MONTGOMERY COUNTY PUBLIC SCHOOLS, ROCKVILLE, MARYLAND

FY 2016
Environmental Sustainability
MANAGEMENT PLAN

2013 DISTRICT SUSTAINABILITY AWARD WINNER
U.S. DEPARTMENT OF EDUCATION
GreenRibbonSchools

Malcolm Baldrige
National Quality Award
2010 Award Recipient

Montgomery County Public Schools
ROCKVILLE, MARYLAND

VISION

We inspire learning by providing the greatest public education to each and every student.

MISSION

Every student will have the academic, creative problem solving, and social emotional skills to be successful in college and career.

CORE PURPOSE

Prepare all students to thrive in their future.

CORE VALUES

Learning
Relationships
Respect
Excellence
Equity

Board of Education

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Mr. Larry A. Bowers
Interim Superintendent of Schools

Dr. Maria V. Navarro
Chief Academic Officer

Dr. Kimberly A. Statham
Deputy Superintendent of School Support and Improvement

Dr. Andrew M. Zuckerman
Chief Operating Officer

850 Hungerford Drive
Rockville, Maryland 20850
www.montgomeryschoolsmd.org

A Letter From the Interim Superintendent

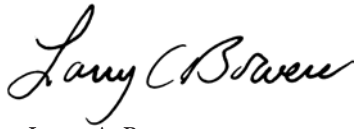
Dear Community Members:

MONTGOMERY COUNTY PUBLIC SCHOOLS (MCPS) is committed to responsible environmental stewardship. Our students and staff take pride in our conservation efforts to ensure that the earth's natural resources are preserved for present and future generations. MCPS is recognized as a national leader in sustainability and environmental stewardship. Since 2012, six MCPS schools have been recognized with the National Green Ribbon Award by the U.S. Department of Education. In 2013, MCPS was among the first 15 school districts in the nation to receive the District Sustainability Award from the U.S. Department of Education. These recognitions are a testament of our dedication to environmental sustainability.

Through the years, MCPS has made tremendous strides in reducing greenhouse gas emissions by making environmentally friendly decisions in the areas of building construction and maintenance, resource conservation, transportation, materials and waste cycles, and information technology. MCPS continues to be a leader in green and healthy-schools initiatives and integrates environmental literacy into the curriculum and instructional programs at all grade levels. These actions not only help us to make our earth a better place to live, but more importantly, help to mold our students to be responsible environmental stewards and future leaders.

The Fiscal Year 2016 Environmental Sustainability Management Plan continues to celebrate the milestones that MCPS has achieved and provides updates to the progress in the areas of environmental sustainability efforts. This document plots our path forward and conveys goals and strategies as we continue to work together with our students, staff, and community members to make our planet greener each day.

Sincerely,



Larry A. Bowers
Interim Superintendent of Schools
Montgomery County Public Schools

We teach our students the value of protecting our natural resources and being good stewards of the environment.

2013 DISTRICT SUSTAINABILITY AWARD WINNER
U.S. DEPARTMENT OF EDUCATION
GreenRibbonSchools

Malcolm Baldrige
National Quality Award

Montgomery County Public Schools (MCPS) is the recipient of multiple 2012–2015 U.S. Department of Education Green Ribbon School Awards:

- Francis Scott Key Middle School (2012)
- Cedar Grove Elementary School (2013)
- Summit Hall Elementary School (2013)
- District Sustainability Award (2013)
- Travilah Elementary School (2014)
- Northwest High School (2015)
- Sligo Middle School (2016)

MCPS is also the recipient of the Malcolm Baldrige National Quality Award (2010), the nation's highest Presidential honor for performance excellence, including a focus on organizational sustainability.

