work on these projects as an added effort on top of their ongoing responsibilities. Both volunteers and groundskeepers have limitations on what they are able to do; therefore, some tasks, such as trimming for large trees, must be contracted out to external providers.

School seasonality. Tree planting and establishment usually rely on champions who are present only during the school year. This is a problem in the summer while school is in recess. In addition, given that family and staff turnover is likely, trees may not get the required consistent care needed for survival, especially during establishment.

Unclear responsibilities. Establishing a clear line of responsibility for tree care is sometimes challenging, and this results in trees being neglected. Responsibilities are usually shared among multiple people, and this may change over time, not only due to staff turnover but also due to changing needs for tree maintenance as trees grow. For instance, major irrigation, plumbing, and drainage repairs may be handled by district facilities staff, while pruning and tree care may be handled by school site groundskeepers, family volunteers, contractors, or nonprofit partners. Lack of communication between them may result in irrigation being cut off or trees being neglected.

Maintenance expectations and perceptions. There is a perception that all tree debris should be removed from the school site for beautification and in some cases for safety purposes. This perception leads to increased labor and time devoted to sweeping and leaf blowing. Schools and districts have expressed concerns that students will track mud and tree debris into indoor spaces, particularly after rainfall, which will contribute to additional work for janitorial staff.

Lack of cost–benefit information. There is a perception that trees consume too much water and cost too much to maintain. Not many studies exist that quantify the benefits of trees for school districts, in particular those that directly lead to cost savings such as reduced air conditioning needs, reduced absenteeism, and increased enrollment.



Maintenance funding for trees fluctuates and competes with other needs.

Wanda Stewart
COMMON VISION



Groundskeepers are vital to the success of schoolyard forests.

SCHOOL DISTRICT MAINTENANCE OPPORTUNITIES

Focus maintenance resources on children. Rather than spending resources maintaining water-intensive lawns, trees, and shrubs in front of the school for “curb appeal,” districts should consider shifting water use and maintenance budgets to focus on locations accessible to children where trees can provide health, educational, and climate resilience benefits.

Design for low maintenance. Replacing water-intensive lawns and shrubs planted for “curb appeal” with climate-appropriate and low-maintenance plant species, and installing water-efficient irrigation systems will help reduce maintenance costs over the long term.

Develop management plans. For a schoolyard forest to be sustainable and healthy over time, schools and school districts will need support to develop management plans that outline tree care tasks and responsibilities at different stages in the planting and growth of a schoolyard forest. For instance, the work needed during planting and establishment is different from the work needed to maintain mature trees.

Engage students in stewardship. Engaging students in the stewardship of their schoolyard forests is a great way to foster a sense of ownership and build life-long skills. This is best accomplished by embedding stewardship activities into the curriculum and regular school activities.

Build schoolyard forests into existing job descriptions. Districts can consider building certain tasks that support a schoolyard forest into existing positions, not only within the facilities and maintenance department, but also within other departments such as instruction, sustainability, nutrition services, and health.

Explore new funding and partnerships. The multi-benefit nature of schoolyard forests provides opportunities to explore new and non-traditional funding mechanisms and partnerships that can support long-term maintenance. For example, if schools are open after hours and can function also as local parks, joint-use partnerships with city park departments could provide maintenance resources.



Students participate in schoolyard stewardship.

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We need to consider school district budgets and maintenance resources.

Wanda Stewart
COMMON VISION

Safety and Liability

Many of the concerns listed in this section are real risks that stem from selecting the wrong trees, placing them or planting them incorrectly, and not maintaining them appropriately. Other concerns may be due to lack of data and information and the fact that school districts' facilities departments are better set up to upgrade and maintain buildings and structures than to plant and maintain trees. Synthetic products have warranties, are more predictable, and have different maintenance needs. Trees are living organisms that require a unique approach.

CHALLENGES

Branches and trees falling. Brittle and poorly maintained trees have an increased risk of failure and consequently present a risk to students and staff.

