



**GREEN SCHOOLS FOCUS**



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ROCKVILLE, MARYLAND

**GREEN SCHOOLS FOCUS**

**What we will talk about today...**

- The Green MCPS Programs
- How the programs are funded
- Why LEED?
- Green Building Plans and Pilots
- First Public LEED School in Maryland – Great Seneca Creek ES in Germantown
- Lessons Learned

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**School Facilities of MCPS**


- MCPS has 194 Schools and almost 140,000 students, largest district in MD
- Overall almost 20 million sf of facilities
- FY 2007 - 2012 CIP \$1.17 billion
- FY 2007 Operating Budget \$1.8 billion
- Increase in enrollment and class size reduction = 720 portable classrooms

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**Sustainability at MCPS**

- Tools for Schools – IAQ
- Integrated Pest Management – IPM
- Outdoor Education
- Greening of School Bus Fleet
- MCPS Recycling
- Energy Resources Team
  - Green Schools Focus



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**Green Schools Focus Programs**

- Energy Management
  - Utility Procurement
- Green Building Program
  - Standard Reviews + LEED Pilots
- School based Energy Conservation Programs:
  - SERT - School Eco Response Team
  - SERT Green Schools for MS + HS

*Green is now building*

**SERT**  
Power to Save

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**School Programs**

- SERT since 1991
- Saved \$688,000 in FY 2004 and approx. 1 million in FY 2005
- Mandatory since 2004

**SERT**  
Power to Save

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**MCPS Total Energy Use 2005/6 \***

**\$33 million = \$1.65/sf/year**

Other 25%	Heating 45%
Lighting 18%	Cooling 12%

\* Utility bills have increased by 55% from 2002/3

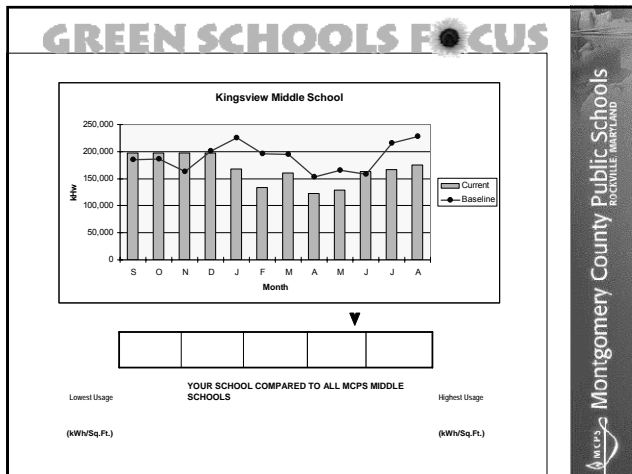
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**MCPS Total Electricity Uses**

Cooling 24%	Fans 3%	Portables 7%	Interior Lights 27%
Refrigeration 13%	Vending 4%	Computers 20%	Exterior Lights 4%

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**Energy Waste by Users = 5%-15%**

- Lights and Equipment OFF
- De-lamping
- Closing of Doors and Windows
- Operation of Blinds
- Energy Management Systems - Scheduling
- Portable Classrooms
- Kitchens and Cafeterias

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**Energy Conservation Projects**

- Exterior Light Controls
- Thermostat Calibrations
- Relamp 32W to 25W
- Eliminate Less Profitable Vending Machines
- Energy Efficient Monitors System Wide
- Task Lighting
- Energy Efficient Computers and Monitors
- Computer Lab Lighting Reduction
- Intensity SERT Efforts
- Unplug Water Coolers
- Consolidate After Hours Events
- Consolidate Food Service Refrigerators over summer