About MCPS

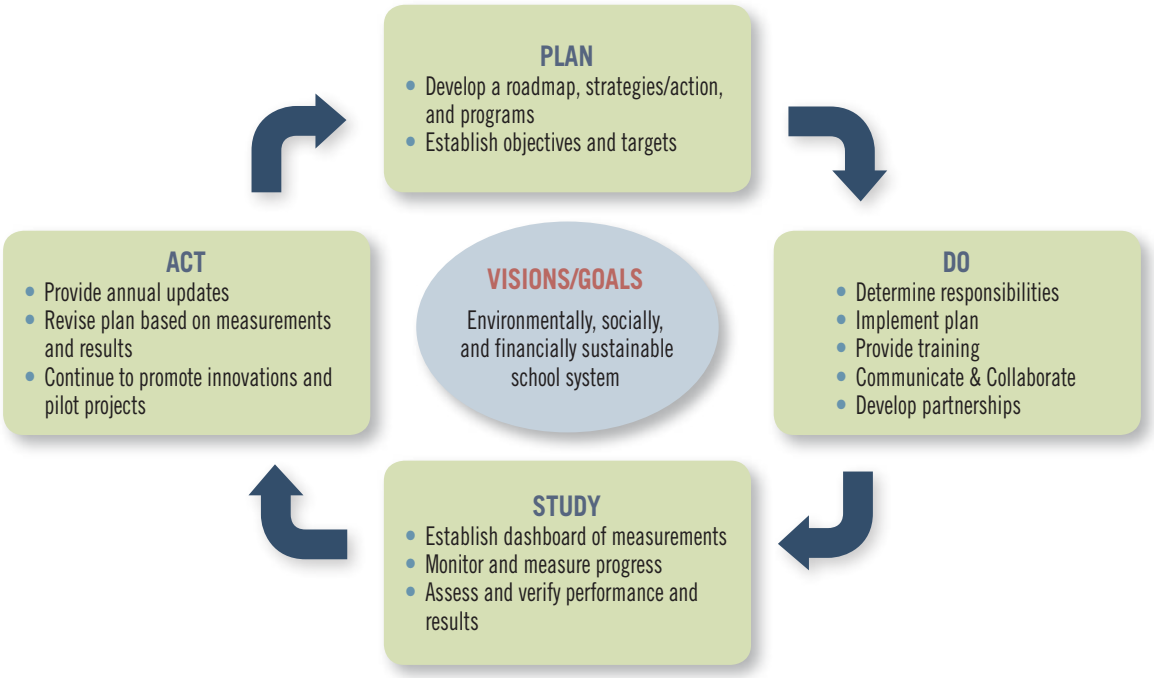
IN THE 2015–2016 SCHOOL YEAR, MCPS operated 202 schools with a student enrollment of 156,447. MCPS is a very diverse school system in terms of race/ethnicity and socioeconomics. In the 2015–2016 school year, 30.1 percent of enrollment was Non-Hispanic White, 29.2 percent Hispanic, 21.4 percent African American, and 14.2 percent Asian. Hispanic student enrollment is the fastest growing share of MCPS enrollment. Increasing socioeconomic diversity also characterizes our enrollment. In 2015–2016, 35 percent of enrollment qualifies for the Free and Reduced-price Meals program.

MCPS IS THE LARGEST SCHOOL SYSTEM IN MARYLAND and the 17th largest school system in the nation. Also, it is the most rapidly growing school system in Maryland. Since 2007, MCPS has grown by more than 18,000 students; and projections show that an additional 10,000 will enroll by 2021. This rapid pace of growth in enrollment presents a challenge in providing adequate school capacity. The Board of Education Approved *FY 2017 Capital Budget* and the *FY 2017–2022 Capital Improvements Program* total $1.729 billion. Funds to add much-needed school capacity compete with funds needed to revitalize aging schools and provide for building system maintenance. Obtaining funding at a level commensurate with MCPS's facility needs is an ongoing challenge, as county and state funding sources are limited.

OVER THE PAST DECADE, MCPS HAS INTENSIFIED ITS COMMITMENT TO SUSTAINABILITY, which provides a solid foundation on which to build. The facility assets are approximately 25.6 million square feet, spread over 3,600 acres of real property. A vibrant community of more than 22,000 employees, consisting of teachers, administrators, and supporting service employees ensure that students receive the best education in a safe and comfortable learning environment. MCPS receives support, advice, and direction from engaged community partners and from intergovernmental agencies.