Tripping and other hazards caused by roots. Some districts have concerns that tree roots will break up paving and damage foundations and pipes.

Fire risk. Some districts have concerns about having trees too close to buildings due to increased fire risk. This is particularly important for schools located in the urban–wildlife interface.

Site access and joint-use liabilities. Sometimes site access is needed for partners to maintain trees, especially during summer recess when campuses are closed. Some districts are concerned about liability and vandalism associated with allowing access to school property.

Slipping hazards. Districts and schools have concerns about not having enough maintenance capacity to clean up leaves, mulch, and fruit that drops onto paved areas, and some are concerned that those droppings may become slipping hazards.

Falling hazards. With an increased number of accessible trees on the schoolyard, school districts have expressed fears that students will attempt to climb the trees, fall, and get injured.

Obstructed supervisor sight lines. Many schools are understaffed and are concerned with not being able to supervise students if sight lines are obstructed by trees or plantings.

Allergies. Some school and district staff are worried about having trees and vegetation that cause allergies or attract bees.

Pests. Some district staff are concerned about the fact that having poorly maintained fruit-bearing trees, vegetable gardens, and dense vegetation may attract rats and other pests.

Mulch and engineered wood fiber. Some districts have concerns about not having the capacity to regularly maintain areas with loose materials such as bark mulch or engineered wood fiber and consequently fear that students may encounter sharp objects buried in these materials. In addition, if engineered wood fiber is used as a fall surface for play structures in lieu of rubber surfacing, districts fear that too much maintenance is required to retain adequate fall attenuation.

Insurance costs. Trees carry high insurance costs that are not reimbursable by state grants. This leads to districts planting small trees for liability reasons.



SAFETY AND LIABILITY OPPORTUNITIES

Develop resources for tree selection, planting, and maintenance for schools. To ensure that trees are selected and planted correctly, districts and schools need resources and technical assistance for tree selection, planting, and maintenance that are easy to use and appropriate for schoolyards.

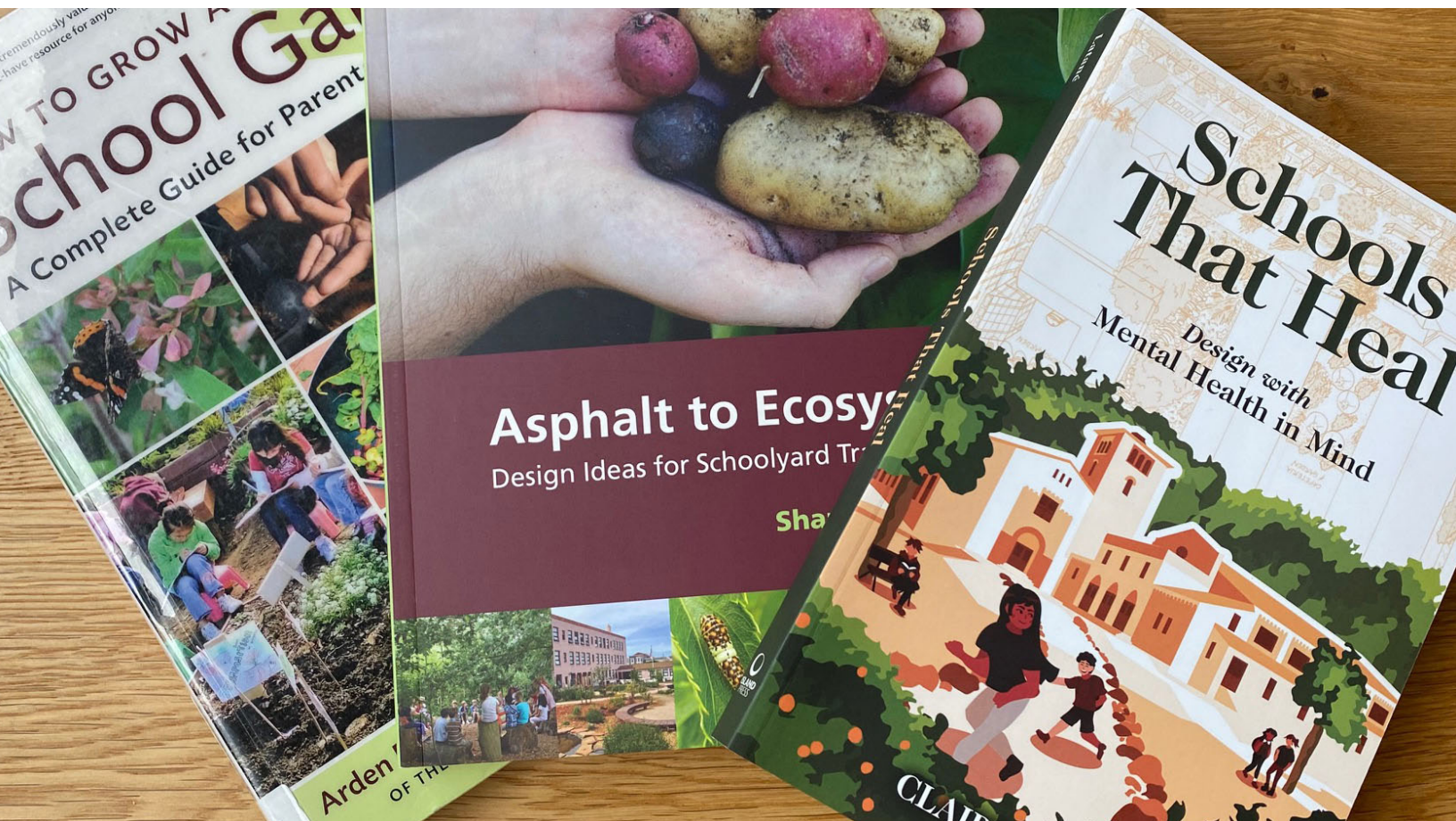
Research risks and benefits. Data and research on the risks and benefits that stem from having tree canopy and natural materials at schools will help districts take a more evidence-based and comprehensive approach to risk management.

