



**Better
Buildings®**
U.S. DEPARTMENT OF ENERGY

K-12 Breakout Session

Monday, May 9th from 2:00 - 5:00 PM
Room: Oak Lawn

Agenda

- **2:00**
 - Welcome, Introductions, Program Overview
- **2:15**
 - PART 1: Advancing K-12 Energy Efficiency Strategies
- **3:30**
 - Break
- **3:45**
 - PART 2: K-12 School District Peer Exchange
- **5:00**
 - Adjourn

Program Overview

Program Snapshot

Better Buildings Challenge Snapshot, 2015

Partnership	
Number of Partners and Allies	310+
Square Feet Represented	4.2 billion
New Partners in the past year	60+
Solutions	
Partner Solutions Available for Replication	400+
Results	
Energy Saved (Btus)	161 trillion
Dollars Saved	\$1.3 billion
Avoided CO ₂ emissions (tons)	10.1 million
Funding Committed/Placed	\$5.5 billion / \$5.4 billion
Water Savings (gallons)	2.1 billion

K-12 Snapshot

20 partners

80 million square feet

400+ buildings

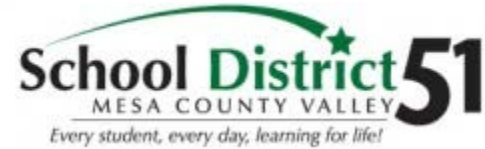
10 Showcase Projects

3 Implementation Models

K-12 BBC Partners



Evergreen Public Schools



CAMAS SCHOOL DISTRICT
A TRADITION OF CARING AND QUALITY



HUNTSVILLE CITY SCHOOLS
Where Young Futures Take Flight



General Program Updates

- BBC 2016 Progress Report
 - [Link](#)
- New BBC Implementation Models
 - [Douglas County School District - A Lesson Plan in Financing K-12 Energy Efficiency](#)
 - [Portland Public School District - Hybrid Funding Approach](#)
 - [Camas School District - Energy Resource Management Program](#)
- BBC SWAP
 - [Whole Foods Market and Hilton Worldwide](#)

New Webpage!



PARTNERSHIPS ▾

CONTENT ▾

TERMS ▾

MANAGE ▾

MY ACCOUNT

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Sector: K-12 School Districts



Energy is an expense schools can reduce to free up educational resources. Energy efficiency offers the potential to redirect significant savings back to educating students, as K-12 schools and higher education institutions respectively spend \$8 billion and \$6.5 billion annually on energy. Energy-efficient schools establish a safe, healthy, and productive environment for learning, offering a unique opportunity to serve as a living laboratory for students to understand and benefit from new technologies first-hand.

[Visit our Beat Blog](#)

[Better Buildings Challenge SWAP](#)

[Better Buildings Summit](#)

Summit Sessions of Interest

- Overcoming Barriers: Deploying High Efficiency Outdoor Lighting
- Workshop - Part 1: Energy Efficiency Finance
- Workshop - Part 2: Energy Efficiency Finance
- Evaluation, Measurement and Verification of Energy Efficiency Programs
- Mobilizing Benchmarking Data to Create New Outcomes
- Building the Infrastructure for Energy Savings Performance Contracting
- Are You Forgetting About Your Rooftop Units? Efficiency for Packaged HVAC

TONIGHT! Sector Networking Event

Monday, May 9th at 5:30pm

The Front Page

1333 New Hampshire Ave NW
Washington, DC 20036

PART 1: Advancing K-12 Energy Efficiency Strategies

Presenters

- Crystal McDonald (DOE) – Moderator
- Rois Langner (NREL) – Plug Loads
- Abdul Majid (Anne Arundel County Public Schools) – Workforce Retention
- Jensen Adams (Kansas City Public Schools) – ESPCs
- Cody Taylor (DOE) – ZEB for Schools

Rois Langner

- Rois Langner is an architectural engineer and building scientist in the Commercial Buildings Research Group at the National Renewable Energy Laboratory (NREL), located in Golden, Colorado.
- Rois has worked at NREL since 2010 on various research projects focused on energy efficiency in commercial buildings, utilizing OpenStudio software to analyze and optimize building design and performance.
- More recently, she has supported the U.S. Department of Energy's Better Buildings Alliance leading the Plug and Process Load technical solutions team, and also leads efforts to support the small commercial building sector in overcoming barriers that inhibit the adoption of energy efficiency solutions.

Abdul Majid

- **Education:**

- Masters in Mechanical Engineering from University of Maryland, College Park

- **Member:**

- ASME (Association of Mechanical Engineers)

- **Certification:**

- EEP (Energy Efficiency Professional)

- **Work Experience:**

- State of Maryland, DHMH, Sr. Mechanical Engineer, 1986-2006
- Anne Arundel County Public Schools, Utility Systems Program Manager, 2006-2016

Jensen Adams

- Energy & Sustainability Manager, Kansas City Public Schools
- Appointed by Kansas City Mayor to serve on Environmental Management Commission
- Served on Advisory Committee to City Manager for NRDC and IMT's City Energy Project with Kansas City
- University of Missouri Extension Council
- Worked for decade as program implementer for efficiency programs with utilities and governments
- Ongoing graduate studies at University of Missouri-Kansas City for Executive Master of Public Administration

Cody Taylor

- Cody Taylor is a Team Lead for Commercial Building Integration in DOE's Building Technology Office.
- He leads the Commercial Market Transformation portfolio, helping markets to more effectively deliver energy efficiency.

PART 2: K-12 School District Peer Exchange

Sector Priorities - Financing

- Tools
 - [Financing Energy Upgrades for K-12 School Districts](#)
 - [Better Buildings Financing Market Solutions Team](#)
 - [Better Buildings Financial Allies](#)
 - Financing Navigator – coming soon
- Best Practices
 - [Douglas County School District - Financing K-12 Energy Efficiency](#)
 - [Portland Public School District - Hybrid Funding Approach](#)
 - [Douglas County School District - Gardnerville Elementary School Modernization](#)
 - Alachua County Public Schools is leasing rooftop space (revenue for school district) for solar PV (funded by investors) to generate power that is sold back to the utility



Sector Priorities— Data Management

■ Tools

- [Better Buildings Data Access Market Solutions Team](#)
- [Energy Data Collection and Tracking Webinar](#)
- [Benchmarking Data Cleansing Webinar](#)



Sector Priorities - Public Engagement

- Tools
- Best Practices
 - [Poudre School District - Strategic Communications and Outreach Campaign](#)