MCPS IS THE RECIPIENT OF NUMEROUS AWARDS, including the District Sustainability Award by the U.S. Department of Education (2013) and the Malcolm Baldrige National Quality Award (2010), the nation's highest Presidential honor for performance excellence, including a focus on organizational sustainability. The U.S. Department of Education National Green Ribbon Schools (ED-GRS) Award began in the 2011–2012 school year. Since then, Northwest High School; Francis Scott Key and Sligo middle schools; and Cedar Grove, Summit Hall, and Travilah elementary schools have been proud recipients of this much-sought-after national recognition. Our schools are encouraged to seek a voluntary Maryland Green School certification each year. As of April 2016, 81 MCPS schools have been successful in fulfilling the requirements and have received the Maryland Green School certification.

About This Document



THE MCPS INAUGURAL Environmental Sustainability Management Plan was published in June 2014 to celebrate all MCPS has achieved, explain the current state, and chart a course for the next stages of our sustainability programs and practices. Building on that groundwork, this document is a continuation of our sustainability management plan. It provides updates on five categories: Student Education, Awareness, and Actions; Building Construction, Maintenance, and Operations; Energy and Natural Resource Conservation; Materials and Waste Cycles; and Transportation.

The FY 2016 Environmental Sustainability Management Plan (ESMP) updates the goals set forth in the FY 2014 ESMP, sets short-term goals, and adjusts the strategies as necessary to accomplish the long-term goals. Although MCPS is proud of the significant progress made each day by our students, staff, and school communities to preserve our natural resources; emphasis to achieve more needs to continue in order to ensure the environmental sustainability for present and future generations.

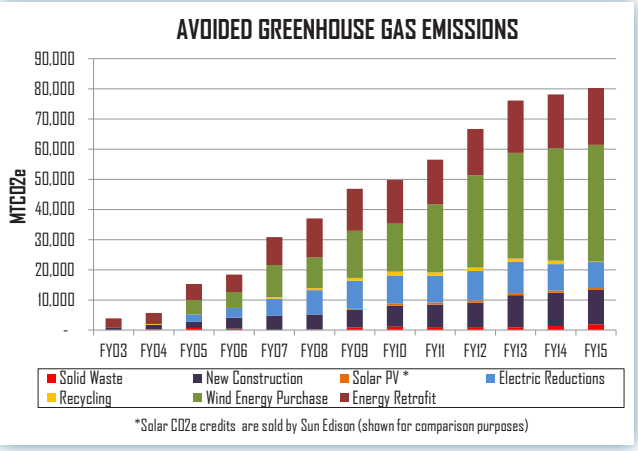
The MCPS Environmental Sustainability Management Plan is well-aligned with The MCPS Strategic Planning Framework and the *Culture of Respect Compact*. As part of our emphasis on excellence and organizational effectiveness, based on the core values of the strategic plan, our accomplishments over four decades are a direct result of the school system's commitment to environmental sustainability and continuous improvement.

Our Impact on Climate Change

OUR EARTH IS WARMING! *Earth's average temperature has risen by 1.5°F over the past century, and is projected to rise another 0.5, to 8.6°F over the next 100 years. Small changes in the average temperature of the planet can translate to large and potentially dangerous shifts in climate and weather. Human activities have released large amounts of carbon dioxide and other greenhouse gases into the atmosphere.*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

THE COMPREHENSIVE DISTRICTWIDE PROGRAM to reduce the impact on our environmental footprint includes recycling initiatives, energy conservation efforts, and a commitment to green construction practices in all building projects. We teach our students the value of protecting our natural resources and being good stewards of the environment.



In FY 2015, MCPS has reduced its greenhouse gas emissions (GHG) by nearly 80,000 MTCO2e, through a variety of environmental conservation programs and initiatives, as described in this update. These activities resulted in a carbon footprint reduction of 31 percent, compared with 2003.

The avoided GHG emissions in FY 2015 is the equivalent of reducing approximately 190,476,190 miles of driving by an average passenger vehicle or reducing the amount of GHG generated to power 11,004 homes for an entire year.