Build awareness and community buy-in. Public education and outreach are needed to amplify existing research-based information about children's needs for challenge and physical play and to highlight the benefits of trees.

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What matters most to the school administration is improving test scores, and the connection between trees and learning is not clear.

SCHOOL DISTRICT STAFF MEMBER



Institutional Systems

Current public education systems and facilities are designed for outdated educational goals that were developed before hands-on learning, environmental literacy, and access to nature were seen as important to achieving educational outcomes. Some institutional systems need to adapt before school grounds can be used to their full potential to provide benefits for learning, health, and climate for students and communities.

CHALLENGES

Silos. In many cases the lack of communication and coordination across different departments and levels of scale (e.g., between instruction and facilities or between school communities and district facilities staff) represents a significant barrier to tree planting in schools. Districts' siloed structure sometimes leads to focusing on single outcomes rather than developing holistic and comprehensive solutions. In addition, the approval process for greening projects within school districts is usually not clearly defined or outlined.

Competing priorities. School districts have many other state requirements to meet. Since the link between green outdoor environments and educational outcomes is still not widely understood, greening and tree-planting projects are not prioritized over other types of investments.

Staff turnover. Public school districts and schools have high staff turnover. This means that when champions leave, and in the absence of an institutionalized system, greening projects may be abandoned and fail.

Outdated academic goals. Even though progress has been made, the link between green outdoor environments and educational outcomes is still not widely understood and embraced. Therefore, teachers may not have the support and training they need to be comfortable utilizing the outdoor spaces for learning other than for physical education or recess.

Facilities planning often omits outdoor learning and schoolyard greening. The long-term facilities assessment and planning process that most school districts conduct every five to 10 years usually focuses on buildings and sports facilities and does not include outdoor learning and access to nature as integral components. As a result, funding to create and maintain these outdoor learning spaces may be the first to be cut when funding is scarce and project costs increase.



INSTITUTIONAL SYSTEMS OPPORTUNITIES

Classify schoolyard forests as instructional spaces.

