October 4, 2024

ECONOMIC BENEFITS OF GREEN SCHOOLYARDS

Presented by:

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Photo: Christian Phillips (BSI)

What is a Green Schoolyard?

A green schoolyard is a nature-filled, multi-functional school ground designed for and by students, teachers, parents and community members that offer spaces to play, learn, explore and grow. During out-of-school time, green schoolyards are open for community use, increasing access to nearby parks and improving the health and wellbeing of surrounding communities.

They can include:

- outdoor classrooms
- native and pollinator gardens
- stormwater capture
- traditional play equipment
- nature play areas
- edible gardens
- trails
- trees, etc.

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GREEN SCHOOLYARD CONVERSIONS

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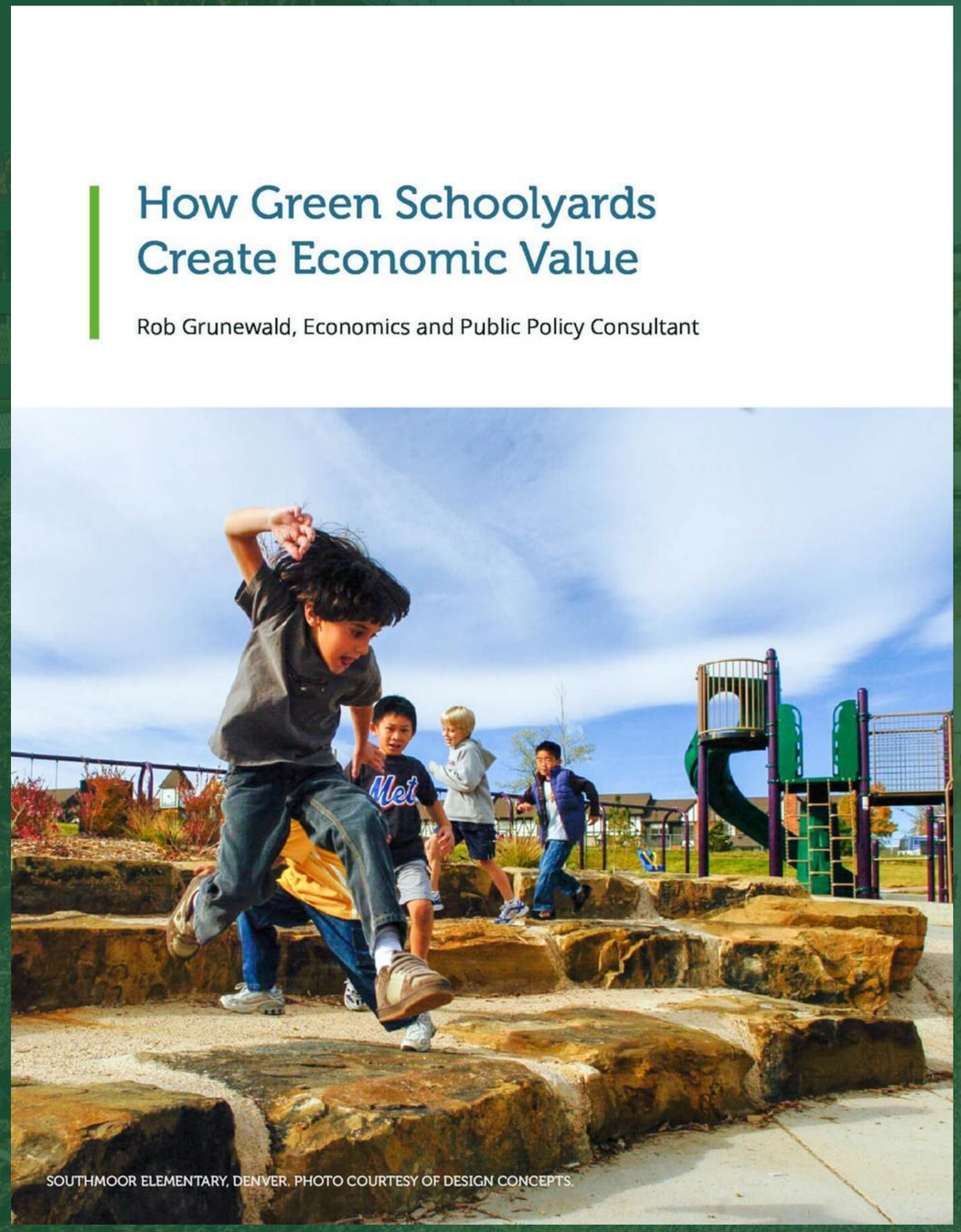

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Key Takeaways

Gains across different domains:

01

Children’s learning and health

Environmental sustainability

02

03

Community development and health

Key Takeaways

Economic research: Solid circumstantial case that value is larger than costs.