Sector Priorities - Facilities Planning/O&M

- Tools
 - Smart Energy Analytics Campaign – coming soon
- Best Practices
 - [Evergreen Public Schools - Mill Plain Elementary School HVAC Upgrade Project](#)



Sector Priorities - Resource Conservation Policies/Programs

- Tools
 - [Education Initiatives](#)
- Best Practices
 - [Camas School District - Energy Resource Management Program](#)



Sector Priorities - Workforce Training

- Tools
 - [Better Buildings Workforce Guidelines](#)
 - [Buildings Re-tuning Training](#)
- Best Practices



Sector Priorities - Student Learning and Healthy Environments

- Tools
- Best Practices
 - [Houston Independent School District - Farias Early Childhood Center Retrocommissioning](#)
 - [Indian River Central School District - Indian River Middle School](#)
 - [Camas School District - J.D. Zellerbach Administration Headquarters](#)
 - [Dysart Unified School District - Kingswood Elementary School](#)



STATE OF OUR SCHOOLS

AMERICA'S K-12 FACILITIES



WHY THIS REPORT, AND WHY NOW?

Public school facilities data,
information and analysis is lacking

Few facilities standards exist to guide
communities and school leaders

Responsibilities are mounting for this
generation of children and the next

WHERE WE LEARN MATTERS.



50 million students
6 million adults

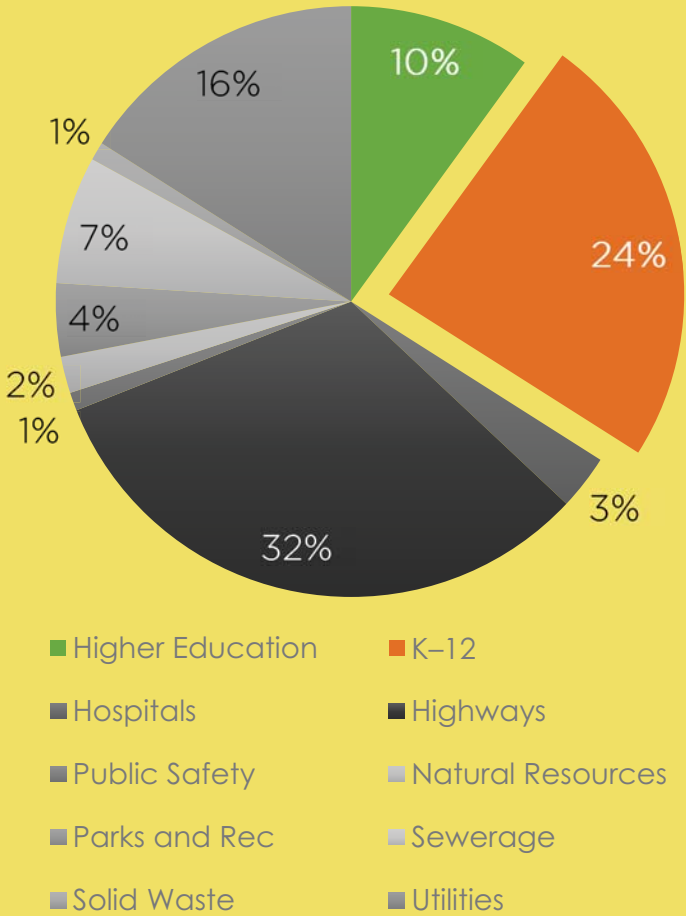


100,000 buildings



7.5 billion GSF
2 million acres

Percent of total state and local capital outlay, 1995-2012



K-12 FACILITIES ACCOUNT FOR NEARLY **ONE-FOURTH** OF STATE AND LOCAL INFRASTRUCTURE INVESTMENTS



WHAT'S AT STAKE?



Improved student achievement
Reduced truancy, suspensions
Better health
Improved staff satisfaction, retention
Higher property values

THREE KEY QUESTIONS

1. Do states and districts have **adequate operating funds** for cleaning, maintenance, and repairs to ensure buildings and grounds are healthy and safe?
2. Are districts and states investing the **capital funds** necessary to ensure that their public schools are educationally appropriate, energy efficient, and environmentally responsible?
3. Are states and the federal government doing enough to **ensure equity** in education, so that all students have access to healthy and safe school facilities that support learning?

DATA & METHODOLOGY

U.S. Census of Governments
and National Center for
Education Statistics



Fiscal data reported by
school districts
(FY 1994-2013)

State officials



Building inventory &
state capital funding
for school facilities

Dodge Data & Analytics



Hard costs of public
school construction

1994-2013

A GENERATION OF FACILITIES CHANGE

- 4.8 million students added
- 13,000 schools added
- New health and safety standards
- Increased environmental responsibility
- Smaller class sizes, more labs
- Serving special needs students
- Expanded early education
- More technology
- Increased safety and security
- Grounds as a community asset

20 YEARS OF FACILITIES
SPENDING & INVESTMENT
ANNUAL AVERAGE

\$99 BILLION

CAPITAL
CONSTRUCTION
PER YEAR (1994-2013)