To increase investment in schoolyard forests, it is important to embrace them and classify them as valuable instructional spaces that are essential to students' health and learning.

Develop a school district policy for greening.

Having a district board policy that outlines a shared vision and commitment to supporting schoolyard forests and green schoolyards as ways to improve student health and learning is important for long-term success. The process to develop this policy needs to engage different school district departments, such as academic instruction, facilities, health, and wellness, and may include a shared vision for greening goals and implementation steps.

Institutionalize collaboration and communication.

Institutionalizing collaboration between instruction and facilities departments is critical to creating long-lasting schoolyard forests and green schoolyards. This collaboration should not rely on personal connections or individual champions and should be formalized through the creation of new positions and processes to foster alignment and communication.

Include schoolyard greening and tree-planting goals in the district facilities master plan. Districts should consider including schoolyard greening and tree-planting goals in the facilities assessment and master

planning process they usually undertake every five to 10 years. In addition to engineers and architects, it is essential that the facilities planning team includes arborists, educators, and landscape architects to ensure the process strategically includes outdoor spaces to improve learning and student well-being.

Develop additional district administrative regulations or guides.

In addition to a board policy and facilities master plan, districts may need to develop or adopt other resources to support their schoolyard forests. These resources can include design guidelines and standards for green schoolyards and schoolyard forests, a school forestry management plan including tree inventory software to tag and track trees, resources for teachers for outdoor education including classroom management and behavior, and standards-based curricula that make it an “educational necessity” to go outside.

Explore how county offices of education can support school districts.

County offices of education are set up to provide support for school districts, and it is worth exploring if they could assist districts as they establish and manage their schoolyard forests. This support may include technical assistance, professional learning, maintenance assistance, data tracking, connections to partners, and communication with administrators.



Paige Green

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Connections between leaders of facilities and leaders of instruction around this program area need to be made.

BAY AREA NONPROFIT STAFF MEMBER

Funding

Most of the traditional funding mechanisms that can be accessed to fund tree-planting and schoolyard greening projects focus on one-time investments instead of supporting ongoing activities and staffing needed for long-term success. Maintenance funding usually comes from school districts' general funds and competes with many other priorities. Therefore, maintenance funding may fluctuate from year to year, making it hard to plan for long-term tree care.

CHALLENGES

Lack of dedicated long-term funding for maintenance.

Most available public funding sources for facilities projects come from bonds and therefore focus on one-time capital investments. Compared to buildings and major capital projects, green schoolyards and schoolyard forests need smaller investments upfront and ongoing long-term operations and management funding to ensure survival well beyond installation.

Lack of funding and capacity for planning. For state grants, much of the planning for green schoolyards and schoolyard forests needs to happen before a grant application is submitted. However, there are very few funding sources school districts can access to pay for this pre-proposal work, which includes vitally important relationship-building and planning. Planning costs include conducting surveys and assessments of existing conditions, assessing community and stakeholder engagement to determine needs and priorities, and developing a schoolyard master plan through an iterative participatory design process.

Lack of capacity and resources to apply and administer grants. Much of the state funding for greening is available through state grants that require significant staff capacity from the applicant to develop the application and to administer the grant once it is awarded.

Reimbursement grants. Many state grants are reimbursement-based, and this financial structure can represent a significant burden to applicants. For example, CAL FIRE is able to provide advance payments only for nonprofits in cases of grantee hardship and when the project serves a disadvantaged or low-income community. This is not the case for other grants. This financial structure greatly limits the number of applicants since only the largest organizations—with access to construction capital—can afford to apply for and lead the resulting projects.

Unfunded overhead costs. Like most state grants, grants from the California Natural Resources Agency (CNRA) and CAL FIRE do not cover all the applicant's costs, particularly with regard to staff time and standard employment benefits. On the other hand, sub-consultants hired by the applicant are allowed to charge much higher hourly rates that can cover all of their costs. Tree-planting organizations estimate that once they get a state grant, they need to raise an additional 30% of the grant amount to cover unfunded project costs, which include staff costs and construction-related expenses.