Paved schoolyards are concentrated in low-income and racially and ethnically diverse neighborhoods: GSYs help close opportunity gaps.

Benefits accrue not only to **school children**, but **society** as a whole.

- Condition generally leads to underinvestment.

Since benefits span several sectors, mechanisms that facilitate cross-sector collaboration and financing could help move green schoolyard projects forward.

RESEARCH LIBRARY

We curate and summarize peer-reviewed scientific literature that makes the case for connecting children with nature. Curation of research is guided by our Scientific Advisory Council, a multi-disciplinary team of experts who bring diverse perspectives to our work. You can search our library below.

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USER'S GUIDE: Tips and a Glossary of Search Terms

KEYWORDS | AUTHOR | START YEAR | END YEAR

Search exact keyword string | Include ANY rather than ALL of the above keywords

FILTER BY

Population 0 | Methods 0 | Outcomes 0 | Barriers 0 | Themes 0

START SEARCH

DENVER STUDY

From 2000 to 2012, Denver Public Schools converted 99 elementary schoolyards encompassing 306 acres to ‘Learning Landscapes’.

- Compares school-level trends prior to implementation with trends post-implementation against data from unconverted schools over same period.
- First to analyze data from a districtwide green schoolyard conversion project in a large urban district to estimate many different types of effects.