\$49 BILLION

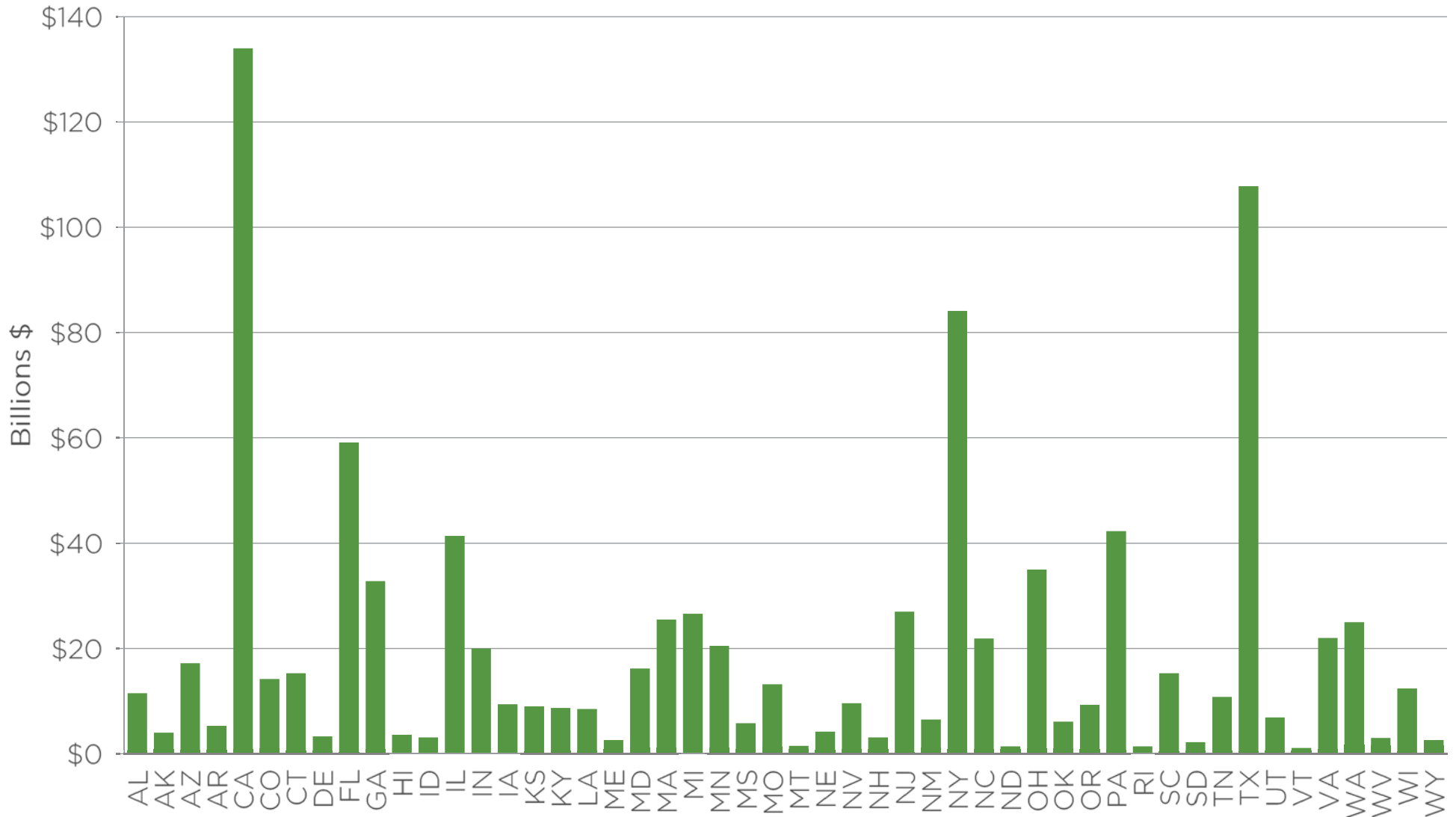
MAINTENANCE
& OPERATIONS
PER YEAR (2011-2013)

\$50 BILLION



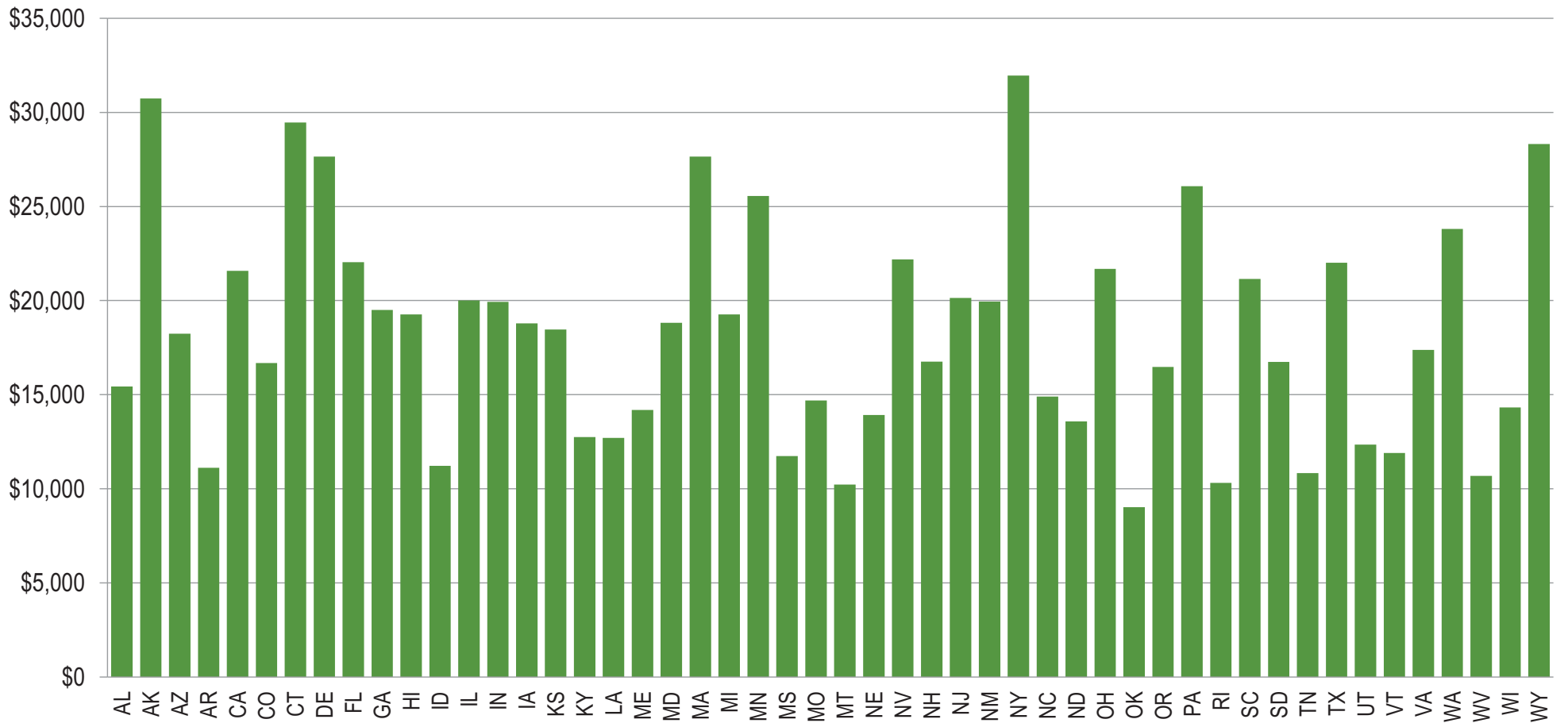
CAPITAL CONSTRUCTION: \$973 BILLION

TOTAL CAPITAL SPENDING, 1994-2013 (2014\$)



