children & nature NETWORK

green schoolyards FOR HEALTHY COMMUNITIES

BUILDING A NATIONAL MOVEMENT FOR GREEN SCHOOLYARDS IN EVERY COMMUNITY

ACKNOWLEDGEMENTS

Special thanks to our Principal Advisors on this project whose wisdom and experience is the foundation upon which any future efforts will stand.

Nilda Cosco, PhD, *Natural Learning Initiative, College of Design, NC State University*

Sharon Danks, *Green Schoolyards America*

Rochelle Davis, *Healthy Schools Campaign*

Jeanne McCarty, *REAL School Gardens*

Robin Moore, DiplArch, MCP, Honorary ASLA, *Natural Learning Initiative, College of Design, NC State University*

Jaime Zaplatosch, *Openlands*

We are especially indebted to those who provided the context and foundation for this work with early support for the relevance of the schoolyard to public health.

Zarnaaz Bashir, MPH, *National Recreation and Parks Association*

Jacqueline Epping, MEd, FACSM, *U.S. Centers for Disease Control and Prevention*

Howard Frumkin, MD, DrPH, MPH, *University of Washington School of Public Health*

Steven Kelder, MPH, PhD, *Michael & Susan Dell Center for Healthy Living, UT School of Public Health*

Harold W. Kohl III, PhD, MSPH, FACSM, *Michael & Susan Dell Center for Healthy Living, UT School of Public Health*

Stephen Pont, MD, MPH, FAAP, *Dell Children's Medical Center*

Autumn Saxton-Ross, PhD, *National Collaborative for Health Equity*

Andrew Springer, DrPH, *Michael & Susan Dell Center for Healthy Living, UT School of Public Health*

We appreciate the following people for their generosity of time and expertise in interviews and discussions throughout the course of this project.

Jodie Adams, *Springfield-Greene County Park Board*

Megan Andrada, *Landscape Structures*

Bryna Bass, *Rothenberg School, Cincinnati*

Adam Bienenstock, *Bienenstock Playgrounds*

Beth Bonnettte, *Woodrow Wilson Montessori, Houston ISD*

Judy Braus, *North American Association for Environmental Education*

Tina Briggs, *City of Boulder*

Lois Brink, MLA, *Learning Landscapes and the Big Sandbox*

Arden Bucklin-Sporer, *Education Outside*

Carmen Burks, *Safe Routes to School*

Victoria Carr, EdD, *University of Cincinnati*

Leesa Carter, *Captain Planet Foundation*

Gracie Cavnar, *Recipe for Success*

Louise Chawla, PhD, *University of Colorado at Boulder*

Wendy Cohen, *Life Lab, UC Santa Cruz*

Cam Collyer, *Evergreen*

Allen Cooper, *National Wildlife Federation*

Nette Compton, *Trust for Public Land*

Joe Davidson, *Great Outdoors Colorado*

Chad Dayton, *Wilderness Inquiry*

Rich Dolesh, *National Recreation and Parks Association*

Laura Duffey, *Minnesota School Forests*

Bob Farnsworth, *PlayCore*

Scott Feille, *REAL School Gardens*

John Fisher, *Life Lab, UC Santa Cruz*

Marya Fowler, *National Wildlife Federation*

Mark Hamre, *Mahomedi Public Schools*

Karen Harrison, *Minnesota School Forests*

Sarah Holway Bernardi, *DC Greens*

Bill Hopple, *Cincinnati Nature Center*

Meg Kelly, *Healthy Schools Campaign*

Christine Knapp, *Philadelphia Water Department*

Kim Martinez, *National Wildlife Federation*

Dee Merriam, FASLA, MCRP, *U.S. Centers for Disease Control and Prevention*

Kristin Metz, *Boston Schoolyard Initiative*

Lisa Moore, *PlayCore*

Ryan Mottau, *MIG Consulting*

Ann Mullen, *Austin ISD*

Mary Alice Lee, *The Trust for Public Land*

Greg Lais, *Wilderness Inquiry*

Jeff Ledermann, *Minnesota Department of Natural Resources*

John McCluskey, *Horizons K-8 School, Boulder*

Jackie Miller, *Great Outdoors Colorado*

Andrew Moore, *National League of Cities*

Richard Louv, *Author of "Last Child in the Woods"*

Connie O'Connor, *Cincinnati Nature Center*

Catherine Oliveros, *Blue Cross Blue Shield of Texas*

Kathleen Ownby, *SPARK Park, Houston*

Tom Norquist, *PlayCore*

Guillermo (Gil) Penalosa, MBA, PhDHC, *8-80 Cities*

Lynn Pinoniemi, *Landscape Structures*

Mikaela Randolph, MPP, *Safe Routes to Schools*

Nooshin Razani, M.D, MPH, *UCSF Benioff Children's Hospital*

Peggy Riggs, *Springfield R-XII School District*

Anna Riskin, *American Planning Association*

Alison Risso, *REAL School Gardens*

David Rouse, AICP, *American Planning Association*

Jennifer Seydel, *Green Schools National Network*

Anthony Staubach, *4-H Youth Development*

Betsy Townsend, *Leave No Child Inside Greater Cincinnati*

Sarah Walgast, *Big Thompson Elementary School, Loveland, CO*

Karan Wood, *Captain Planet Foundation*

©2016 CHILDREN & NATURE NETWORK

TABLE OF CONTENTS

Funding for this project has been provided by the W.K. Kellogg Foundation, to whom we are especially grateful for the continued engagement and inspiration in the effort to reach vulnerable children and families.

©2016 CHILDREN & NATURE NETWORK

GROUNDS FOR CHANGE

GREEN SCHOOLYARDS FOR ALL CHILDREN

At a time when children are experiencing high rates of stress, depression, obesity, diabetes and other health risks associated with sedentary lifestyles, they are also experiencing a disconnect from the natural world. The effects of this disconnect are particularly acute in densely populated, economically challenged urban neighborhoods where health risks are already high.

In many neighborhoods, the standard play space is a barren asphalt playground or a concrete slab surrounded by chain link fence–an environment that many people would find unsuitable in a kennel. Too many children have no access to quality school grounds. Too many school districts have decreased or eliminated recess and field trips. Nearly half of school administrators report having cut physical education to increase academic time-on-task. Recent research associates long hours of sitting with a raft of health risks, and yet these trends continue despite the urgency of what public health professionals call a "pandemic of inactivity."

At the same time, another growing body of scientific evidence suggests that the creation of nature-rich urban environments, including schoolyards with natural play spaces and gardens, can help improve physical and mental health, cognitive skills, creativity, and social bonding. New longitudinal studies also suggest that nature-rich schools can help raise standardized test scores. And children in low-income communities appear to benefit proportionally more from access to green space than those in higher-income communities.

Though many policy makers continue to view digital technology as a silver bullet for education, school districts that green their schools can expect a high rate of return on their investment. Schools can, in fact, be pro-tech and pro-nature. When classroom technology is balanced with hands-on active learning outdoors in natural environments, the benefits of both approaches are multiplied. By using more of their senses, by moving their bodies, by experiencing the awe and wonder of nature, tech-savvy children can maximize the abilities and skills that come from both the natural and the virtual worlds.

Opportunities to take students outside into more natural environments can also reduce teacher burnout, according to one study. Natural schoolyards can strengthen the social fabric of the wider community. During the school day, they provide opportunities for children to play and learn in nature; and when these green oases are opened to the public after hours and on weekends, families spend more quality time together, elders enjoy walking paths and sitting peacefully outdoors among neighbors, and children enjoy more active and independent play in safe places.

The children and nature movement will be effective only in a wider context of social, economic and racial justice. It must value the inherent capacities within communities, including existing social networks, local wisdom and inventiveness, and cultural knowledge about the natural world. While not a panacea, the creation of green schoolyards is one way to assure that all children–not just some–receive the gifts of nature so essential to mind, body and spirit.

Richard Louv
Author, "Last Child in the Woods"
Chairman Emeritus
CHILDREN & NATURE NETWORK

Margaret Lamar
Director of Strategic Initiatives
CHILDREN & NATURE NETWORK

©2016 CHILDREN & NATURE NETWORK

GREEN SCHOOLYARDS FOR HEALTHY COMMUNITIES

The Children & Nature Network envisions a world in which all children play, learn and grow with nature in their everyday lives.

We fulfill this vision by building networks of organizations and individuals, developing leaders, and fueling scalable strategies for whole-community wellness through contact with the natural world. Two years ago, we took on the question of how to create greater impact in the important connection between health and nature. We collected all of the ideas that our networks had articulated over the previous nine years and created a list of 13 viable strategies, which included engaging pediatricians in park prescriptions, partnering with hospitals, helping health agencies infuse nature into obesity prevention programs, and many other ideas which could be put under the "Health" banner. Given the rising popularity of shared use agreements and co-location of schools and parks to increase physical activity, we added *green schoolyards for whole communities* to the list, and we took a good look at where we thought we could make the most headway for children.