**\$3,864,167 Investment**

**\$5,864,937 Annual Savings**

**0.66 years Payback**

**\$1,999,870 savings in one year**

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**Classroom Task Lighting**

**Cost \$9**

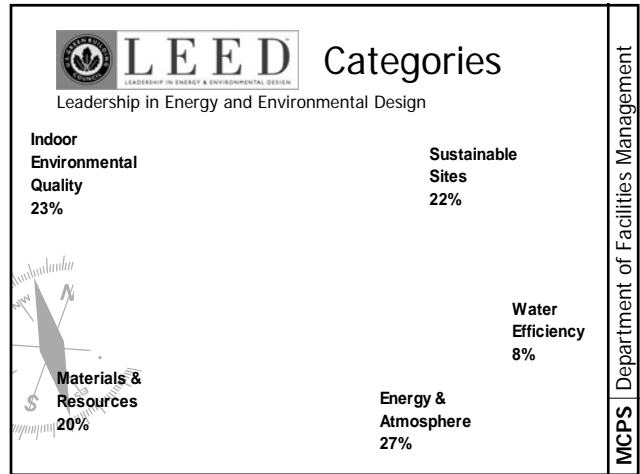
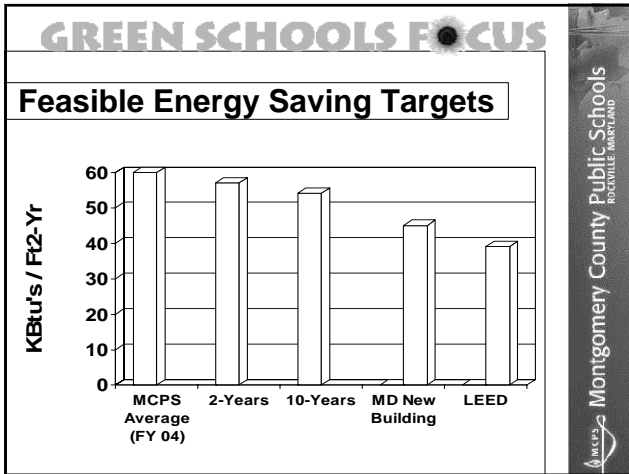
**Cost \$250,200**

**Savings \$460,000**

**Payback 0.54 Years**

**1360 Watt versus 13 Watt**

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2003 Score	2005 Score
10 LEED Points	26 LEED Points

### Why LEED™ NC for MCPS?

- ▶ Roadmap to meet Excellence Goals
- ▶ Reduction of Maintenance and Operation Costs
- ▶ 3rd Party Performance Verification
- ▶ Design to exceed code compliance
- ▶ Healthy and comfortable buildings
- ▶ Environmental stewardship

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**MCPS High Performance Building Plan – since 2003**



- Apply LEED™ Rating System
- Provide Education and Training in LEED™ & High Performance Green Building Strategies
- Apply Energy Star Rating during Design
- LEED™ Review of all School Designs
- LEED™ in Architectural and MEP Design Guidelines and Standards
- LEED™ Pilot Project

Green Schools Building

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**LEED™ Application Guide for Schools**

- National Committee with CHPS, NC, NJ, MCPS
- Launch of pilot at GreenBuild 2006 in November in Denver
- New credits specific to schools and credit modifications
- Based on LEED NC 2.2

Green Schools Building

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**Review of Standard Specifications**

- Construction Waste Management Plan
- Indoor Air Quality Management Plan
- Recycled and Renewable Content for Materials and Finishes
- Low-Emitting and local Materials
- Energy Star Roofs
- Geothermal



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**Review of Standard Specifications**

- **No Brainers**
  - Easy to implement within standard budgets e.g. high recycled content and regional materials
- **Light Green \$**
  - Green technology with short payback, specified as add. alternates e.g. occupancy sensors
- **Dark Green \$\$**
  - Innovative green technology with high environmental + educational benefits e.g. rainwater harvesting for toilet flushing


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### Green Building Pilots

- Geothermal
- Waterless Urinals
- 1. **Vegetated "Green" Roofs**
- Transparent Roller Shades
- Green "Learning Cottage"
- Healthy High Performance Cleaning
- Pervious Pavement

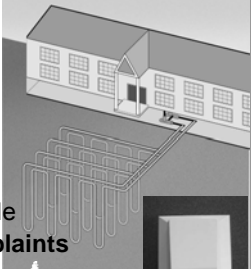




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### Geexchange is System of Choice