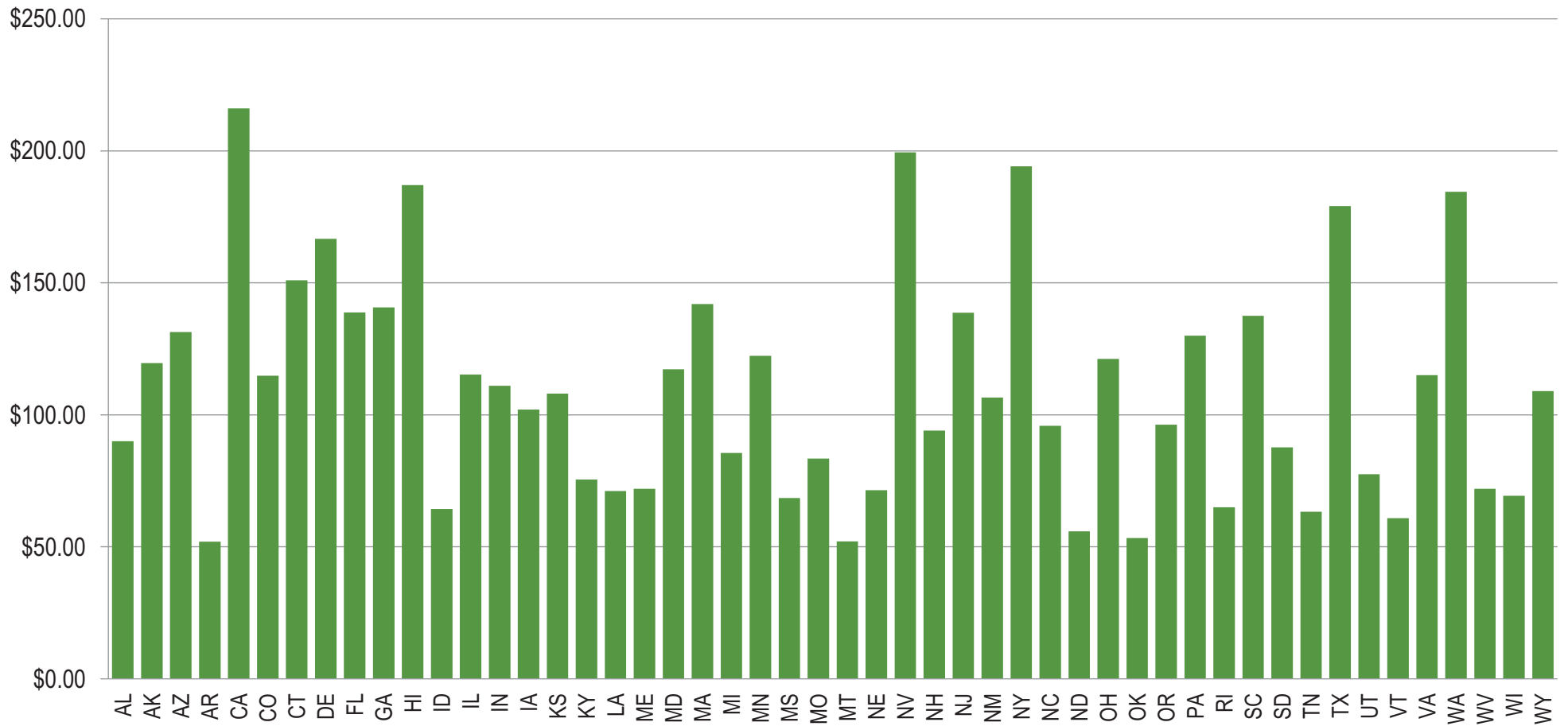
CAPITAL CONSTRUCTION SPEND PER STUDENT

Total FY1994-2013 (in 2014\$)



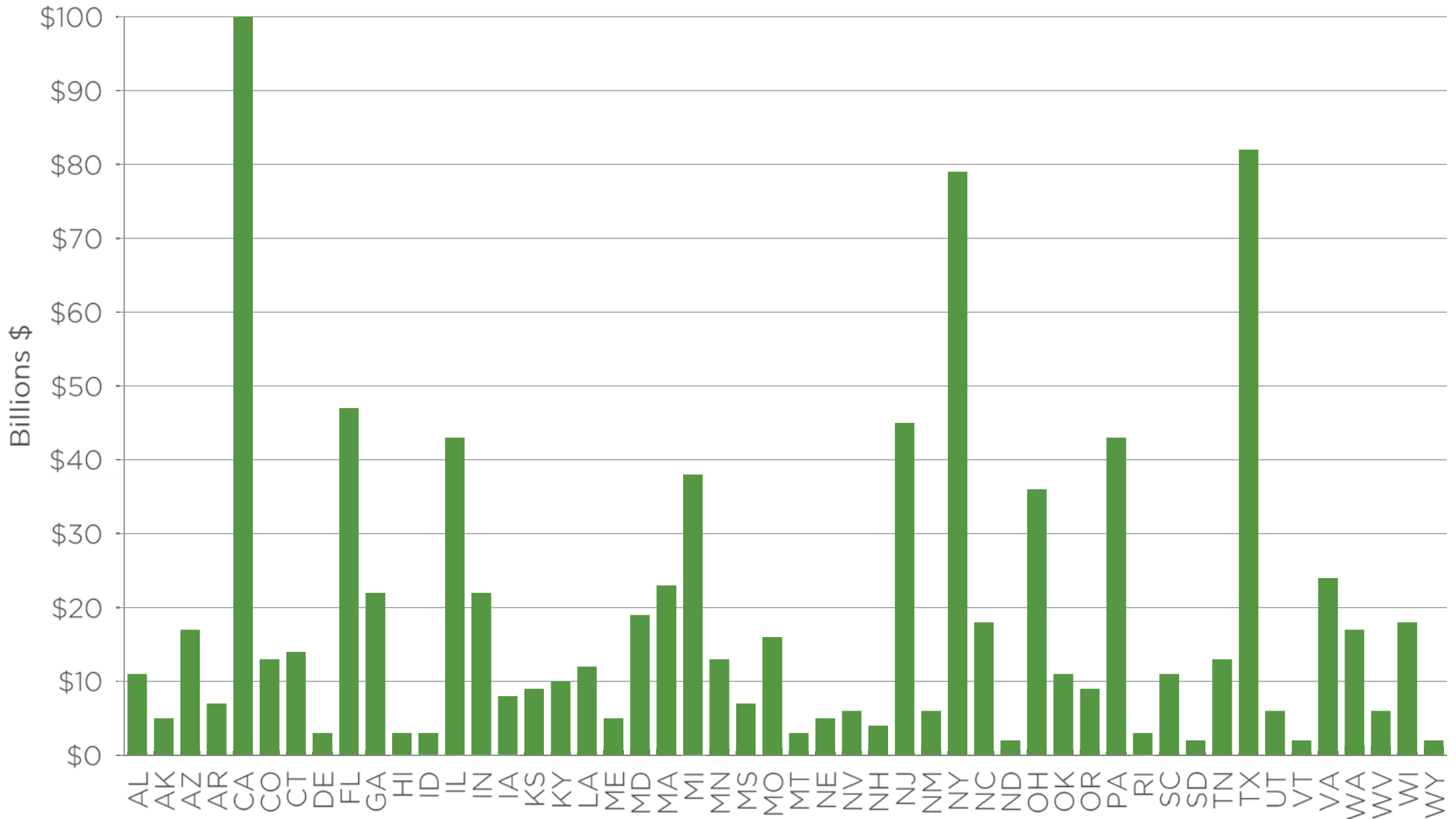
CAPITAL CONSTRUCTION SPEND PER GSF

Total FY1994-2013 (in 2014\$)