With only a small fraction of public schoolyards in the U.S. having any kind of natural outdoor learning area, we realized that by creating access to green space on schoolyards in every community—the only public lands specifically allocated for use by children—we could have lasting impact on children's health and well-being, particularly the most vulnerable children. Research convincingly demonstrates that green space is sparser in low-income communities and health risks are higher. We at the Children & Nature Network have committed to building a strategic intervention for low-income communities where the many benefits of the natural environment can mediate stress in children and create whole-community resilience and vitality.

For several decades, pioneers have fueled garden-based education and promoted school-based nature play and learning for children. Community organizations, city governments, and schools have come together on the schoolyard to install, maintain, and financially support community vegetable gardens, nature trails, wildlife sanctuaries, orchards, water conservation systems, wetland boardwalks, and many other forms of green space. These initiatives are often sited on previously barren schoolyards, replacing asphalt with engaging, ecologically diverse learning environments and community parks. These natural spaces are used as outdoor classrooms to enhance learning outcomes and create daily wellness for the children they serve. However, until recently there has been little rigorous science to make the case that green schoolyards affect children's health and academic performance. Moreover, the green schoolyard movement has been somewhat fragmented and under-resourced, relying on unevenly distributed local partnerships and funding. Green schoolyards remain a good idea that has not yet made it into mainstream school policy or programming.

With the research on green schoolyards mounting, we are seeing significant findings pointing to the stress-reduction, increased focus, academic performance, and now the physical activity that is possible when children engage in these spaces. The rise in interest in shared use of school grounds is beginning to show how the entire community

©2016 CHILDREN & NATURE NETWORK

benefits both from the social cohesion in families, but also the increase in physical activity that these spaces invite. The mainstream media outlets are picking up on the stories of community and individual transformation when children engage in urban farming or ecological stewardship at school. And yet, there is still a distance to travel to have decision-makers fully understand the multiple benefits of these green school grounds.

One of our biggest challenges is that transforming these spaces into living landscapes is not easy for schools. Asphalt requires little maintenance, no school staff training, and little additional subsequent funding. School grounds with green lawns that are bereft of any biodiversity can be mowed quickly and cheaply. But the cost to children's mental and physical health is great when these barren spaces are the only places children have to play and learn. Green schoolyards, when done well, require strong partnerships, teacher training, and on-going maintenance and engagement by the whole school community. All of this takes commitment, know-how, resources and time, which pose challenges for schools.

So, we have a choice to make. We can let communities figure out how to gather their own funding and expertise to follow this trend of converting schools into safe, rich places for nature contact. Or we can pull together the leaders in the field, expand the network to other relevant sectors, and collectively coordinate funding, policy change, partnership building, training and community engagement to strive for deeper impact with higher rates of success in more communities. We believe that a coordinated effort is the only way to achieve scale and to reach beyond the well-resourced communities into places where children need green schoolyards the most.

Children in Washington D.C. benefit from a district-wide School Garden Program.

©2016 CHILDREN & NATURE NETWORK

GREEN SCHOOLYARDS
FOR HEALTHY COMMUNITIES

Children & Nature Network envisions nature-rich environments on school grounds in every community where children learn and play and where communities enjoy access to public school grounds.

THE PROJECT

It is with this vision in mind that Children & Nature Network (C&NN) launched the ***Green Schoolyards for Healthy Communities*** project—a listening tour across the U. S. to engage experts and a wide variety of cross-sector stakeholders to determine how we might marshal resources and grow this good idea into a nationwide movement that includes all of the relevant players from public health, urban planning, medicine, environmental agencies, municipal government, economic development, and many other groups whose purposes could be served with community green space on public school grounds.

For the purposes of this project, the term "green schoolyards" is defined as school grounds where natural elements are present and abundant. These might include diverse terrain; natural features such as flowers, trees, edible plants, logs, sticks, boulders, rocks, sand and water; gardens that support wildlife and food growing; natural play structures with loose parts and climbing structures; paths and trails; gathering places and outdoor classrooms; solar and other energy features; rain water catchment; and mechanisms to capture stormwater runoff. We also recognize that these natural elements are often placed in contexts with "traditional" playgrounds with play equipment, courts and fields for sports engagement, all of which we consider part of a green schoolyard that maximizes play value for children. In some places, school grounds go well beyond what we would consider a "yard" but include expansive land and even coordinated usage of nearby public lands.

Through a series of interviews, discussions, focus groups, and convenings we sought to answer these 5 key questions:

- How do we elevate the value of green schoolyards to decision-makers? What opportunities are present to increase awareness—immediate or long-term?
- How can disparate efforts and networks across the U.S. be connected, coordinated and supported to scale the prevalence of green schoolyards?
- What types of resources are needed to support a national green schoolyard movement?
- How are we currently measuring the impact of green schoolyards?
- What strategies could build the capacity, infrastructure, and resources to significantly increase the number of green schoolyards across the U.S.?

©2016 CHILDREN & NATURE NETWORK

This field investigation included a variety of methodologies, all of which informed one another.

1. SCIENTIFIC LITERATURE REVIEW

A team of researchers conducted a thorough review of the existing literature on several topics related to the intersection of children and nature. The particular lens of green schoolyards was applied in five key areas of research: education, physical health, mental health, design, and impact on low-income communities. That expansive research collection is housed in the Children & Nature Network's Research Center where articles, abstracts and sources can be found in a searchable database: www.childrenandnature.org/learn/research-resources

2. EXPERT ENGAGEMENT, FOCUS GROUPS AND SITE VISITS

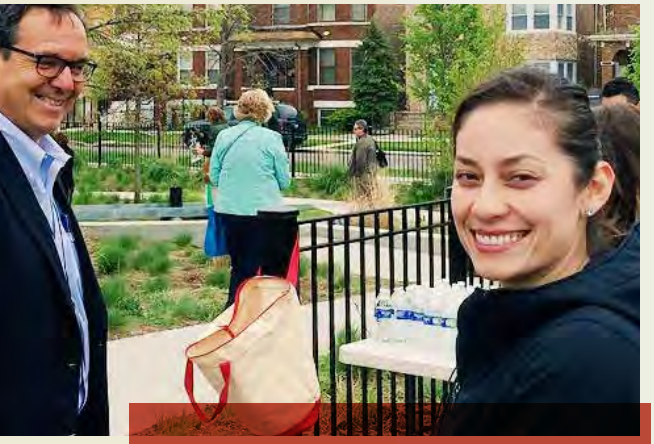
In order to gain insights and expertise from those doing the work on the ground in communities, we engaged leaders of target green schoolyard initiatives and organizations in 16 cities across the U.S. When possible, those organizations hosted focus groups and site visits and provided additional opportunities to engage with their local stakeholders in order to gain a broader understanding of their work. In these community focus groups and site visits, we sought to better understand the design, programming, and specific neighborhood contexts of the initiatives. Representatives of the Children & Nature Network visited the following cities:

- Chicago
- New York City
- Washington D.C.
- Dallas/Ft. Worth
- San Francisco
- Santa Cruz
- Cincinnati
- Berkeley
- Houston
- Atlanta
- Minneapolis/St. Paul
- Denver
- Boulder
- Austin

©2016 CHILDREN & NATURE NETWORK

GREEN SCHOOLYARDS
FOR HEALTHY COMMUNITIES

Children & Nature Network
2015 Conference



National Green Schoolyard
Summit, 2015

3. KEY INFORMANT INTERVIEWS

We set out to talk to ten key leaders in the field, and, with the cross-sector relevance of this work, we found that there were many more interviews and discussions needed to generate a reliable set of recommendations for a way forward with broad national reach. We engaged over 75 professionals who spanned the following disciplines:

- K-12 public schools
- Early childhood education
- Youth development
- Wildlife & conservation
- Parks & recreation
- School gardens
- Green schools
- Public health
- School health
- Physical education & physical activity
- Health care & pediatrics
- Public policy advocacy
- Urban planning
- Landscape design
- Built environment planning
- Academia

4. ACTION LAB CONVENING

The Children & Nature Network convened over 400 leaders in the children and nature field at the inaugural C&NN International Conference in April 2015 in Austin, Texas. At that event, we conducted a panel presentation on best practices and a 2 ½-hour Action Lab, where 26 professionals engaged in strategic planning for growing a national movement for the future of green schoolyards.

5. NATIONAL GREEN SCHOOLYARD SUMMIT

Healthy Schools Campaign and Openlands, in partnership with Children & Nature Network, hosted a summit in May 2015 in Chicago to galvanize the green schoolyard movement. Cross-sector leaders from 48 organizations across the U.S. spent one and a half days together hearing from experts and generating strategies for expansion of policies, programs, and funding for systematic scaling and replication of green schoolyards.