Tree size restrictions. The CNRA Urban Greening Program only allows 15-gallon trees or smaller to be planted. In some cases it may be better to work with a mix of sizes to help create instant shade on schoolyards.

Tree species restrictions. CAL FIRE focuses only on large tree species, but sometimes there are plant availability and space constraint issues that require planting smaller species.



FUNDING OPPORTUNITIES

Create grant programs tailored to tree planting in schools. Green schoolyard and tree-planting grant programs—specifically created for schools—are needed both at the state and local levels. These grant programs should be designed to address some of the challenges of tree planting in schools and to capitalize on opportunities.

Connect schoolyard forest benefits to funding. The benefits of schoolyard forests—including improved health outcomes, increased student attendance, staff retention, improved academic performance, energy savings, carbon sequestration, and stormwater management—need to be adequately quantified and translated to monetary estimates to effectively advocate for the investments needed to create and sustain schoolyard forests. In addition, research on the benefits of schoolyard forests can help unlock additional funding sources and mechanisms related to health, natural resources, education, and climate.

Provide long-term sustainable funding for maintenance. Dedicated and long-term funding streams for schoolyard forest maintenance are necessary to ensure longevity of schoolyard forests. Funding for increased staff capacity and training is also needed to establish, manage, and monitor schoolyard forests over the long term.

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It is not about the number of trees we plant; it is about the character of the students and long-term care of people.

Wanda Stewart
COMMON VISION



State Policy

School districts and tree-planting organizations have mentioned certain policies and regulations as barriers to their schoolyard greening and tree-planting projects. Updating and aligning some of these policies presents a great opportunity to achieve multibenefit goals.

CHALLENGES

Physical education requirements. There is a perception that to meet state physical education (PE) requirements, school grounds “need” to have a large expanse of flat asphalt. Many PE standards are achieved with the use of competitive ball sports that require hard surfaces. The California Department of Education’s standards allow for flexibility in interpretation and enforcement of PE requirements. However, school districts continue to rely on expanses of asphalt and sports fields to meet those requirements because they do not have alternative information about how to meet the standards using natural environments.

Drought response measures. Water use restrictions are critical in California, but those requirements sometimes represent a barrier to organizations and districts thinking of embarking on tree-planting projects. Trees need irrigation during establishment to ensure they survive to eventually reach maturity and provide the full set of benefits. If irrigation is cut off as part of drought response, the investment in tree-planting and maintenance costs incurred up to that point is wasted.

Division of the State Architect’s permit process.

School districts and tree-planting organizations state that once a project is required to go through the Division of the State Architect’s (DSA) permit process, project costs and timelines increase significantly. Although planting and irrigation projects in unpaved areas are exempt from DSA review, asphalt-removal projects are considered alterations that under the California Building Code may trigger requirements for upgrades to accessibility elements outside the project area. The fear of triggering such extensive and expensive renovations prevents school districts from trying to make small incremental changes to old facilities that may have significant ADA noncompliance issues. The end result is that schools that most need renovation are the most difficult to address.



STATE POLICY OPPORTUNITIES

Provide technical assistance and resources for design.

School districts would benefit from having access to technical assistance, online best practice guides, and case studies that show how to create flexible multiuse schoolyard forest spaces that meet state requirements (e.g., ADA, fire access, and PE) and student needs (e.g., play, shade, access to nature, and outdoor learning).

Share resources through existing agency channels.

Technical assistance and resources could be effectively shared through existing agency communication channels, including CDE, DSA, CAL FIRE, and CNRA.

Update CALGreen and provide clarifications. The California Green Building Standards Code, also known as the CALGreen, is the first statewide green building standards code in the nation. CALGreen focuses mostly on buildings and energy savings, but it also includes a section with requirements to include shade trees. Although having this requirement is a good start, this section can be improved and expanded to be more impactful and actionable. The rule-making process to update California building codes is well established and happens regularly and provides a great opportunity for interagency collaboration and public input.

Update and clarify physical education standards.