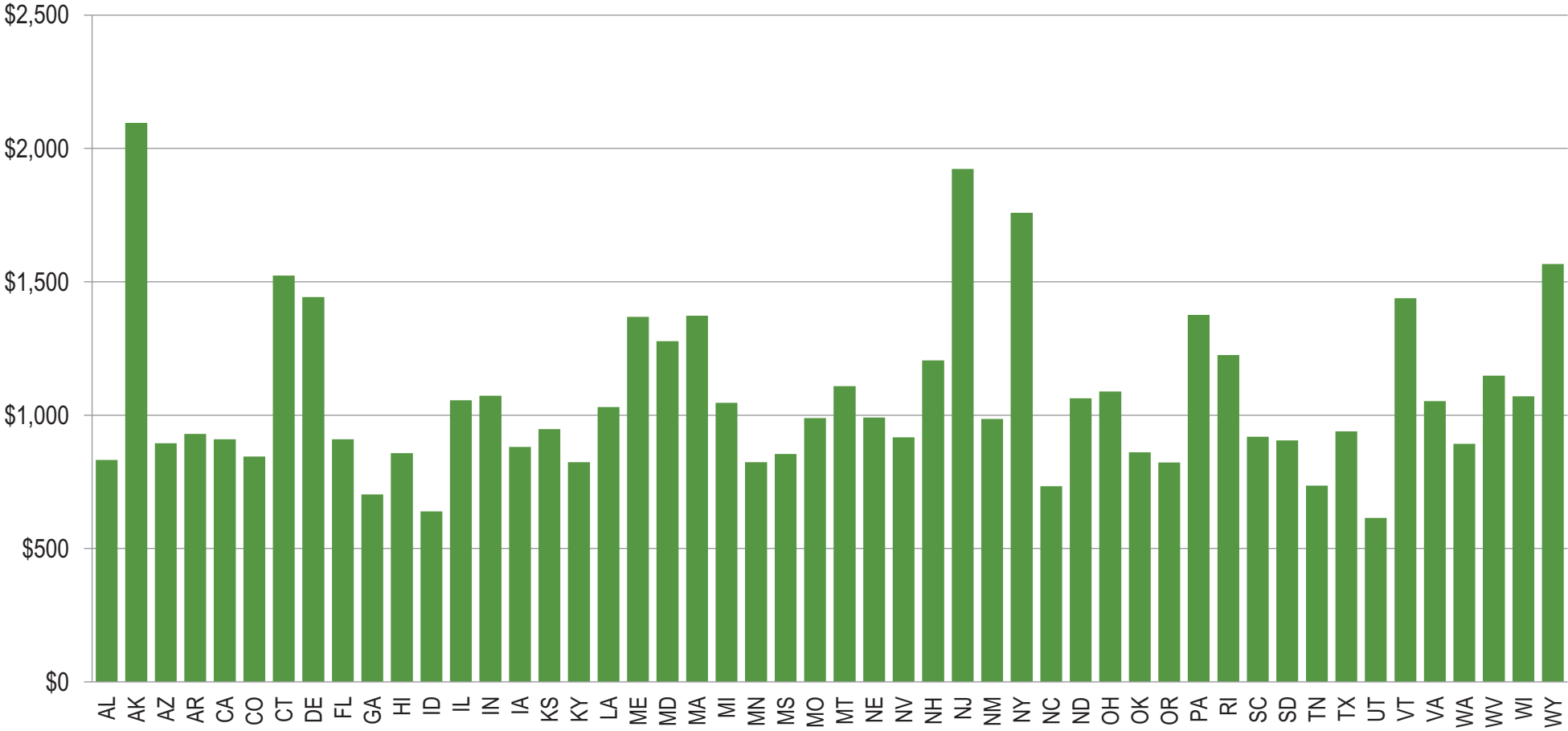
MAINTENANCE & OPERATIONS: \$925 BILLION

TOTAL M&O SPENDING, 1994-2013 (2014\$)



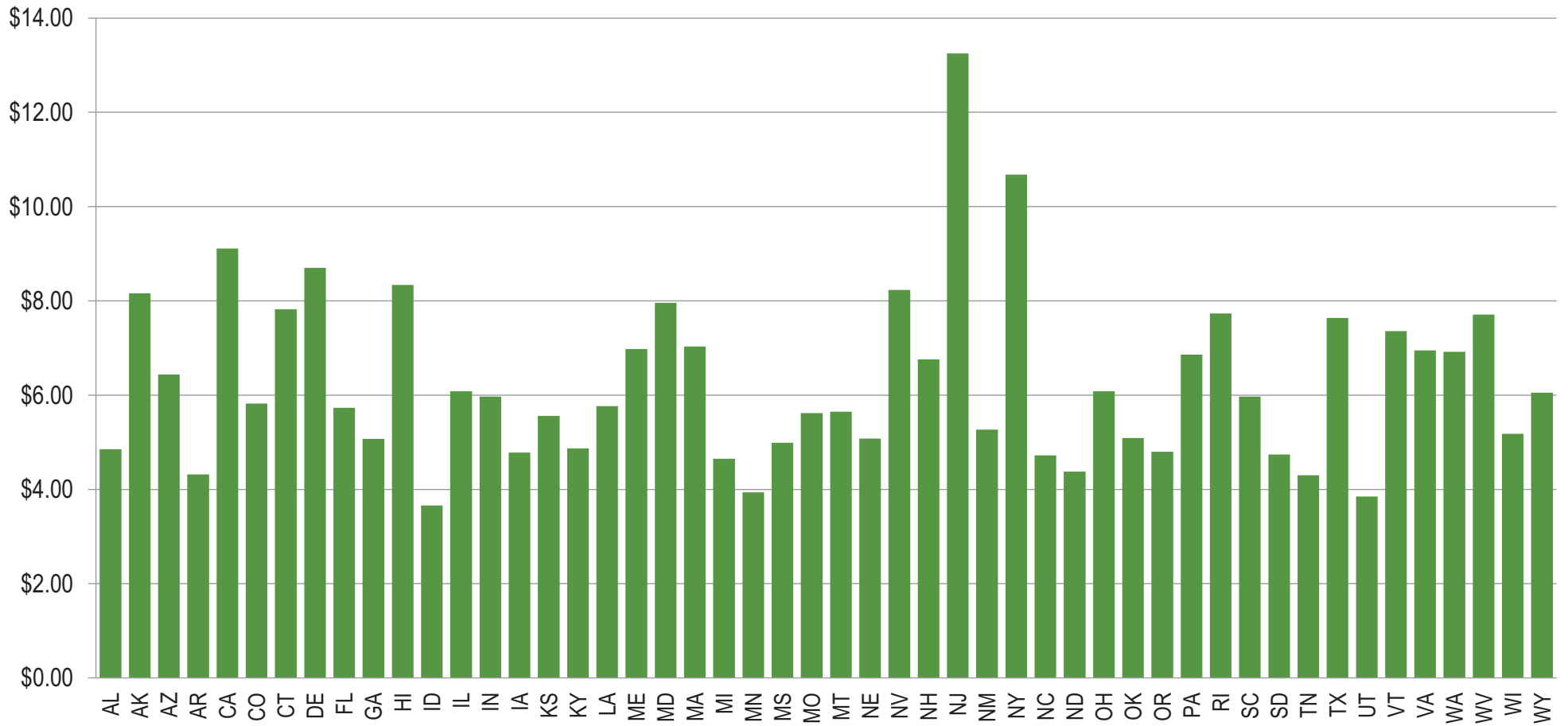
MAINTENANCE & OPERATIONS SPEND PER STUDENT