©2016 CHILDREN & NATURE NETWORK

OUTCOMES: A Roadmap for The Movement

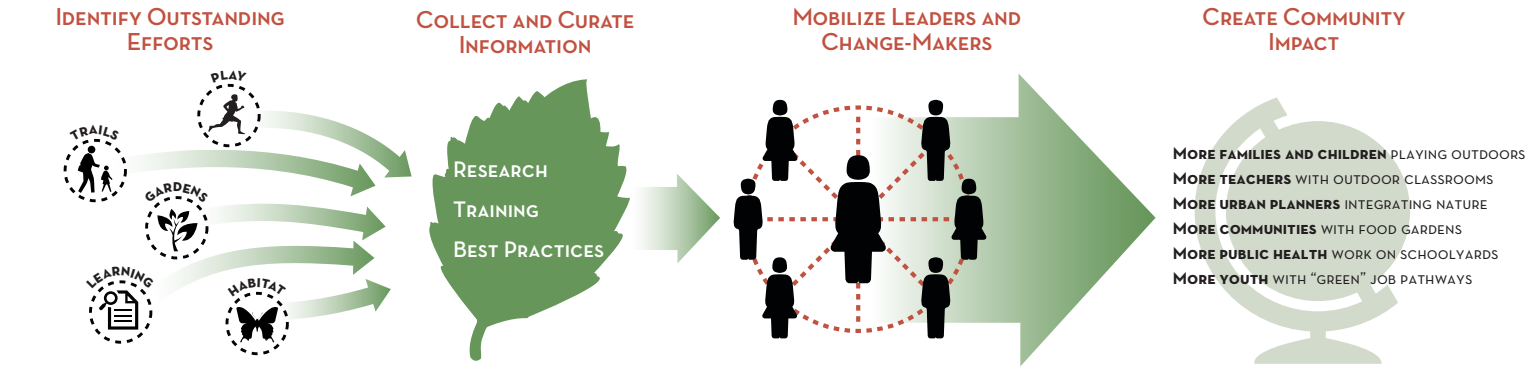
As a result of these multiple methods of engagement, we are presenting here in this document a potential roadmap for the future of this movement. We are condensing rich and complex discussions into a form that we hope will be practical and useful not only to those experts and leaders who are self-selected advocates, but also to a broader audience of change-makers, whether they be parent activists in one community, mayors of large cities, or leaders of national agencies.

This document is not a how-to guide, and it is not a prescription for what we must do to move the needle on creating more green schoolyards. Rather, it is a collection of thinking about what is possible. Section 1 discusses the benefits of green schoolyards, and points to the many possibilities for partnerships and to the need for more research to be collected to help us successfully make a broader case. Section 2 on components for implementation provides a map for evaluating existing and future implementation models and helps us to see how some of the leaders in the field are approaching each component. Section 3 presents a set of recommendations in the form of a Framework for Action, which we hope will be a starting point for a collective national agenda. It is our intention for the components of the report to be practical as separate pieces that can be pulled out and used as needed to address a variety of audiences in the field.

THEORY OF CHANGE

As a result of this field investigation, a theory of change emerged that we are currently using for our work on the C&NN Research Center. We believe that this theory of change is easily applied, as demonstrated here, to the Green Schoolyard Movement to address some of the components of the recommended Framework for Action. This report represents a preliminary phase of *identifying outstanding efforts* and *collecting and curating information* for the field. Our next challenge is to collectively build up the needed resources to mobilize an army of leaders and change-makers across the country for deeper impact in creating green schoolyards in all communities.

Galvanizing Efforts for a National Green Schoolyard Movement



Quality programs, research and efforts are happening in pockets across the world, but they are often in silos without connection between sectors, organizations, or institutions.

C&NN fuels a connected network by:
- Collecting research
- Conducting trainings
- Promoting best practices
- Reporting the news

C&NN inspires people across the world to use the resources to create actions in their communities:
- Policy change
- Partnerships across sectors
- Funding
- Sustainable implementation

Worldwide community impact is ignited and sustained through replicating and scaling efforts across sectors.

©2016 CHILDREN & NATURE NETWORK

THE BENEFITS OF GREEN SCHOOLYARDS TO CHILDREN, FAMILIES, & COMMUNITIES

Green schoolyards provide a powerful opportunity to address many community benefits at once. Each community has compelling reasons for developing a green schoolyard--some are interested in creating gardens for growing vegetables or habitat for pollinators; others are interested in outdoor hands-on science instruction to boost academic achievement. Increasingly, we see that communities are creating parks on school grounds, and cities are using this public acreage to manage stormwater. What makes this a strategic intervention in communities is that whichever of these benefits ignites the initial actions, the other benefits follow. Green schoolyards can increase the public value of any investment through this impact multiplier effect. With limited resources available for schools, we should see this aggregated value as a tool to bring new partners and new funding streams to the green schoolyard movement for the benefit of children, families and whole communities.

In this section of the report, the Children & Nature Network offers summaries of the most recent research on a subset of benefits—those that we feel most directly affect vulnerable children: academic achievement, physical activity, mental health, social-emotional skills, and beneficial play.

©2016 CHILDREN & NATURE NETWORK

GREEN SCHOOLYARDS CAN IMPROVE ACADEMIC OUTCOMES

THE ISSUE

Only 1/3 of U.S. 8th graders perform at or above standards for science and math.[1]

SCHOOLS ACROSS THE NATION ARE SEEKING WAYS TO IMPROVE ACADEMIC OUTCOMES FOR ALL STUDENTS

Green schoolyards promote academic achievement through hands-on, experiential learning and by enhancing the cognitive and emotional processes important for learning.

ENHANCING LEARNING

Green schoolyards provide **experiential learning across many subjects.**[2,3]

33 of 40 school garden studies (83%) found

IMPROVED OUTCOMES in science, math & language arts.[2]

GREEN SCHOOLYARDS CAN

- Help students focus attention and regulate behavior[5,6]
- Enhance attitudes and engagement with school[7,8]
- Support creativity, critical thinking and problem solving[9]

ROOM WITH A VIEW

Seeing nature and greenery from school buildings can foster positive academic outcomes.[10,11]

HIGH SCHOOLERS WITH VIEWS OF TREES HAD:[12]

- **HIGHER** standardized test scores
- **HIGHER** graduation rates
- **HIGHER** % of students planning to attend a 4-yr college

SUPPORTING RESEARCH

[1] www.nationsreportcard.gov [2] Williams & Dixon (2013). Impact of garden-based learning on academic outcomes in schools: Synthesis of research between 1990 and 2010. *Rev Educ Res*, 83(2), 211–235. [3] Wells et al. (2015). The effects of school gardens on children's science knowledge: A randomized controlled trial of low-income elementary schools. *Int Journal Sci Educ*, 37(17), 2858–2878. [4] Berezowitz et al. (2015). School gardens enhance academic performance and dietary outcomes in children. *J School Health*, 85(8), 508-518. [5] Berto et al. (2015). How does psychological restoration work in children? An exploratory study. *J Child Adolesc Behav* 3(3). [6] Chawla et al. (2014). Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. *Health Place*, 28, 1–13. [7] Maynard et al. (2013). Child-initiated learning, the outdoor environment and the 'underachieving child.' *Early Years*, 33(3), 212 - 225. [8] Rios & Brewer (2014). Outdoor education and science achievement. *Appl Environ Educ Commun*, 13(4), 234–240. [9] Kellert (2005). *Building for life: Designing and understanding the human-nature connection*. Washington, DC: Island Press. [10] Li & Sullivan (2016). Impact of views to school landscapes on recovery from stress and mental fatigue. *Landscape Urban Plan*, 148, 149-158. [11] Wu et al. (2014). Linking student performance in Massachusetts elementary schools with the "greenness" of school surroundings using remote sensing. *PLoS ONE 9(10): e108548: 1-9*. [12] Matsuoka (2010). Student performance and high school landscapes: Examining the links. *Landscape Urban Plan*, 97(4), 273–282.

ADDITIONAL RESEARCH USED FOR THIS INFOGRAPHIC AVAILABLE AT childrenandnature.org/gsybibliographies

C&NN recognizes that not all studies support causal statements.

©2016 CHILDREN & NATURE NETWORK

GREEN SCHOOLYARDS CAN INCREASE PHYSICAL ACTIVITY

THE ISSUE

Less than 3 in 10 high school students get 60 minutes of physical activity every day.[1]

REGULAR PHYSICAL ACTIVITY ENHANCES WELL-BEING & ATTENTIVENESS IN THE CLASSROOM.

Green schoolyards can promote physical activity by offering a variety of active play options that engage children of varying fitness levels, ages and genders.