11,000 homes' electricity use for one year

190,476,190 miles driven by an average passenger vehicle

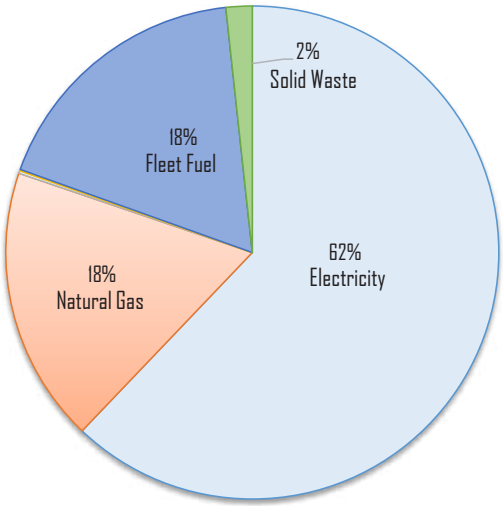
The largest contributor of GHG emissions is associated with the heating, cooling, and lighting of our schools and facilities. Electricity and natural gas account for approximately 80 percent of the GHG emissions of MCPS. Fleet fuel used for buses that drove 19,237,356 miles, to transport 101,949 students, and other service vehicles resulted in the second highest source of GHG emissions in FY 2015. The priority to reduce GHG emissions persists in the areas of building energy efficiency and fleet vehicle efficiency—the categories of greatest opportunity.

Our Vision for Sustainability

MCPS IS A STELLAR EXAMPLE of how to collaborate and be environmentally, socially, and financially sustainable across a school system. We have built a world-class education for sustainability into the curriculum and programs in order to equip our students with skills, knowledge, and an ethic of sustainability.

Our commitment to sustainability helps us create healthy learning and living environments for our students, teachers, staff, and community by integrating economic, social, and environmental considerations into all of our decisions. MCPS will continue to partner and collaborate with enthusiastic parents, engaged community partners, and intergovernmental agencies, in addition to working directly with schools to pursue our vision for environmental sustainability. As responsible environmental stewards of the earth, our students and staff conduct stream studies, create edible and perennial gardens and small-scale reforestation projects, and take part in Adopt-a-Road projects and local fairs, among others, to make our schools and living communities a better place for generations to come.

Fiscal Year 2015 GHG Emissions By Source



*Fuel oil and propane are less than 1%

"Don't Drop The Top" Poolesville ES students and staff learned about the hazards of plastic bottle tops to the environment, then collected thousands of colorful bottle tops to create this beautiful mural.

Student Education, Awareness, and Actions

Our progress

PROGRESS IN STUDENT EDUCATION, awareness, and actions since the publication of the FY 2014 Environmental Sustainability Management Plan have focused on the following areas:

- Environmental Education
- Increasing Conservation Awareness
- Conservation Actions and Participation

• Environmental Education

Our Neighborhood, Our Watershed, a National Oceanic and Atmospheric Administration (NOAA) grant-funded systemic and systematic Grade 4 initiative, is bringing a project-based learning Meaningful Watershed Education Experience to all 12,000 students by building the subject-matter capacity of approximately 350 teachers. Awarded in FY 2014, this grant is in its third year. Two-thirds of schools have participated in the module training and implemented the module; the remaining third will begin professional learning in summer 2016.

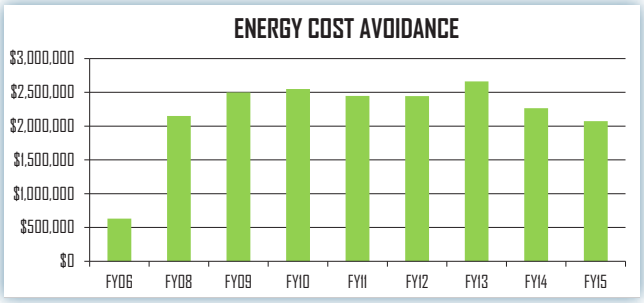
Since FY 2015, the Outdoor Environmental Educational Program (OEEP) has taken the lead in integrating Trout in the Classroom (TIC) as a systemic Meaningful Watershed Education Experience into Grade 6 classrooms by obtaining funds to gain time with teachers to provide professional learning and assist with acquiring additional grants to purchase equipment. Twenty-two middle schools are now using TIC as a project-based learning unit, involving approximately 5,000 students.

OEEP and the Department of Facilities Management are coordinating, managing, and facilitating the visits of the Maryland Agriculture Education Foundation's (MAEF) science mobile to every elementary school in MCPS over the next five-year period. The MAEF mobile has provided an environmental learning experience to approximately 15,000 students in FY 2016. It is projected that, by the end of FY 2018, 45,000 MCPS elementary school students will have had an agricultural experience on the mobile lab.