FY2011-2013 Annual Average (in 2014\$)



MAINTENANCE & OPERATIONS SPEND PER GSF

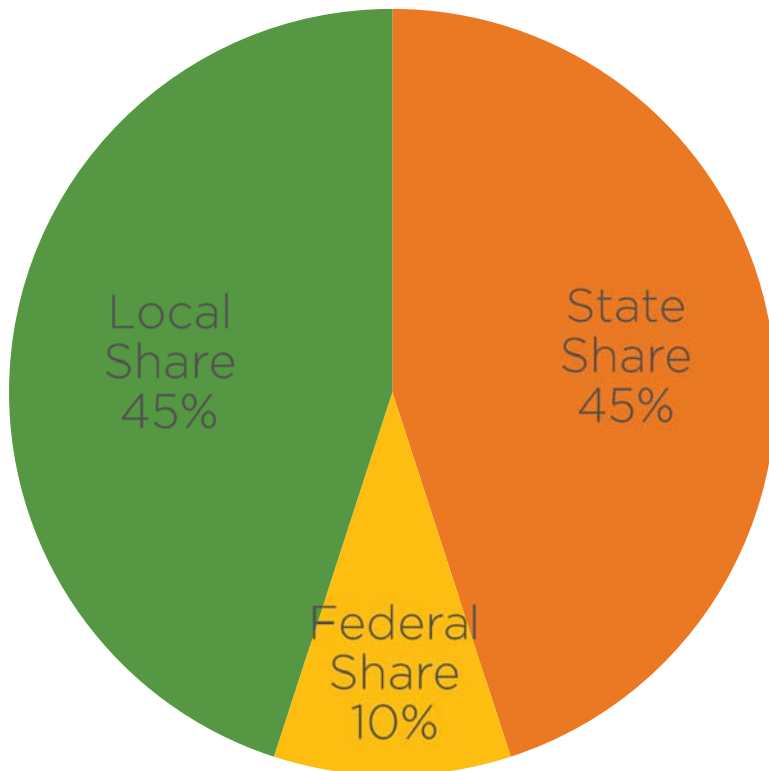
FY2011-2013 Annual Average (in 2014\$)