MORE OPTIONS, MORE ACTIVITY

85%
OF EDUCATORS AND PARENTS
said green schoolyards support a wider range of play activities than other types of schoolyards.[2]

PROMOTE
running
jumping
climbing
lifting[2]

trees
logs
shrubs
rocks

Variety in landscaping increases variety in active play.[2]

MEETING DIVERSE & CHANGING NEEDS

GREEN SCHOOLYARDS COMPLEMENT CONVENTONAL PLAYGROUNDS WITH OPPORTUNITIES FOR
LIGHT & MODERATE PHYSICAL ACTIVITY
that are more appealing to some children.[3,4]

GREEN SCHOOLYARDS CAN CONTRIBUTE TO
GIRLS' PHYSICAL FITNESS

Physical activity decreases as children grow, especially for girls. Green schoolyards sustain activity as children age and preferences change.[5,6,7]

SUPPORTING RESEARCH

[1]www.cdc.gov/physicalactivity/data/facts.htm [2]Dyment & Bell (2008). Grounds for movement: Green school grounds as sites for promoting physical activity. *Health Educ Res*, 23(6), 952–962. [3]Barton et al. (2015). The effect of playground- and nature-based playtime interventions on physical activity and self-esteem in UK school children. *In J Environ Health Res*, 25(2), 196-206. [4]Dyment et al. (2009). The relationship between school ground design and intensity of physical activity. *Child Geogr*, 7(3), 261-276. [5]Brink et al. (2010). Influence of schoolyard renovations on children's physical activity: The Learning Landscapes Program. *Am J Public Health*, 100(9), 1672–1678. [6]Mårtensson et al. (2014). The role of greenery for physical activity play at school grounds. *Urban For Urban Gree*, 13(1), 103–113. [7]Pagels et al. (2014). A repeated measurement study investigating the impact of school outdoor environment upon physical activity across ages and seasons in Swedish second, fifth and eighth graders. *BMC Public Health*, 14(1), 803.

ADDITIONAL RESEARCH USED FOR THIS INFOGRAPHIC AVAILABLE AT childrenandnature.org/gsybibliographies

C&NN recognizes that not all studies support causal statements.

©2016 CHILDREN & NATURE NETWORK

GREEN SCHOOLYARDS CAN PROVIDE MENTAL HEALTH BENEFITS

THE ISSUE

1 in 5 children has, or has had, a serious mental health disorder at some point in their lives.[1]

MENTAL HEALTH PLAYS A CRITICAL ROLE IN THE COGNITIVE, EMOTIONAL, & SOCIAL DEVELOPMENT OF CHILDREN AND YOUTH.

Green schoolyards can enhance mental health and well-being and promote social-emotional skill development.

GREEN SCHOOLYARDS HELP KIDS FEEL:

CALMER & LESS STRESSED[2,3]

Views of green landscapes from classroom windows helped high school students recover more quickly from stressful events.[4]

POSITIVE & RESTORED[3]

Forest schools enhanced positive and decreased negative emotions.[5]

RESILIENT[2]

Natural areas enhanced feelings of competence and increased supportive social relationships that help build resilience.[2]

GREEN SCHOOLYARDS PROMOTE SOCIAL-EMOTIONAL SKILLS

PRACTICE

RELATIONSHIP SKILLS[2]

Children demonstrated more cooperative play, civil behavior and positive social relationships in green schoolyards.[6,7]

DEVELOP

SELF-AWARENESS & SELF-MANAGEMENT

Green schoolyards can reduce aggression and discipline problems.[6,7]

Gardening at school helped students feel proud, responsible & confident.[2]

SUPPORTING RESEARCH

[1]www.nimh.nih.gov/health/statistics/prevalence/any-disorder-among-children.shtml [2]Chawla et al. (2014). Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. *Health Place*, 28, 1–13. [3]Kelz et al. (2015). The restorative effects of redesigning the schoolyard: A multi-methodological, quasi-experimental study in rural Austrian middle schools. *Environ Behav*, 47(2), 119-139. [4]Li & Sullivan (2016). Impact of views to school landscapes on recovery from stress and mental fatigue. *Landscape Urban Plan*, 148, 149-158. [5]Roe & Aspinall (2011). The restorative outcomes of forest school and conventional school in young people with good and poor behaviour. *Urban For Urban Gree*, 10(3), 205–212. [6]Bell & Dyment (2008). Grounds for health: The intersection of green school grounds and health-promoting schools. *Environ Educ Res*, 14(1), 77-90. [7]Nedovic & Morrissey (2013). Calm, active and focused: Children's responses to an organic outdoor learning environment. *Learn Environ Res*, 16(2), 281–295.

ADDITIONAL RESEARCH USED FOR THIS INFOGRAPHIC AVAILABLE AT childrenandnature.org/gsybibliographies

C&NN recognizes that not all studies support causal statements.

©2016 CHILDREN & NATURE NETWORK

GREEN SCHOOLYARDS ENCOURAGE BENEFICIAL PLAY

THE ISSUE

8-18 year olds in the U.S. spend an average of 7.5 hrs per day using entertainment media.[1]

KIDS NEED TO PLAY: PLAY SUPPORTS PHYSICAL, SOCIAL & EMOTIONAL WELL-BEING.

Natural areas promote child-directed free play that is imaginative, constructive, sensory rich and cooperative.

ENCOURAGING IMAGINATIVE, COOPERATIVE FREE PLAY

GREEN SCHOOLYARDS CAN SUPPORT DIFFERENT TYPES OF PLAY[2,4,7,8]

DRAMATIC PLAY
Loose parts—such as sticks, stones, acorns & pinecones—engage the imagination.

EXPLORATORY PLAY
Natural areas provide opportunities for children to explore.

SOLITARY PLAY
Areas under bushes or other nooks allow children to engage in alone time and contemplation.

CONSTRUCTIVE PLAY
Building things out of natural materials helps children learn hands-on skills.

LOCOMOTOR PLAY
Natural items such as logs and rocks can be carried. Looping paths allow walking, running and biking.

SUPPORTING RESEARCH

[1]Rideout et al. (2010). Generation M2: Media in the lives of 8-18 year olds. Kaiser Family Foundation https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8010.pdf [2]Dyment & Bell (2008). Grounds for movement: Green school grounds as sites for promoting physical activity. *Health Educ Res*, 23(6), 952–962. [3]Stanley (2011). The place of outdoor play in a school community: A case study of recess values. *Child Youth Environ*, 21(1), 185–211. [4]Dennis et al. (2014). A post-occupancy study of nature-based outdoor classrooms in early childhood education. *Child Youth Environ*, 24(2), 35–52. [5]Luchs & Fikus (2013). A comparative study of active play on differently designed playgrounds. *J Adven Educ & Outd Learn*, 13(3), 206–222. [6]Acar & Torquati (2015). The power of nature: Developing pro-social behavior towards nature and peers through nature-based activities. *Young Children*, 70(5), 62-71. [7]Chawla (2015). Benefits of nature contact for children. *J Plan Lit*, 30(4), 433–452. [8]Cloward Drown & Christenson (2014). Dramatic play affordances of natural and manufactured outdoor settings for preschool-aged children. *Child Youth Environ, 24(2), 53–77.*

ADDITIONAL RESEARCH USED FOR THIS INFOGRAPHIC AVAILABLE AT childrenandnature.org/gsybibliographies

C&NN recognizes that not all studies support causal statements.

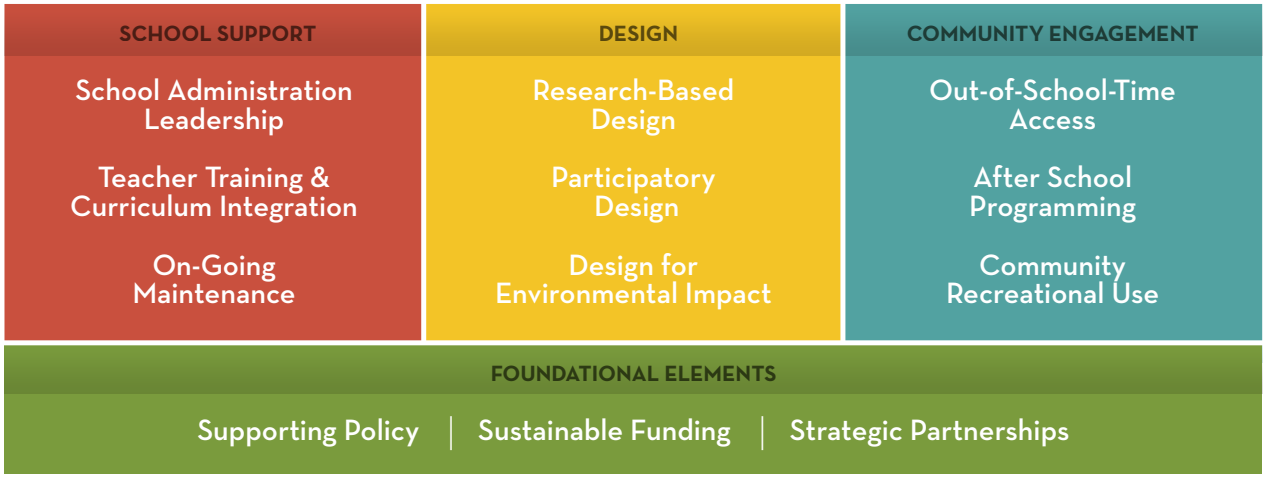
©2016 CHILDREN & NATURE NETWORK

THE COMPONENTS FOR SUCCESSFUL IMPLEMENTATION OF GREEN SCHOOLYARDS

Communities implement green schoolyards in diverse ways, making them uniquely responsive to the resources and desires of the people they serve. The diagram below represents the ways that initiatives across the U.S. are putting various goals and elements together to create successful models, yet no one initiative has all components in place. For example, those initiatives which are strongly focused on providing an outdoor classroom for academic achievement often have strong administration support and teacher training, yet may have little out-of-school time access. Others focused on shared use of the school grounds by the community may have strong funding, policy and maintenance, but little focus on curriculum integration. By outlining these components we do not intend to evaluate program success by these criteria, but we do intend to demonstrate that these are the elements which are possible to create successful green schoolyards that are sustainable over time.