OEEP and School Energy and Recycling Team (SERT) continue to expand their use of social media platforms to inform, motivate, and reach more students, families, and school communities. Twitter™ recently has become a tool to highlight best practices in sustainability and environmental education. Additional sources for various types of gardens

and outdoor learning have been added to the OEEP website, along with several new videos to help teachers engage students in environmental Student Service Learning on the school sites.

With a focus on ensuring that outdoor environmental experiences are accessible for all students as part of an MCPS equity plan, OEEP has developed new initiatives to increase the number of underrepresented student populations engaged in OEEP programs, including priority scheduling for Title I schools in the day program, which started in FY 2014, and videos about outdoor environmental education for Spanish-speaking families, featuring Spanish-speaking parents of older students in FY 2016. Over the past two years, the participation of Title I students has increased by 50 percent in the day program. At the middle school level, MCPS developed a sustainability problem-based learning unit embedded into the Technology Systems course. The unit focuses on sustainable practices as they relate to the Maryland Voluntary Standards for Technology Education. MCPS will be developing problem-based learning units for high school science courses to align with the Next Generation Science Standards (NGSS). Many NGSS relate closely to environmental sustainability, and are expected to include problem-based learning (PBL) units where students explore and propose solutions to environmental sustainability-based problems. During the 2015–2016 school year, high schools began piloting PBL units, focused on invasive species and urban farming, in the NGSS-aligned high school biology course.



• Increasing Conservation Awareness

The School Energy and Recycling Team (SERT) program in the Department of Facilities Management guides and provides necessary resources to staff and students at all MCPS schools to foster a culture of conservation, with a special focus on energy efficiency and recycling in the school. Classroom activities, tool kits, videos, and friendly contests with awards give our students rich and rewarding experiences in environmental stewardship. During FY 2014 and FY 2015, the SERT program conducted nearly 100 outreach events at schools, including energy and recycling assemblies, Let's Do Lunch events, and Read A-louds.

The SERT program staff continue to visit all schools quarterly to recognize them for exemplary behaviors and to identify opportunities to conserve energy and increase recycling. During FY 2014 and FY 2015, the SERT program staff conducted approximately 1,600 regularly scheduled school visits, in addition to providing outreach and support to student green teams. As a result of these efforts and energy-efficient improvements to schools, MCPS achieved more than $2 million in energy cost avoidance in FY 2015.

• Conservation Actions and Participation

MCPS schools are encouraged to seek Maryland Green School Certification through the Maryland Association for Environmental and Outdoor Education (MAEOE). This voluntary certification program promotes learning that incorporates local environmental issues investigation and professional development with environmental best management practices and community stewardship. In the FY 2014 Environmental Sustainability Management Plan, MCPS set a goal for 50 percent of its schools to achieve this certification by 2024. Since FY 2014, 40 new schools have completed the requirements and received the Maryland Green School certification, and 28 schools have completed the recertification process to maintain their certification. As of April 2016, 81

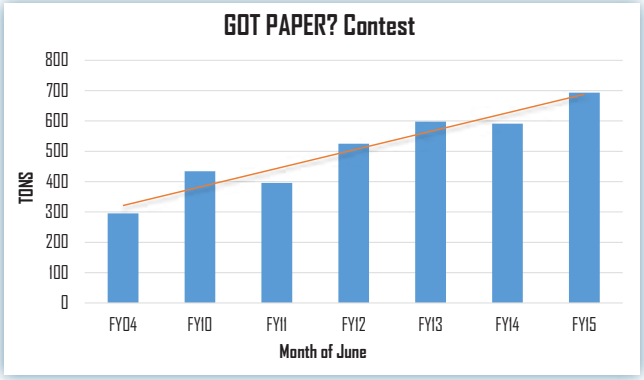
MCPS schools are proud recipients of the Maryland Green School certification. Due to the tremendous success of the schools in pursuing and achieving the Maryland Green School Certification in the past two years, MCPS has revised the FY 2014 goal for number of schools to achieve certification by 2024, increasing it to 65 percent.