- One ES complete
- Three more under construction
- Saves \$0.45/sf/year
- Room By Room Control (+/- 2 F Adjustable)
- Heating/Cooling Override
- **No Temperature Complaints** (first 5 years)

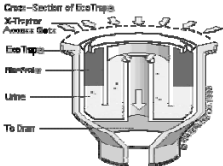

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### No Flush Urinals Pilot

- Martin Luther King Middle School (18)
- Shady Grove Maintenance Depot (6)
- Loiederman MS (8)

– Annual savings of \$200 to \$350 per urinal - \$4,600 at MLK MS

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### Vegetated "Green" Roof Pilot

at Northwood High School

- Extensive Green Roof Pilot
- \$15,000 grant from Chesapeake Bay Trust
- Installed August 2005
- First on public school in MD





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**Vegetated "Green" Roof Pilot**


Day 1  
August 2005




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**Northwood HS – Interior Views**



Louver Metal Blinds:  
irregular,  
two mechanisms



Roller Shades:  
translucent  
homogenous  
View to outside,  
but not in


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**Green Learning Cottage -Portables**


- Increase in enrollment and class size reduction = 720 portable classrooms
- IAQ issues
- Green Materials
- Energy Efficiency
- More Thermal Comfort
- Reduction of Noise
- Popularity – One Room School House
- MCPS Design Challenge – CEFPi School Building Week 2006



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**Portable Classroom Design Challenge**

**School Building Week 2006**

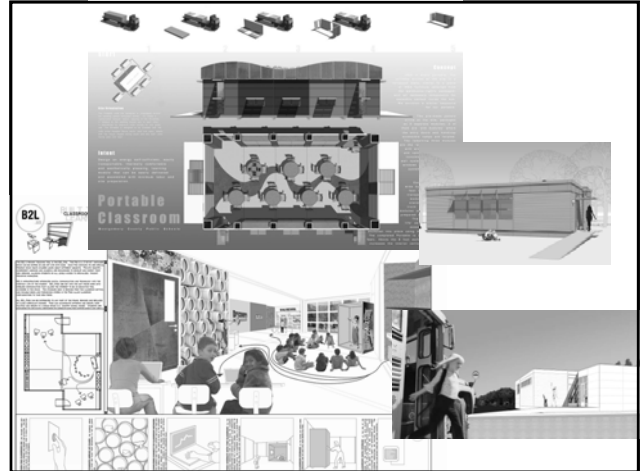


Green Building MCPS

cefpfi  
Partnership for Efficient Public Schools



Emerging Green Builders



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HOME ABOUT US SCHOOLS COMMUNITY FOR PARENTS FOR STUDENTS FOR STAFF

**GREEN SCHOOLS**

- SEEL
- SEEL Green Schools
- Green Building
- Energy
- Resources
- Energy Data
- Recycling
- DEI

**GREEN BUILDING**

- High Performance Green Buildings
- Plans
- Design
- Classrooms
- Design Challenges
- Green Buildings
- Renovations
- Division of Construction
- Indoor Air Quality
- Schools

**Healthy High Performance Cleaning Initiative**

**Green Building**

Healthy High Performance Cleaning Initiative

The Division of School Plant Operations is in the process of implementing a Healthy High Performance Cleaning Initiative (HPC) across the system to ensure that our schools are clean, safe, and healthy. As a result, we will be implementing projects and procedures at various sites to ensure that performance.

School Plant Operations

Green Cleaning Pilots at MCPS

Elementary School Oakland Terrace ES

Wilde School Hopewell HS

High School Parkway HS

Case Study from Long Branch Connecticut

Green Cleaning Resources

List of MCPS approved subcontractor database

MCPS Indoor Air Quality Program - Guidelines

The New American Dream Initiative on Green Chemistry

Lead in Green Cleaning Products

Green Fleets Program

**Healthy High Performance Cleaning Initiative**

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**LEED™ Pilot – Great Seneca Creek ES in Germantown – September 2006**




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### 1<sup>st</sup> MCPS Eco-Charrette in 2003