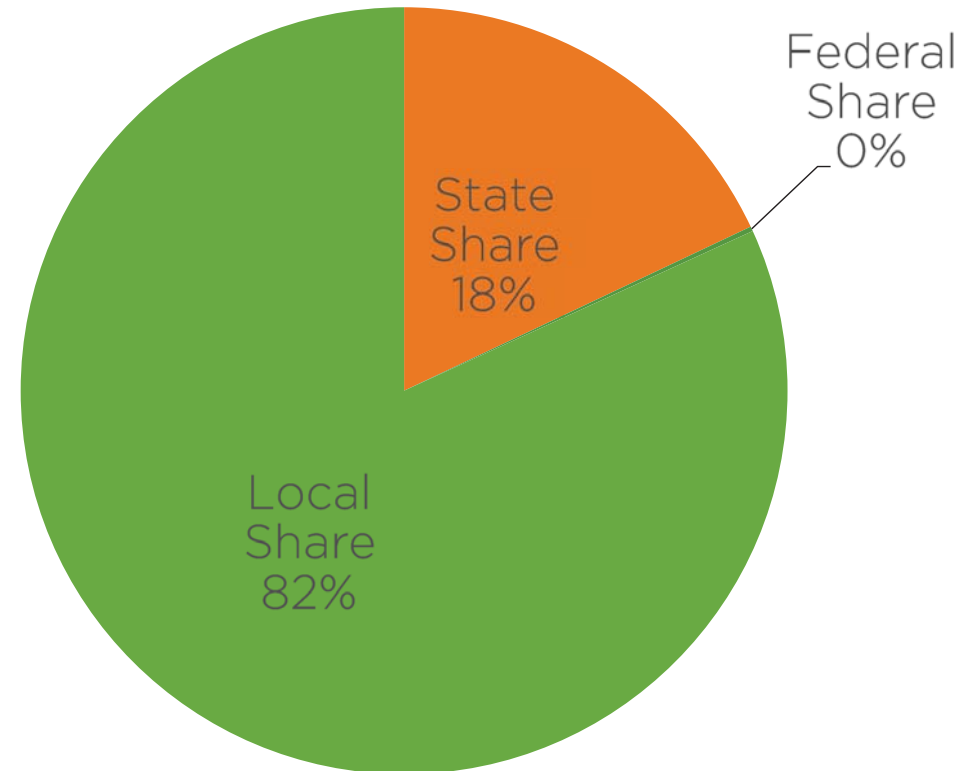
AN INEQUITABLE FUNDING SYSTEM

Local communities pay 45% of M&O and 82% of capital construction outlay

M&O COSTS



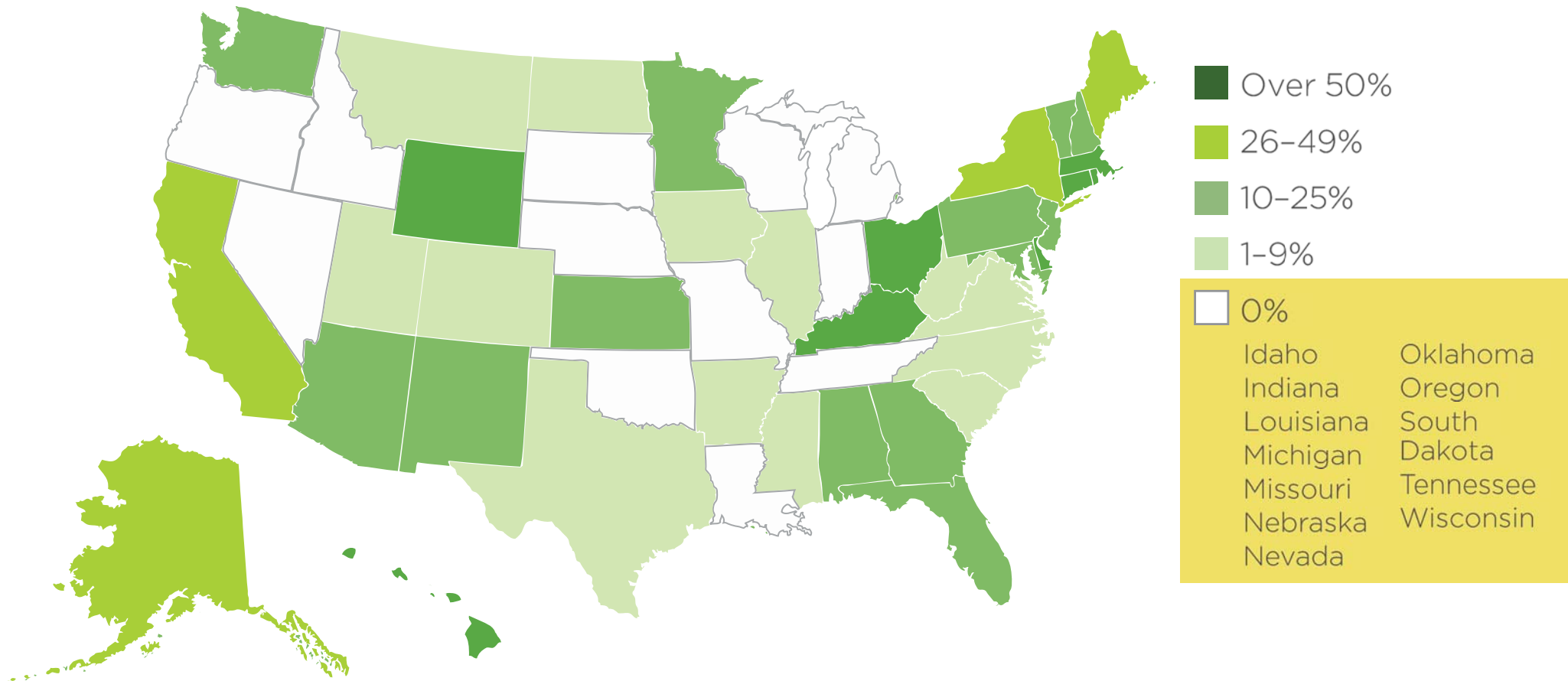
CAPITAL COSTS



Because local wealth varies greatly, some communities have modern, high-quality schools, while others do not.