SERT continues to promote the program through various annual contests, including the following:

WATT'S UP POSTER CONTEST: Schools look forward to this popular annual contest that encourages students from Grades K through 12 and staff to create posters to demonstrate their efforts in energy and water conservation and recycling. This contest creates healthy competition among students and staff to produce artwork to increase the conservation awareness among their peers systemwide. Many schools hold poster-judging contests at their schools and submit their winning entries to the SERT contest. The posters communicate the importance of environmental conservation through the artistic talents of MCPS students and staff. The winning posters are printed and distributed systemwide to increase awareness about environmental conservation. Each year, more than 70 MCPS central office staff participate as judges to select the winning posters. SERT received 261 entries during FY 2014 and FY 2015.

LEAD BY EXAMPLE AWARENESS CAMPAIGN: This campaign challenges all secondary schools to create a model resource conservation plan to include energy conservation and responsible recycling projects or initiatives toward a sustainable future. The SERT program encourages all MCPS middle and high schools to participate in the Lead by Example contest to further reinforce a culture of conservation and sustainability at their schools and in their communities.

Many of the entries include behavioral strategies, energy-efficiency projects, and awareness campaigns. Often, initiatives such as energy audits with recommended conservation practices, task lamps for staff, computer shutdowns, contests, recycling weight increase plans, video, and social media awareness strategies are practiced at the schools as a result of this campaign. All of these actions promote behaviors among students, staff, and the community to be responsible environmental stewards. The winning entries with proven projects and initiatives are highlighted in SERT Best Management Practices, an online resource for all schools to use as helpful conservation strategies and expectations for efficient building use and operations.



GOT PAPER? CONTEST: This contest was designed to maximize recycling opportunities before the end of the school year. The contest is held in June and provides students with opportunities to recycle as they clean out their lockers and as teachers clean out their classrooms and desks. The elementary, middle, and high school with the most paper recycled, by weight, during the month of June will be winners. This contest has proven to not only increase the paper recycling tonnage but has also resulted in a decrease in solid

waste. During the contest period in FY 2015, MCPS recycled 693 tons of paper, an increase of nearly 400 tons during the same period in FY 2004.

ENVIRONMENTAL SERVICE LEARNING: Grade 6 students participate in environmental service learning, which provides them with 10 hours of Student Service Learning (SSL) toward the Maryland State Department of Education (MSDE) graduation requirement for SSL. OEEP assists science teachers who are responsible for ensuring that the SSL hours occur by providing professional learning sessions for teachers to build their capacity to engage students. OEEP also collaborated with MCPS TV to produce professional development videos that present the "whys" and "hows" of specific environmental action projects. The three actions presented are invasive species removal, habitat construction, and growing perennial plants.

Long-Term Goals

- Increase student knowledge and engagement in environmental sustainability and sustainable practices.
- Use our buildings and grounds as tools to support education for environmental sustainability and outdoor stewardship.
- Make 65 percent of our schools Maryland Green School-certified, by 2024.
- Reduce annual greenhouse gas (GHG) emissions by 12,000 MTCO2e through SERT school-based energy and recycling efforts, by 2024.

Short-Term Goals

- Increase participation of students in meaningful watershed education experiences through the Grade 4 and Grade 6 curricula by 3 percent, by FY 2018.
- Increase participation of high school students in local environmental issue investigation and action by 5 percent, by FY 2018.
- Continue to create action plans that drive the work forward on the MCPS Environmental Literacy Plan.
- Develop problem-based learning units for high school science courses to align with the Next Generation Science Standards (NGSS), to be completed over the course of the next three years, with full implementation of NGSS by the 2018–2019 school year.

Strategies

- Provide ongoing professional learning to build teacher capacity to teach environmental education.
- Partner with various community stakeholders to provide professional learning for teachers around environmental sustainability.
- Identify additional grant sources to provide funding for the development and implementation of professional learning.
- Continue to use social media to highlight best practices in environmental teaching and learning.