green schoolyards

COMPONENTS FOR SUCCESSFUL IMPLEMENTATION



©2016 CHILDREN & NATURE NETWORK

THE FRONTLINE OF THE MOVEMENT: EXISTING MODELS & PROMISING PRACTICES

Sharing best practices for green schoolyards is complex for two primary reasons: first, the mere definition of "what's working" may vary by community and by each initiative's goals. For example, when a city water department is successfully managing its stormwater on the schoolyard and children are gaining environmental literacy as a by-product, that could be a homerun for that initiative; whereas another initiative might see community physical activity spike with the implementation of a school park—again, a huge success. Various practices are in place that make each successful, and the components of the implementation model that are put in place will drive outcomes. Second, sharing the "best practices" for green schoolyards poses challenges because evaluation of green schoolyard initiatives is sorely lacking in both depth and breadth, making it almost impossible to base future decisions on previous research. If we want to build initiatives that are sustained and supported in the long-term, we just don't have a strong set of data to determine which components work best over others. We do have emerging research that demonstrates some of the benefits of green schoolyards to children, and while there is also some research on outcomes for specific design elements, the exact components of green schoolyard initiatives that make these environments work over time needs more rigorous research and program evaluation.

In our investigation of the green schoolyard field, we discovered a variety of models for implementing green schoolyards that are both responsive to community needs and demonstrate positive outcomes for children. Communities identified their desired outcomes and designed schoolyards to achieve them–some focused on learning outcomes, while others focused on community place-making or environmental issues. Communities used the following three models in a variety of combinations to maximize the community benefit of the schoolyard transformation:

1. **SCHOOL PARKS** where there is a significant transformation of the school grounds with a stipulation that the community will have access to the space during non-school hours
2. **OUTDOOR CLASSROOMS** where the focus is on learning across the curriculum during school hours
3. **ECOSYSTEM SERVICES** where issues such as excess stormwater, heat islands, and poor air quality are mitigated by green infrastructure and urban greening

In this section of the report, we will map some of the strengths of these initiatives onto the various components of a green schoolyard to demonstrate some possibilities for moving forward in each of these areas.

FOUNDATIONAL ELEMENTS:
Supporting Policy, Sustainable Funding & Strategic Partnerships

There are green schoolyards sprinkled across the U.S., and they are implemented in a wide variety of ways. When policy is not in place to support them, these rich sites for learning and play for the community are at risk for failure. Without policy to support them, they may have unstable funding sources, they may get off the ground in smaller increments and lack the momentum or infrastructure to sustain support over time. Policy can make a world of difference in fueling the funding that enables the people in the community to create these spaces. Policy that is currently in place for green schoolyards is found mostly at the city or school district level and in a few instances at the state level.

©2016 CHILDREN & NATURE NETWORK

THE FRONTLINE OF THE MOVEMENT:
EXISTING MODELS & PROMISING PRACTICES

CITY AND SCHOOL DISTRICT SUPPORT

Local bonds have shown to be opportunities to achieve scale in green schoolyards across a city. **SAN FRANCISCO UNIFIED SCHOOL DISTRICT** passed three separate bonds in 2003, 2006 and 2011 that included funding specifically for green schoolyards across the district. Nearly $15 million was secured to implement public green schoolyards, and as a result, 54 previously asphalt or otherwise barren spaces have been transformed into living landscapes to enhance children's well-being, with many more slated for implementation in the coming years. A "greening department" was established in the SFUSD School Bond office, and schools awarded the funds were allocated $150,000 for a one-year master planning process and implementation of the site. However there were no funds allocated for maintenance, so schools and their communities remain responsible for sustaining that investment, which points to a gap that some believe creates disparities in the usage of these schoolyards for the full benefit of all children. This rich context of new schoolyards provides the demand for **EDUCATION OUTSIDE**, an organization that played a key role in advocating for the school bonds, provided strategic support in the construction and design phase, and now partners with SFUSD to deliver science programming and garden stewardship in more than 50% of the district's elementary schools.

Similarly, **DENVER PUBLIC SCHOOLS** was able to generate public support that resulted in bonds that allowed the work to go to scale throughout the city. In an entrepreneurial public/private effort, $10.6 million was raised to support the transformation of 22 schoolyards. The groundswell of public support generated by this initial effort allowed for the passing of two bonds that allocated a total of $40 million for playground transformation fueled by **LEARNING LANDSCAPES**. The focus of this initiative was on providing rich opportunities for children to increase diversity of play in environments designed to increase physical activity and physical competencies. As a result of these bonds, Learning Landscapes has transformed 96 elementary playgrounds into areas that provide opportunities for community engagement through shared use of the school grounds as community parks and play areas. This approach to leverage local partnerships and leadership to pass local bonds provides us a strong model for achieving large-scale school ground transformation that includes green space available to the whole community.

Children across Denver received Learning Landscapes after two bonds passed to transform school playgrounds.

CHICAGO PUBLIC SCHOOLS (CPS) passed a daily, district-wide recess policy that included funding for playgrounds at schools where there were none and to replace playgrounds for those in need. Around that time, the two water utilities in the City of Chicago were looking for ways to control stormwater through green infrastructure. **HEALTHY SCHOOLS CAMPAIGN** and **OPENLANDS** initiated discussions among the school district and water management agencies to achieve mutually benefical goals, which ignited the **SPACE TO GROW** initiative. The initiative facilitates the school district/city partnership and provides additional expertise, design, use, and maintenance for school ground transformations that

©2016 CHILDREN & NATURE NETWORK

THE FRONTLINE OF THE MOVEMENT:
EXISTING MODELS & PROMISING PRACTICES

include new play areas, outdoor classrooms, natural plantings, school gardens, and management of rain water and excess stormwater. Each year, six schools are slated to receive $1.5 million each for school ground implementation from three sources: 1) Chicago Public Schools, 2) the Chicago Department of Water Management and the Metropolitan Water Reclamation District of Greater Chicago, and 3) the Space to Grow partnership between Openlands and Healthy Schools Campaign. This Space to Grow partnership enables the school district and the city to collaborate and pool its resources to create true transformation not only of the school grounds, but the whole community through increased access to recreation and park space. Space to Grow connects the needs of the neighborhood, the city and the schools with multi-year support and implementation expertise. Both Openlands and Healthy Schools Campaign serve vital roles in facilitating the multiple partners involved in the Space to Grow initiative, making it a strong model for schoolyard green infrastructure replication in other communities.

PHOTO CREDIT *Openlands*

STATE CONSERVATION AND NATURAL RESOURCE FUNDS

Statewide conservation funds offer some opportunity to implement green space and nature contact on the schoolyard. As part of the statewide lottery funding in Colorado, **GREAT OUTDOORS COLORADO** (GOCO) fuels conservation efforts across the state. In an effort to address the growing disconnect between children and nature in valuing and stewarding these public lands, GOCO began the School Play Yard Initiative, and in its first three years it has constructed 30 new green schoolyards. The Play Yard Initiative offers competitive grants of approximately $100,000 to city/school partnerships to design and build green schoolyards that include opportunities for nature play and learning. While it may not be easily applicable to apply state lottery funding in other locations, this initiative serves as an important model for applying conservation-based policy and funding to capital projects on school grounds, where dollars had been previously designated for other public lands such as state and municipal parks.

Conservation and natural resource departments within state agencies can also be activated to apply their outreach and education on school grounds. With the passing of the Minnesota School Forest Law in 1949, public education institutions in Minnesota can establish and maintain parcels of land for community services and educational purposes. Run through the Minnesota Department of Natural Resources (DNR), the **MINNESOTA SCHOOL FOREST PROGRAM** encourages schools to co-manage their public school land with the DNR for the full educational benefit of the children. School Forests across Minnesota range in size from one to 300 acres in urban, suburban, and rural communities. While this kind of acreage may not available in urban centers, the concept of co-management of land of any size to instill the conservation ethic in young people is taking hold in other states beyond Minnesota. The Minnesota DNR provides ongoing training and curriculum resources along with valuable expertise as children, community members and professionals work alongside one another to install natural areas such as native prairies and trail systems. These trail systems are used year-round by the physical education teachers for hiking and snow-shoeing, and teachers across the curriculum use the spaces for learning. Families and the neighboring community engage in the projects on the school grounds and enjoy access for recreation and stewardship projects with the children.