12 STATES PAY ZERO CONSTRUCTION COSTS

STATE SHARE OF FUNDING FOR CAPITAL OUTLAY, FY 1995-2013



CURRENT REPLACEMENT VALUE FOR K-12 PUBLIC SCHOOLS

NEW CONSTRUCTION COST

AVERAGE COST PER GROSS SQUARE FOOT

\$256

X

FACILITIES

TOTAL GROSS SQUARE FOOTAGE

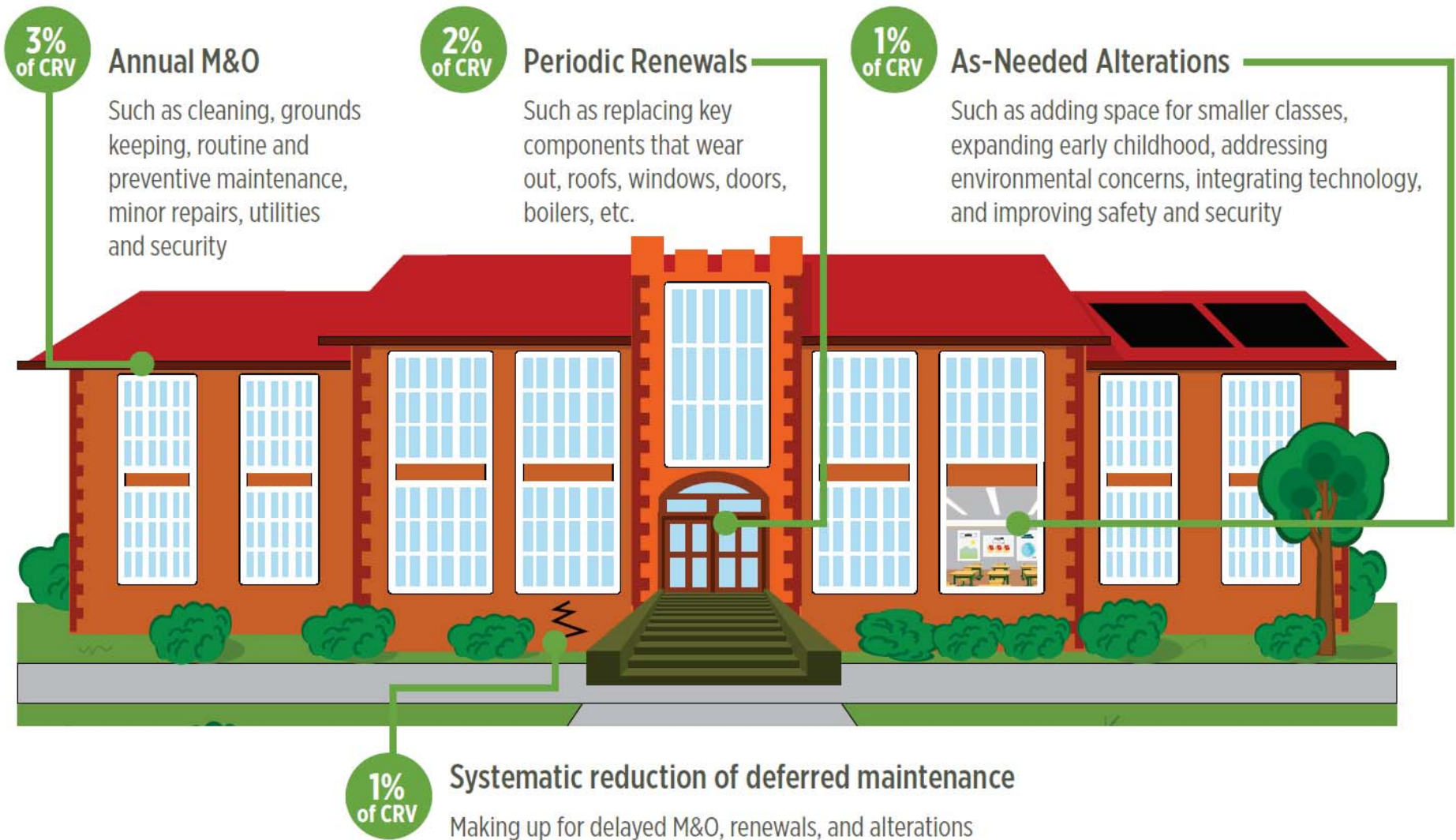
7.5 BILLION

=

CURRENT REPLACEMENT VALUE

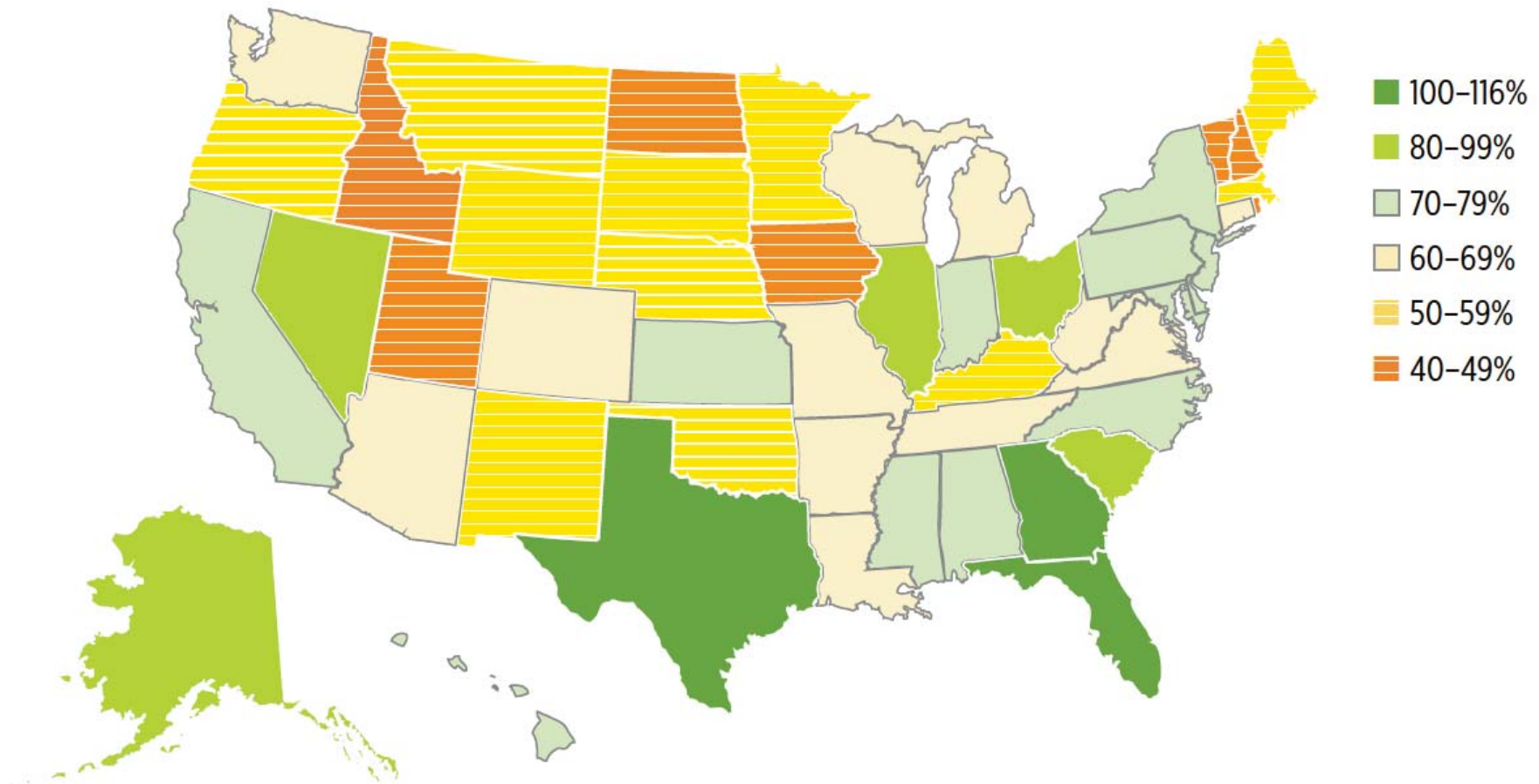
\$1.937 TRILLION

MODERN STANDARDS FOR K-12 FACILITIES



ON AVERAGE, STATES SPENDING ONLY 68% OF MODERN STANDARDS

Percentage of standard met by historic M&O spending and capital investment, FY2015



NATIONALLY, PROJECTED GAP IN ANNUAL SPENDING WILL BE \$46 BILLION

		Modern Standards	Historic Spending	Projected Annual Gap
TOTAL K-12 FACILITIES	Maintenance & Operations @ 3% CRV	\$58 billion	\$50 billion	\$8 billion
	Capital Construction @ 4% CRV	\$77 billion	\$49 billion	\$28 billion
	New Facilities for 2.7 million new seats	\$10 billion		\$10 billion
	TOTAL	\$145 billion	\$99 billion	\$46 billion

CALL TO ACTION

PROVIDE HEALTHY, SAFE, EDUCATIONALLY INSPIRING, AND ENVIRONMENTALLY SUSTAINABLE FACILITIES FOR ALL COMMUNITIES

1. Understand your community's public school facilities.
2. Engage in education facilities planning.
3. Support new public funding.
4. Leverage public and private resources.

stateofourschools.org

Join the conversation on Twitter using #StateofOurSchools

State of Our Schools: America's K-12 Facilities is under embargo until 3:00 AM on Wednesday, March 23.



Questions and Answers



Thank You

Crystal McDonald

Better Buildings Challenge

K-12 Sector Lead

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