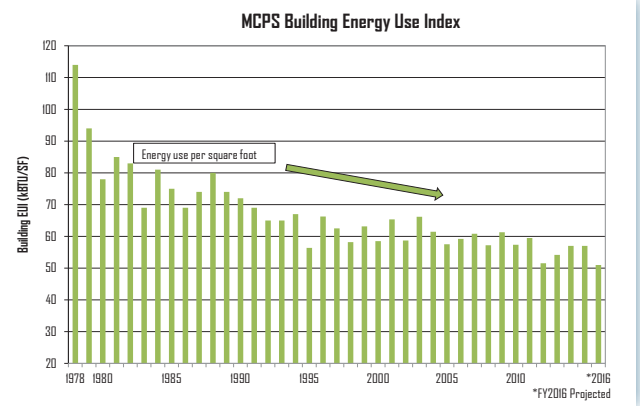
As of 2016, 81 schools are Maryland Green School certified, and six schools have received the National Green Ribbon Award

Energy and Natural Resources Conservation

Our progress

PROGRESS IN ENERGY AND NATURAL RESOURCE CONSERVATION, since publication of the FY 2014 Environmental Sustainability Management Plan, focused on the following areas:

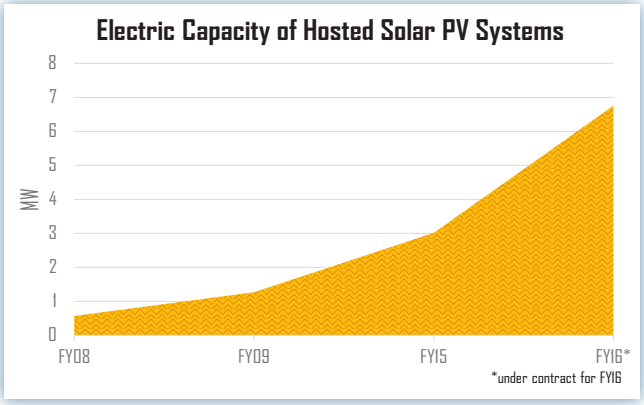
- Solar Power Purchase Agreement
- Peak Load Management (PLM)
- Lighting and Energy retrofits
- Water conservation
- Forest conservation
- Green Power Procurement
- Building occupants
- Information technology



The FY 2016 projected Energy Utilization Index (EUI) for MCPS has decreased to 51 kBTUs/SF, largely attributed to the joint efforts of various departments, divisions, students, and school-based staff. In FY 2015, the MCPS EUI was 58 kBTUs/SF, less than half of the 1978 EUI, 30 percent less than in 1989, and 20 percent less than in 2003. This is a significant accomplishment in energy conservation efforts. The MCPS portfolio of buildings are approximately 15 percent more energy efficient than the average school energy usage of 66 kBTU/SF.

• Solar Power Purchase Agreement

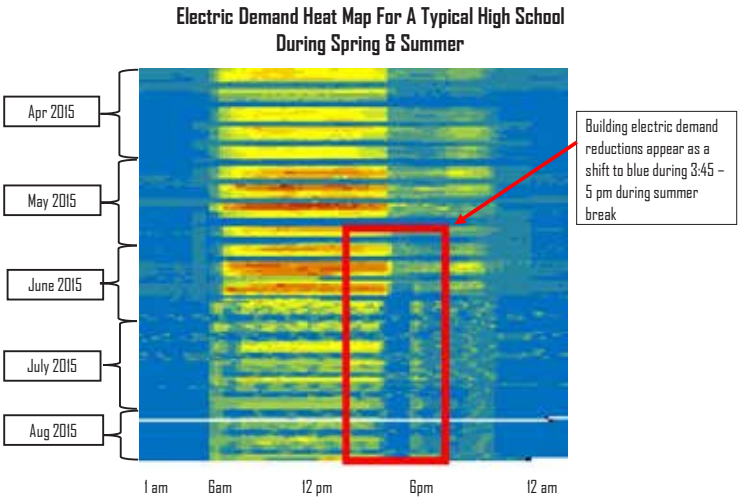
MCPS has continued the development of solar power purchase agreements (PPAs) for on-site renewable energy generation. In 2009 and 2010, MCPS began hosting large-scale rooftop photovoltaic systems at eight schools, with 1,264 kilowatts of installed capacity. In 2015, rooftop solar photovoltaic systems were installed in four schools.