©2016 CHILDREN & NATURE NETWORK

THE FRONTLINE OF THE MOVEMENT:
EXISTING MODELS & PROMISING PRACTICES

REAL School Gardens "Big Dig" Community Event

"We want to be a partner with REAL School Gardens in every sense of the word—beyond the check. We love to have opportunities to engage our employees in the community. And the garden addresses so many health issues, including physical activity."

Dr. Catherine Oliveros
Blue Cross and Blue Shield of Texas

DIVERSE FUNDING SOURCES

While institutional funding sources driven by local and state policy can help build a foundation for a successful program, there are some initiatives that have built more diverse funding streams for longterm sustainability. **REAL SCHOOL GARDENS** began in Fort Worth, Texas in 2003 and has grown to more than 100 schools in Texas and the D.C. area, where the organization provides outdoor education instruction through garden-based learning. By raising a unique blend of funds from corporate volunteer days, foundation grants, and school program fees, the organization has achieved a sustainable growth rate of approximately 10% each year. REAL School Gardens partners with corporations such as Wells Fargo, FedEx, Blue Cross and Blue Shield of Texas, and Leidos, who advance their corporate missions by funding the educational, health, and environmental benefits school gardens provide. Fulltime staff is responsible for building these corporate partnerships, which comprise 50% of the organization's funding.

Similarly, the Houston **SPARK PARK** initiative, through a diverse and steadily growing funding stream, has been able to grow into one of Houston's showcase approaches to addressing green space disparity. The initiative was started in 1983 in response to a report led by the mayor's office which stated that to compete with other cities, Houston would need 5,000 more acres of park land. Since then, SPARK has built over 200 parks with a focus on providing more equity in access to recreation and green space throughout the city. Funding is allocated through a competitive process to implement play environments on school grounds with a clear stipulation for access to the space as a community park during non-school hours. Over the years, SPARK has developed strong and stable sources of funding, including significant support from federal Community Development Block Grants (CDBG) combined with Harris County funds, foundation support, several corporate and non-profit partnerships, and school district contributions. Long-standing relationships between Spark and its diverse set of funders have made the program sustainable and ensured its continued growth.

SPARK Park Outdoor Classroom, Houston

"We believe this funding model can be replicated, but there would be different players, different partners, and different systems in place to make it successful in other communities."

Kathleen Ownby
SPARK Park

©2016 CHILDREN & NATURE NETWORK

THE FRONTLINE OF THE MOVEMENT:
EXISTING MODELS & PROMISING PRACTICES

SCHOOL SUPPORT: *School Administration Support, Teacher Professional Development & Curriculum Integration*

If school grounds are to be used as outdoor classrooms for learning, it is ultimately those teaching the children who are going to make that happen and who will determine the quality, frequency, and long-term impact of that learning. There are several variations of support for teachers in the outdoor classroom that can be condensed into two models that are used separately and, in some instances, in tandem:

1. Providing teachers with hands-on training to build their own proficiencies in teaching outdoors with the expectation that they will be conducting outdoor learning independently at a future date; and
2. Organizing a system of support so that there is an outdoor education specialist or a school garden coordinator who prepares and delivers the instruction directly to the children.

BUILDING PROFICIENCY IN TEACHERS

REAL SCHOOL GARDENS exemplifies this approach and spends three years training teachers to improve overall teacher practice and ensure that 60% of teachers at partner schools are regularly using the outdoor classroom. First, REAL School Gardens provides a full-day group training for the teaching staff. Then, REAL School Gardens works with teachers one-on-one during class to demonstrate how hands-on outdoor instruction can effectively reach academic goals. After receiving three years of teacher training, partner schools can opt-in to REAL School Gardens' "Evergreen" program to receive continued trainings, garden maintenance advice, and special projects and initiatives.

Real School Gardens teachers are trained over 3 years to teach independently in the outdoor classroom.

Additional initiatives across the country provide on-site and online teacher trainings to continue to offer professional development to teachers. Recipe for Success in Houston has long provided hands-on training to teachers on using the gardens for nutrition education and cooking classes. They have now created a training series meant to scale up with an online training video series where teacher participants must view and exhibit proficiency before unlocking new services within the program. National Wildlife Federation has a powerful model where they have partnered with Austin Independent School District to create a demonstration wildlife garden site at the central administration science education center. Teachers from the district come to the site and use the outdoor and indoor classroom space for intensive and on-going training to support their own proficiency to teach on their respective campuses. **LIFE LAB** in Santa Cruz has been recognized as the foremost provider nationwide of training for specifically implementing school gardens and garden-based outdoor learning. The team there offers a suite of professional development to build teacher proficiency, including workshops at their garden classroom in Santa Cruz, educator workshops at specific sites, school garden consulting, and a variety of webinars.

©2016 CHILDREN & NATURE NETWORK

THE FRONTLINE OF THE MOVEMENT:
EXISTING MODELS & PROMISING PRACTICES

PROVIDING DESIGNATED OUTDOOR LEARNING STAFF

With support stemming from the Healthy Schools Act in 2010, the **DISTRICT OF COLUMBIA OFFICE OF THE STATE SUPERINTENDENT OF EDUCATION (OSSE)** established a school garden program that offers a competitive grant process for schools to receive school garden funding. Schools receive up to $15,000 of support for three consecutive years to supplement the many services provided to the schools by local partnering organizations, and the grant stipulates that 80% of the funding provided must support a school garden coordinator. This coordinator position is key to maintaining the gardens, preparing lessons, and providing quality instruction to the students. They often work at more than one campus, providing daily instruction to the children in D.C. schools. To ensure that the 108 school gardens and the 50-plus school garden coordinators are able to fully maximize the garden as a teaching resource, OSSE partners with **DC GREENS** to provide a sustained professional development and resource support program.

DC Greens provides support and coordination for the OSSE School Garden Program.

"The Healthy Schools Act of 2010 was a game changer. It ended up being a connector for all of us who had been doing school gardens for years."

Sarah Holway Bernardi
DC Greens

EDUCATION OUTSIDE provides San Francisco public schools with full-time outdoor science instructors through its service corps program. The service members receive specialized training, commit to a two-year term, and become key members of their school community. These on-site instructors are seen as essential to facilitating a high level of usage in SFUSD's green schoolyards program.

MAINTENANCE TRAINING

Anyone who has tried to maintain a school garden or outdoor living landscape on a schoolyard knows that success can hinge on the full engagement of the school custodial staff and the facilities maintenance department. There are plenty of stories of grounds workers mowing down native habitat gardens, irrigation systems that don't get fixed, and teachers whose work orders get placed on the bottom of the pile. Green schoolyards take special investment, professional development, and full engagement of those who steward the school facilities. When trees and plants are placed where there was once concrete, the care and maintenance changes drastically, and it's imperative to build a new system of support for maintaining this part of the school.

While this is generally a weakness in the field, there are some who are approaching it systematically. **THE TRUST FOR PUBLIC LAND (TPL)** has developed special training for the maintenance departments and has secured additional funding for the additional hours it takes to maintain the transformed TPL schoolyards. Space to Grow includes the school custodial staff in all aspects of planning, design and implementation, which results in pride and ownership of the playground spaces. One benefit to the school garden coordinator and the outdoor education specialist model discussed above is that this person does take ownership over the spaces and can spend time facilitating and building relationships with the maintenance and custodial staff on behalf of the teachers.

©2016 CHILDREN & NATURE NETWORK

THE FRONTLINE OF THE MOVEMENT:
EXISTING MODELS & PROMISING PRACTICES

DESIGN: *Research-Based Design, Participatory Design and Design for Environmental Impact*

When we think about designing green spaces on school grounds, the real driver is what outcomes we're seeking. All of the benefits of green schoolyards (see page 8) correlate to special design features which enhance and support them. For example, vegetable gardens directly support nutrition education, and when used in conjunction with gardens that support wildlife, you have a rich opportunity for pollinator support, and scientific field investigation opportunities begin to multiply. Linear pathways and trails enhance physical activity not only by children, but also by adult school staff and families. There is research that supports green schoolyard design that allows for high play and learning value for children, and when beginning design processes, it is essential to engage expertise that is steeped in that design research.