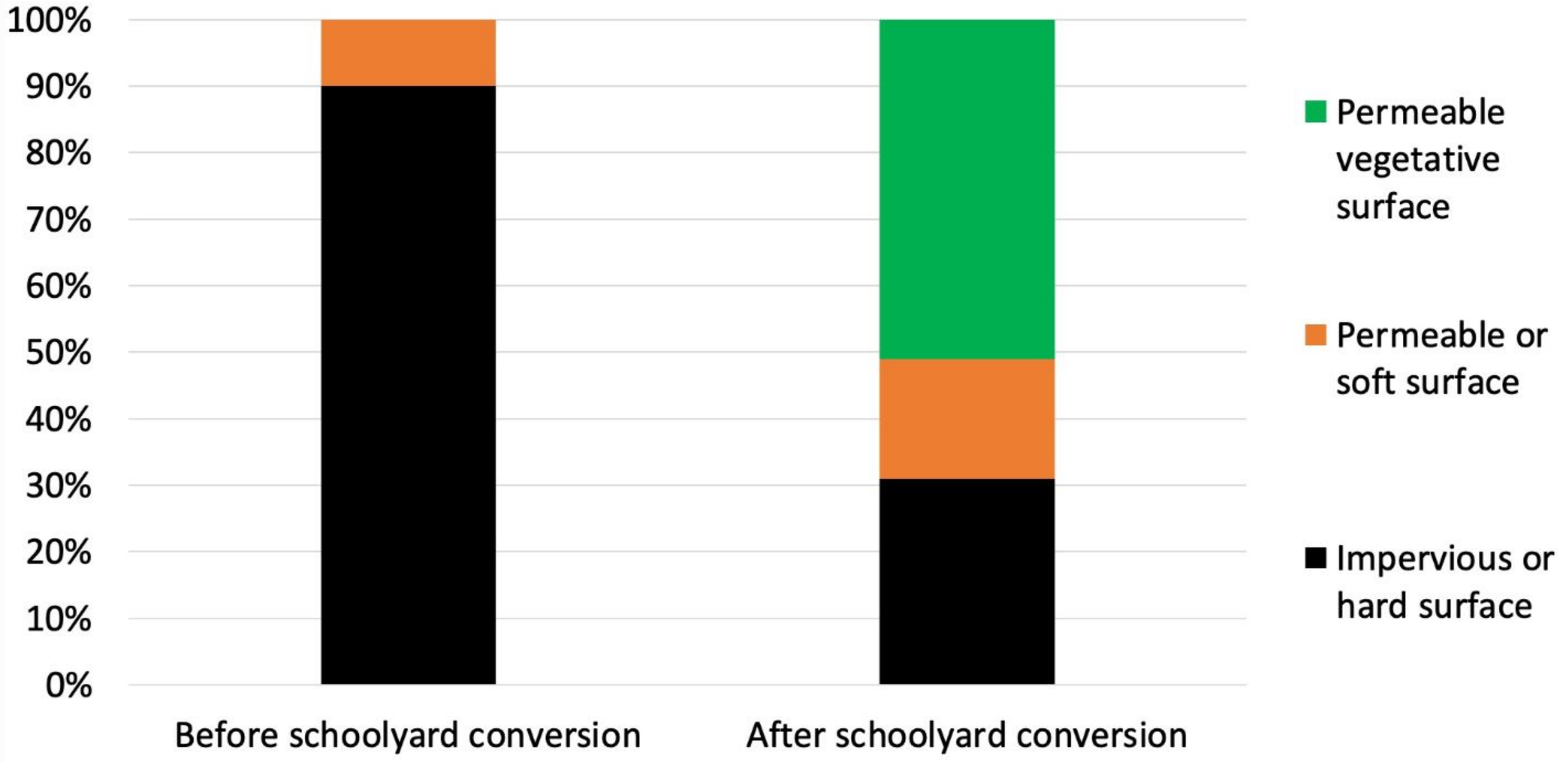
Average Cost of Schoolyard

$630,012

Autocase
Economic Advisory

BIG SANDBOX
building healthy neighborhoods

Composition of average Denver elementary schoolyard surfaces before and after Learning Landscapes conversions



Children’s Learning

Children more active on GSYs + exposure to nature = stress reduction, attention restoration, cooperative behaviors

Denver Study Results:

School mobility rate decreased 7%pt.

increase in school-level student performance framework

Small decrease in truancy rate

8.5%pt. higher math growth and 5.4%pt. higher reading growth than schools in border districts

Hypothetical Scenario

- Change trajectory of one high school dropout to a high school graduate every 5 years over 40-year period:

$340K

Public Benefits

$900K

Private Benefits

Children’s Health

- Increased physical activity good for health
  - **Finland study**: Correlations between physical activity in childhood and physical activity in adulthood
- **Denver study:** Green schoolyards led to school vegetable gardens and salad bars in school cafeterias

Return on Investment for School Districts

Increased enrollment (152 students) and state education funding ($1,342,000)

Improved working conditions for teachers

Attract support for bond measures that also fund deferred capital projects and education needs


Photo: Design Concepts

Environmental Sustainability

Net present value over 40 years

15° reduction in air temperature: $3,312

- Schools without air conditioning: 1 degree Fahrenheit warmer school year reduces that year's learning by 1 percent.

- Studies in U.S. and Canada: Exposure to extreme heat events during 1st trimester of pregnancy associated with higher incidences of congenital heart defects.

Environmental Sustainability (cont.)

Net present value over 40 years

13 tons of carbon sequestered annually = $26,875

- Comparable to 10 gasoline-powered vehicles driven and 6 homes' energy use for one year
- Based on $30 per metric tons of carbon dioxide