Legislative action and funding are needed to update state PE standards and frameworks to ensure that these are up to date with the latest science. In the meantime, districts could benefit from technical

resources and case studies that show how current PE standards can be met with creative use of space that includes green schoolyards and schoolyard forests. Districts and teachers would benefit from non-sport-specific PE instructional ideas—complete with learning objectives related to PE content standards and FitnessGram assessments that can be successfully implemented in schoolyard forest spaces.

Exempt trees from drought-response requirements.

Climate change is exacerbating droughts by making them more frequent, longer, and more severe, and therefore it is important for state agencies and districts to encourage planting of climate-adapted, drought-tolerant tree species. However, agencies and districts should consider making trees exempt from drought-response requirements, especially during the establishment period, in order to eventually have a healthy urban forest canopy that will mitigate heat and other impacts of climate change.

Explore creating a state barrier-removal program.

Some of the major existing challenges to creating schoolyard forests, such as ADA noncompliance, could be tackled by dedicating funding and creating an interagency working group tasked with developing a barrier-removal program. This program could include funding and assistance for districts for ADA improvements, school sustainability master planning, plumbing and irrigation upgrades, and other unfunded needs that prevent them from being able to plant trees on their campuses.



Conclusion

To successfully transition away from outdated, treeless asphalt schoolyards, we need to build a shared understanding and awareness of the problem and its solution and invest in the creation of a new system for planning, designing, building, managing, and maintaining green schoolyards and schoolyard forests to ensure their success and sustainability—for generations to come.

This paradigm shift needs champions at leadership levels to work together to overcome barriers that stem from entrenched practices in existing institutions. Leaders need to break down silos and develop policies and structures to solve for multibenefit outcomes. For schoolyard forests to scale up and thrive, strong alignment needs to be built at the district and state levels to directly link outdoor spaces with instruction.

Schoolyard forests and green schoolyards are opportunities to address broader issues such as climate change, environmental justice, health and education disparities, and workforce development and job creation. Interagency collaboration is needed to solve these cross-sector problems.

Despite the existing challenges, this is a watershed moment for the green schoolyard movement. We have witnessed an increased awareness of the importance of trees as a key strategy to address the climate crisis, and there are a growing number of successful programs and projects internationally, nationally, and in California that can provide valuable lessons as we embark in this decades-long paradigm shift to create schoolyard forests across the state.

CALIFORNIA SCHOOLYARD FOREST SYSTEM

The California Schoolyard Forest System™ seeks to create schoolyard forests across PreK-12 public school grounds statewide to directly shade and protect students from extreme heat and rising temperatures due to climate change. This initiative was founded by Green Schoolyards America in partnership with the California Department of Education, the California Department of Forestry and Fire Protection, and Ten Strands.

For more information, visit: greenschoolyards.org/ca-forests



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ACKNOWLEDGMENTS

School Districts and County Offices of Education

Berkeley Unified School District, Los Angeles County Office of Education, Los Angeles Unified School District, Oakland Unified School District, Orange County Office of Education, Rialto Unified School District, Sacramento City School District, San Diego County Office of Education, San Diego Unified School District, San Francisco Unified School District, Santa Clara County Office of Education, Santa Clara Unified School District, Santa Cruz County Office of Education, Stockton Unified School District, West Contra Costa County Unified School District

Tree Planting Organizations and Design Firms

Bay Tree Design, Canopy, Common Vision, Friends of the Urban Forest, Growing Together, Los Angeles Neighborhood Land Trust, North East Trees, One Tree Planted, Our City Forest, San Gabriel Valley Conservation Corps, Tree Davis, Tree Fresno, Tree San Diego, TreePeople, Watsonville Community Forest

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FUNDING

Funding for the first phase of this initiative was provided by a grant administered by the California Department of Forestry and Fire Protection (CAL FIRE) Urban and Community Forestry Program, and private philanthropy.

PUBLISHER

© Green Schoolyards America — April 14, 2023

Photos by Green Schoolyards America unless otherwise noted.