There is a growing trend to view the land on schoolyards as not only an asset to the children who attend the school but also as a public land asset for urban greening that serves community purposes beyond recreation. For many years, land restoration design on schoolyards has included a focus on wildlife habitat. Schoolyards are often part of city-wide wildlife corridors or small-scale ecosystems which use the attraction of wildlife such as birds and pollinators as educational and stewardship opportunities. Extending these public values even further is the growing trend in viewing school district public lands as rich sites for implementing green infrastructure for stormwater management. As more and more cities are facing consent decrees from the federal Environmental Protection Agency, we can expect to see city/school partnerships and specific design elements that can be addressed successfully through providing green infrastructure.

The Wilson Elementary "Wilson Wonderground" campaign engaged the school, the parents, and the neighboring community in raising additional funds to support its Spark Park.

The design of most schoolyards is driven less by research and additional public values, and more by communities coming to the table with ideas, assets and expertise. When asphalt or monoculture grass playgrounds go into place, there is little input necessary by the community, which is certainly a missed opportunity for a strong school/community relationship. Green schoolyards need communities every step of the way. To transform a schoolyard into a place that is a community asset, the entire school community must be engaged, including local residents, families, school staff, partnering organizations, funders, and the children and youth themselves.

This participatory design process takes on different forms, with the most common being the committee approach where representatives from diverse stakeholder groups come together to coordinate the effort. **SPARK PARK** in Houston matches each school's committee with an architect who then designs directly to the committee's articulated goals and ideas

©2016 CHILDREN & NATURE NETWORK

THE FRONTLINE OF THE MOVEMENT:
EXISTING MODELS & PROMISING PRACTICES

for what the park should include. Because schools in the Spark program must raise some of the funds, the entire school can become involved through their fundraising campaign efforts.

As **LEARNING LANDSCAPES** transformed schoolyards across Denver, the relationship between design of play environments and children's well-being was central to the implementation of each site. The designs for each of the sites uniquely reflected the community culture, however there were some consistent features such as grass playing fields, age-appropriate play structures, shaded gathering spaces, community gateways, habitat and natural areas, and in some cases vegetable gardens. Research on maximum physical activity and play value drove the designs, which were conceptualized by a school team approach led by a University of Colorado Denver graduate student.

SPACE TO GROW takes a different approach to the school team or committee by engaging what they call the "school community" of relevant stakeholders in separate meetings over the course of several months. Two teams--a planning team and a garden team—coordinate efforts in general. And in a unique approach, each of the following groups are convened twice for a total of ten meetings: students, teachers, school administration, parents, and the neighboring community. These stakeholder groups allow for rich and open discussion about what each of the groups wants to see in the space without the inhibitions that might result from school or community leadership in the room. These discussions are then folded into several rounds of shared design that result in a space in which the entire school community feels they have a stake. An added layer to the design of a Space to Grow site is the green infrastructure benefit that each site provides. Because two-thirds of the funding for these schoolyard transformations comes from water agencies in Chicago, there is extensive attention given to permeability of surfaces and stormwater capture by the newly greened areas.

Space to Grow in Chicago engages the school community in the design of their school grounds.

PHOTO CREDIT *Openlands*

©2016 CHILDREN & NATURE NETWORK

THE FRONTLINE OF THE MOVEMENT:
EXISTING MODELS & PROMISING PRACTICES

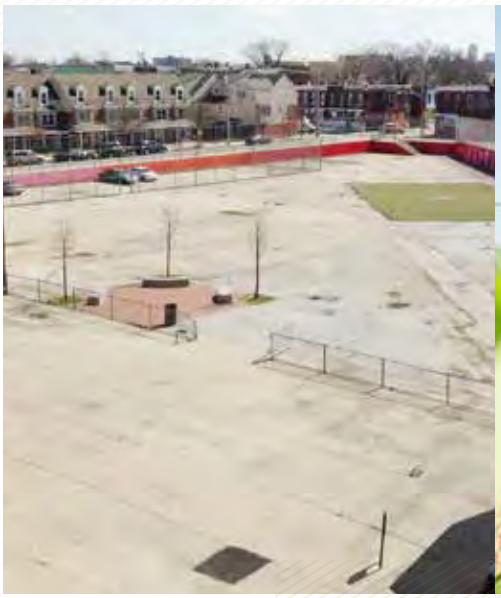


PHOTO CREDIT *The Trust for Public Land archives*

PHOTO CREDIT *Jenna Stamm courtesy of The Trust for Public Land*

Philadelphia Water Department transforms asphalt school grounds into rich natural environments by implementing green infrastructure on schoolyards to manage stormwater and engage children in learning.

Both **THE TRUST FOR PUBLIC LAND** and the **PHILADELPHIA WATER DEPARTMENT** have focused on green infrastructure as the driving force behind playground transformation for the community. Asphalt playgrounds are turned into nature-rich environments that advance the city's goals to manage its excess stormwater while also reaping the other benefits to the school and community such as enhanced opportunities for environmental education and beneficial natural play environments for children and families.

COMMUNITY ENGAGEMENT: *Out-of-School-Time Access, After-School Programming, Community Use & Participation*

For many years we have largely focused on green schoolyards as outdoor classrooms to be used for core instruction during the school day. The benefit of these spaces to the community goes well beyond the outreach model to have community engagement in maintaining and sustaining the physical spaces. When we seek to make a rich community space that reaches children in low-income communities, schools serve as that hub for family connections and neighborhood engagement in children's lives. There is a growing trend in creating additional green space in communities by co-locating parks and schools, often considered "shared use" or "joint use" of public lands. Community place-making has gained the mainstream attention of urban planners, community health advocates, and others interested in the well-being of children. Green schoolyards provide opportunities to increase support of community gardens and community parks as places where multiple generations can enjoy recreational activities and relax as they connect with one another.

©2016 CHILDREN & NATURE NETWORK

THE FRONTLINE OF THE MOVEMENT:
EXISTING MODELS & PROMISING PRACTICES

Multiple generations use green schoolyards after school hours, benefitting both mental and physical health.

Community shared use can take many forms, as is outlined in the **SAFE ROUTES TO SCHOOLS** Shared Use Spectrum (see shareduse.saferoutespartnership.org/resources/spectrum-shared-use-0). It can range from informal agreements to formal joint-use memoranda of understanding or state or municipal policy. Regardless of the level of formality of the agreement or policy, the co-benefit to schools and the community exists when children learn and play in nature-rich environments during the school day, and the community is able to access this same rich environment for additional purposes outside the school day.

As part of existing green schoolyard work, **SPACE TO GROW**, **LEARNING LANDSCAPES**, **THE TRUST FOR PUBLIC LAND**, and **SPARK PARK** all require community access to the playground transformation projects that they undertake. This public access is meant to provide much-needed green space in priority communities where green space is sparse and where health risks are often high. The challenges involved in not just implementing but maintaining a public park on the school ground must be addressed clearly in the formal agreements that are made, and each school and program addresses this somewhat differently.

Green schoolyards provide rich opportunities for after school programming well beyond what traditional recreational spaces can offer. Biodiversity and diverse play areas on a school ground are shown to engage children in different types of play, which provide opportunity for more engaged free play. Learning opportunities that can be programmed into after school and even summer programming can augment school-day learning with additional outdoor exploration and investigation. There are very few curricula that directly address after school programming, but from all of the resources that exist for garden-based education and environmental education, the potential is there to amplify this opportunity.

PHOTO CREDIT *Metropolitan Water Reclamation District of Greater Chicago*

©2016 CHILDREN & NATURE NETWORK

A FRAMEWORK FOR ACTION: **RECOMMENDATIONS FOR BUILDING A NATIONAL GREEN SCHOOLYARDS MOVEMENT**

If we stand by our premise that all children deserve to have a green schoolyard in which to play and learn, then we have a long way to go to make that a reality. The participants in Children & Nature Network's interviews, focus groups, and convenings articulated a wide array of ideas about how to move toward wider replication and scale of green schoolyards. We are offering here a highly condensed set of recommendations with the hope that it will spark further national coordinated planning and action in the weeks, months, and years to come.

DESIGN A NATIONAL GREEN SCHOOLYARDS NETWORK

FUEL POLICY, PARTNERSHIPS & FUNDING STRATEGIES

GENERATE RESEARCH & METRICS TO INCREASE THE EVIDENCE BASE

LAUNCH A COMMUNICATIONS CAMPAIGN

REPLICATE STRONG MODELS OF GREEN SCHOOLYARDS

©2016 CHILDREN & NATURE NETWORK

DESIGN A NATIONAL GREEN SCHOOLYARDS NETWORK

In an initial investigation of active players in the green schoolyard movement, we determined that there are over 150 green schoolyard support organizations, thousands of individual schools implementing to various degrees, and a few organized networks. And yet, only a fraction of schools in the U.S. have these quality environments. Existing green schoolyard networks are coordinating efforts locally, statewide, nationally and internationally, such as the Hawaii Islands School Garden Network, the National School Garden Network, and the International School Grounds Alliance. These organizations, schools, and networks tend to have different focus areas, such as "school gardens" or "nature play" or "green schools," making for a fragmented field that is not mutually aligned. There are countless additional relevant organizations across sectors that are not yet directly engaged, and in order to bring green schoolyard to scale, it will be important to align these multiple organizations, networks, and new stakeholders to focus the national strategy. To achieve this, stakeholders in the field have recommended the two following activities:

1. **Building a National Green Schoolyards Strategy Team which would consist of leaders who bring diverse expertise from many relevant professional fields.** The national strategy team will initially guide the work by writing a National Green Schoolyard Declaration which will articulate the shared vision, values, goals and desired outcomes.