4 lbs of air pollutants removed annually = $67,833

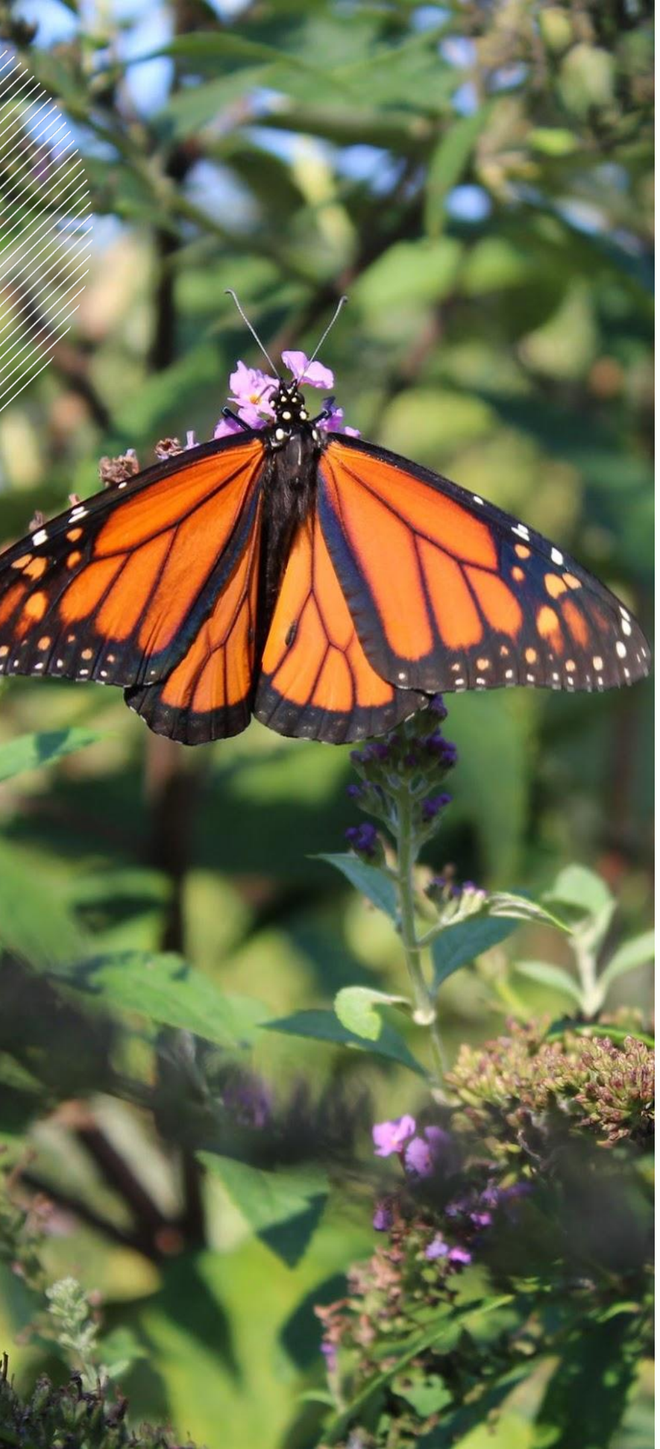
Based on reducing serious health effects, particularly respiratory ailments that may include chest pain, coughing, asthma aggravation, and even premature death

Environmental Sustainability (cont.)

Net present value over 40 years

Reduced gallons of rain runoff. Average annual rainfall in Denver: 14 in.

241,000 gallons = $49,720



Environmental Sustainability (cont.)

Increase pollinator habitat

University of Pittsburgh and Penn State University researchers estimate the economic value of insect pollinators at $43 billion in the U.S.

Initial evidence that small interventions can benefit pollinators.

Increase children’s long-term sustainability behaviors

Children’s connectedness to nature has a positive relationship with sustainable behaviors

Community Development

Net present value over 40 years

$242,127

Increase in property taxes due to property values:

- Based on Trust for Public Land method: Estimate property values increase by 5% when located within 500 ft. of a park
- Increased demand for rental housing near green schoolyards can push rental prices higher.
- Community engagement and community land trusts can help mitigate gentrification

Boost community cohesion and public safety

Community Health

- Improve community and mental health

Hypothetical scenario:

Over 40-year period boost or maintain the physical activity of 10 adults aged 18-64 and 2 adults age 65+ to CDC recommended levels annually: $462,434.

Average of 2,523 people aged 18-64 and 525 people over age 64 live within a 10-minute walk of a Denver green schoolyard.

Benefit-Cost Ratios

- Statistical estimates of environmental sustainability outcomes and local property tax revenue increases

$0.60 | $1

- Add modest gain in either high school graduation rate or improvements in community health

$1 | $1

- Add modest gains in both high school graduation rate and improvements in community health

$3 | $1

FUTURE RESEARCH

Link school- or student-level data to changes in elementary school student achievement scores that are predictive of high school graduation rates.

Community development and health effects of green schoolyards: Analyze pre- and post-conversion data on nearby property values, community use of green schoolyards, and community health.

Cross-sector Collaborations

School districts

Community development

Nonprofits

Health care

Philanthropy

Counties

Cities

Park and recreation agencies

Affordable housing

Cross-sector Financing

General revenue

Businesses

Grants

Bonds

Referendums

Philanthropy

Affordable housing

Banks

School districts

Counties

Cities

States

Federal

Key Takeaways

Economic research: Solid circumstantial case that value is larger than costs.

Paved schoolyards are concentrated in low-income and racially and ethnically diverse neighborhoods: GSYs help close opportunity gaps.

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