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### SUSTAINABLE SITES

- **COMPACT FOOTPRINT/OVERLAPPING FIELDS:** By making the school a compact, two-story structure with double loaded corridors, we were able to avoid long wings and keep the building footprint closer to a light square. The ball fields overlap one another to minimize environmental impact.
- **WETLANDS:** At Northwest ES 7, school site does not encroach on neighboring stream valley or wetlands on the property.
- **LIGHT POLLUTION REDUCTION**

**CLARKSBURG/DAMASCUS ES #7**

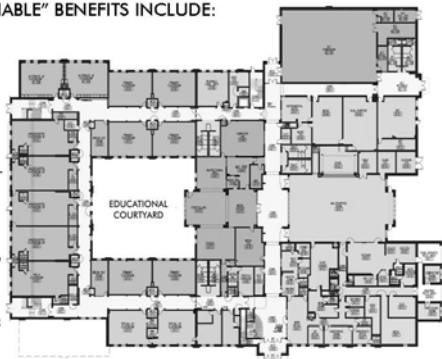


**NORTHWEST ES #7**

- **SHADE and HIGH-ALBEDO:** Provide shade on play and parking paving from site trees and use high-albedo materials (such as concrete paving).
- **ENERGY STAR ROOF:** Energy Star-rated coating over built-up roofing to reduce heat island effect on the building's flat roofs.
- **GEOTHERMAL:** Both schools will utilize adjacent ball-fields for ground-source well fields (efficient mechanical system).
- **REFORESTATION/MEADOWS:** at Northwest ES 7.
- **NATIVE PLANTINGS:** Require no site watering.

### NORTHWEST ES #7 + CLARKSBURG/DAMASCUS ES #7 "GREEN"/"SUSTAINABLE" BENEFITS INCLUDE:

- BIKE STORAGE W/ SHOWER/CHANGING ROOMS
- WATERLESS URINALS
- DUAL-FLUSH TOILETS IN KINDERGARTEN CLASSROOMS
- LOW-FLOW AERATORS AND SHOWER HEADS
- SENSORIED FAUCETS IN MULTI-FOUNT LAVATORIES
- FIBERGLASS WINDOWS W/ LOW-E, INSULATED GLASS
- COMMISSIONING DURING DESIGN, CONSTRUCTION, AND OCCUPANCY
- STORAGE AND COLLECTION OF RECYCLABLES (RECYCLING ROOM AT LOADING DOCK FOR SORTING)




EDUCATIONAL COURTYARD

FIRST FLOOR PLAN

FRONT ENTRY

## 43% Water Savings

### NORTHWEST ES #7 + CLARKSBURG/DAMASCUS ES #7 FRONT ENTRY ELEVATION




**Windows:**  
Typical classrooms are oriented in the long direction along the window wall to maximize daylight.  
Large fiberglass windows with double-paned, low-e insulating glazing in every classroom to maximize natural daylight transmittance into the room, but control radiant heat transfer.

**Materials:**

Metal shingles


Locally-available brick



<h3>Lessons Learned</h3> <ul style="list-style-type: none"> <li>▶ Get Leadership Commitment Day 1</li> <li>▶ Get Leadership Commitment Day 2,3,4,5,6...</li> <li>▶ Make a Plan with Phases</li> <li>▶ Document Potential and Actual Savings</li> <li>▶ Focus on Solving current O&amp;M Problems</li> <li>▶ Introduce LEED™ early in SD</li> <li>▶ Make time to document success stories</li> <li>▶ Start w/ small pilots with plan for more</li> <li>▶ Commit low and aim high</li> </ul>	Department of Facilities Management <b>MCPS</b>
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<h3>Lessons Learned</h3> <ul style="list-style-type: none"> <li>▶ Hire LEED™ <b>and</b> School experienced A/E and General Contractor</li> <li>▶ Contract Sustainable Design Consultant directly, not through AE</li> <li>▶ Institutionalize Green Champion and LEED Coach within the school system</li> <li>▶ Invest in professional development</li> <li>▶ Add X% to Construction Budget</li> <li>▶ Educate, educate, educate...</li> </ul>	Department of Facilities Management <b>MCPS</b>
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<h2>GREEN SCHOOLS FOCUS</h2>	
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