2. **Employing the latest research and practice on network design to connect and propel action among the cross-sector stakeholders who can move this work into the mainstream.** This network approach goes beyond the model of collective impact with a backbone organization and aligned partners. It demands that there be intentionally designed complex sets of connections and actions among the many stakeholders who will expand the scope of the work.

FUEL POLICY, PARTNERSHIPS & FUNDING STRATEGIES

A coordinated national green schoolyard effort will require alignment and prioritization in achieving policy change. To build pathways for engaging in the required political processes, the National Green Schoolyards Strategy Team (and network members with policy expertise) will build a Policy Agenda and a strategy for policy advocacy. Policy case-making resources will come out of the research and communications efforts to fuel grassroots change.

The multiple benefits of green schoolyards provide us a wealth of potential options for both partnership and funder development to build up the shared social return on any investment. Nature-rich outdoor play and learning environments on school grounds are not currently the norm, and the most common argument by decision-makers against green schoolyards is the lack of funding. The National Green Schoolyards Strategy Team will need to align leaders across sectors with common strategy and language. We will benefit from collectively increasing opportunities for organizations across sectors to band together to jointly apply for coordinated funding.

©2016 CHILDREN & NATURE NETWORK

GENERATE RESEARCH & METRICS TO INCREASE THE EVIDENCE BASE

One of the goals of the National Green Schoolyards Network will be to advance research on the science of the benefits, outcomes and best practices in implementing green schoolyards. There are two particular areas that would allow the evidence base to be significantly increased:

1. **Establishing a solid research agenda to advance our understanding of the field.** This agenda will identify how community-based green schoolyards affect a variety of outcomes, such as physical and mental health, family engagement, academic performance, and ecosystem health. Researchers will identify gaps in knowledge about green schoolyards and formulate a long-term interdisciplinary agenda appropriate for sustained collaborative research.

2. **Creating Shared Metrics to Measure Impact of Collective Efforts.** Currently there is a significant lack of measurement of green schoolyard prevalence or practices. In order to advocate for additional dollars or policy change to support this emerging field, we must initiate a concerted effort nationally to address this gap in the evidence base. Baseline data must be established, systems for mapping progress and impact must be created, and program practices must be measured in order to inform new implementations. As research tools are developed, the data collection could be somewhat standardized while also maintaining the ability to address the wide variety of schoolyard implementation models, from a few raised-bed vegetable gardens to multi-million-dollar community green space transformations.

LAUNCH A COMMUNICATIONS CAMPAIGN

The green schoolyard work in the field is diverse and has a wide variety of messages about benefits and best practices. School garden groups often talk about nutrition education and academic benefits; nature play groups communicate the physical activity and social-emotional benefits of diverse play; green infrastructure groups talk about ecosystem services and community place-making benefits. All of this is true and good, but the multiple messages make for a difficult pathway forward as we seek to communicate to new partners, funders, and decision-makers. We must find a way to simplify the message and then propel it out into the mainstream with a strong marketing and communications campaign. This campaign has to deliver a powerful message to the community decision-makers that shows not only the multiple benefits, but the urgency around the need, especially for children. We can galvanize grassroots efforts with this campaign by activating parents, teachers, school administrators, community advocates, mayors, policy-makers, local and state agencies, and new partners and funders.

The communications campaign must be backed up with resources and tools that can translate the message to action in communities. Leaders in the field have distilled decades of lessons learned and specific expertise into a wide collection of resources. However, those resources exist in disparate pockets that would not be apparent to any newcomer to the field. To support the new stakeholders and communities brought into the work through the communications campaign, a resource hub is necessary. An organized online framework populated by resources and links to further information will support all levels of engagement–from the newcomer to the field who might be exhibiting curiosity about what is involved to those deep in implementation who need additional information and support.

©2016 CHILDREN & NATURE NETWORK

REPLICATE STRONG MODELS OF GREEN SCHOOLYARDS

There are strong models for green schoolyards across the country, and while each has arisen out of a local ecosystem of funding, partnership, and policy support, there is a tremendous amount we can transfer to new communities who have built up initial awareness and capacity. As new communities and schools express interest in greening their school grounds, we need to provide tools for the local leadership to look carefully at the existing programs, identify the program components that fit their strengths and desired outcomes, and then provide resources and technical assistance to enable new communities to implement these models. In many cases, it might simply mean placing community leaders in touch with existing organizations for additional training and support. In other cases, it might mean consultants working closely with a target community to build the foundation of partnerships and funding to support the replication of a given model.

And for many communities, there is limited capacity to do the long-term planning and implementation of a uniquely crafted green schoolyard implementation. If we are going to truly reach scale and meet the growing demand, we must find a way to package up what there is to know about planning, creating and maintaining green schoolyards to make it relatively easy. Green schoolyards are, by their very nature, unique to each community's strengths, assets and desires, making each project resource-intensive. And yet, the imprint of communities who have any form of a green schoolyard is far too small. As a field, we have to acknowledge that we have an urgent need to achieve a much broader scale at a much quicker pace than is currently being enacted. Therefore, as part of the replication and scale we are seeking to achieve, we must be open to finding new business models for igniting widespread implementation that makes it easy, affordable, and sustainable in the community.

©2016 CHILDREN & NATURE NETWORK

children & nature NETWORK

green schoolyards FOR HEALTHY COMMUNITIES

This guide was principally written by Margaret Lamar, the Director of Strategic Initiatives for the Children & Nature Network, with additional contributions from Cathy Jordan, PhD, LP, C&NN Consulting Research Director and Associate Professor of Pediatrics and Extension, University of Minnesota.

Development of Green Schoolyard infographics on pages 9-12 was directed by Consulting Research Director Cathy Jordan with support from Research Library Curator, Ruth Wilson, PhD. Graphic design and consulting services were provided by Fourth Sector Consulting. The C&NN Scientific Advisory Council provided critical review of infographic statements and statistics, and the literature cited in support of those statements and statistics. Members of the C&NN Scientific Advisory Council include:

Nicole Ardoin, PhD, *Associate Professor, Graduate School of Education and the Woods Institute for the Environment, Stanford University*

Louise Chawla, PhD, Professor, *College of Architecture and Planning, University of Colorado*

Howie Frumkin, MD, MPH, DrPH, *Dean and Professor of Environmental and Occupational Health Sciences, University of Washington School of Public Health*

Marianne Krasny, PhD, *Professor and Director, Civic Ecology Lab, Department of Natural Resources, Cornell University*

Stephen Pont, MD, MPH, FAAP, *founding medical director, Texas Center for the Prevention and Treatment of Childhood Obesity and medical director, Austin Independent School District Student Health Services*

Nancy Wells, PhD, *Professor, Department of Design and Environmental Analysis, College of Human Ecology, Cornell University*

We would like to express special appreciation to the staff at The Children & Nature Network for shaping the thinking of the theory of change and all of the movement-building strategies presented here. Special thanks to those who provided direct support, Linda Madson, Mollie Thompson, Sarah Milligan-Toffler, Laura Mylan, and Amy Pertschuk.

ABOUT THE CHILDREN & NATURE NETWORK

The Children & Nature Network (C&NN) is leading a movement to connect all children, their families and communities to nature through innovative ideas, evidence-based resources and tools, broad-based collaboration and support of grassroots leadership. C&NN is the only organization focused solely on building a national and international movement that reconnects children with nature to optimize their healthy development—cognitively, emotionally, socially and physically. C&NN builds awareness, provides access to state-of-the art resources, supports the grassroots with tools and strategies, develops publications and educational materials, synthesizes the best available research, and encourages collaboration to infuse the connection of children to nature in policy, programs, and partnerships across the world. C&NN is a 501c3 non-profit organization.

The Children & Nature Network gratefully acknowledges funding from the W.K. Kellogg Foundation in support of this project and this document.

W.K. KELLOGG FOUNDATION®

The W .K. Kellogg Foundation is based in Battle Creek, Mich., and works throughout the United States and internationally, as well as with sovereign tribes. Special emphasis is paid to priority places where there are high concentrations of poverty and where children face significant barriers to success. For more information, visit www.wkkf.org

FOR MORE INFORMATION

Visit childrenandnature.org or childrenandnature.org/schoolyards
or contact Margaret Lamar, Director of Strategic Initiatives, Children & Nature Network
margaret@childrenandnature.org