As a result, MCPS lead hosting of net-metered solar power purchase agreements among school districts in Maryland, with 3,014 kilowatts (DC) of installed capacity. The 12 school sites with photovoltaic systems are projected to produce an annual capacity charge cost avoidance of approximately $145,000. MCPS currently has contracts to develop additional solar PPAs at four schools and an off-site ground mount installation. MCPS is committed to pursuing additional solar PPAs that provide positive financial incentives for the development of local solar PV arrays. MCPS is particularly interested in the potential of aggregate net metering using off-site solar PV systems.

• Peak Load Management

MCPS continues to manage its summer electric capacity charges through its Peak Load Management (PLM) program. The installation of advanced electric meters that record use in 15-minute intervals enhanced the ability to manage operations that affect electric demand at individual schools. During the summer, the Department of Facilities Management reviews the performance of schools at the critical hours, on a weekly basis, for compliance with PLM directives. Where compliance was not achieved or other scheduling problems were observed, corrective measures were undertaken and tracked to completion in a database. Cost avoidance for the efforts during the summer of 2015 was approximately $1.7 million. See Electric Demand Heat Map illustration on page 10.



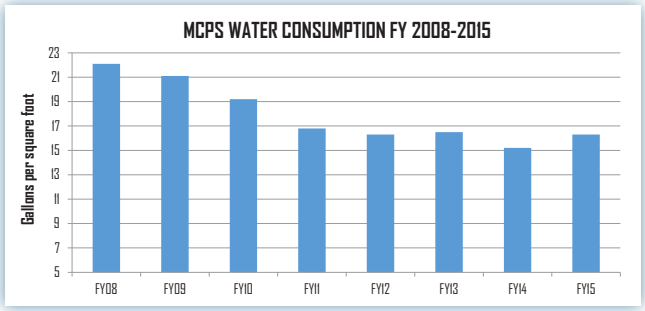
• Lighting and Energy Retrofits

During FY 2014 and FY 2015, three retrofit lighting projects were successfully completed in the auditoriums of Quince Orchard, Northwest, and Kennedy high schools. These efforts are projected to reduce five-year auditorium lighting costs by more than 66 percent. The use of Light-Emitting Diode (LED) retrofits of auditorium and parking lot lighting is among the current best applications of the LED technology in our schools. Additional applications of LED technology are being investigated and piloted.

As stated in the MCPS Resource Conservation Guidelines, among the strategies to conserve electric use is to ensure that exterior lighting is turned off during the daylight hours. Building security lighting is programmed to be on from dusk to dawn daily. Parking lot lights are programmed to be turned off at the close of the regular school day or evening activities (by 12:00 midnight at the latest). They are programed to be on from 6:00 a.m. to dawn. The school building service managers monitor the operation of the exterior lighting and notify the maintenance depot of any irregularities.

In 2015, MCPS continued the installation of digital astronomical time clocks to control the exterior lighting in schools. These electronic clocks have digital accuracy, daily sunrise/sunset adjustments, and seven-day capacitor backup for power outages. They are programmable through a laptop computer. Approximately 120 digital astronomical time switches were purchased for installation at schools with the old analog time switches and at schools where irregularities were reported due to malfunction of the time switches.

MCPS has a centralized energy management system (EMS) and installed Automated Temperature Control (ATC) systems to regulate central heating, ventilating, and air conditioning (HVAC) systems to maximize energy savings by remotely controlling the operation of the systems. In FY 2014 and FY 2015, 24 schools were upgraded to new EMS systems.



• Water Conservation

The Department of Facilities Management continues to monitor the water consumption at MCPS schools and facilities. The SERT staff conducted quarterly school visits to observe water consumption and identify water-conservation opportunities. School administration received feedback regarding issues related to building occupants' use of water. Observations regarding water wastage, due to leaks or equipment failure, were followed up with work orders for the Division of Maintenance to perform the necessary repairs.

During the winter of 2014, the Department of Facilities Management observed a very significant increase in the water bill for Damascus High School. The monthly water bill increased from an average of $8,000 to nearly $32,000 in a period of three months, resulting in an urgent investigation to detect the source of the leak. The collaborative efforts between the Department of Facilities Management and school staff resulted in the discovery of a large underground water main leak. The water leak was more than 20 feet below the ground surface and may not have been detected for a long period of

time without the constant monitoring process and the diligent efforts of MCPS staff. Repairs were expedited to avoid further waste of water and damage to the infrastructure.

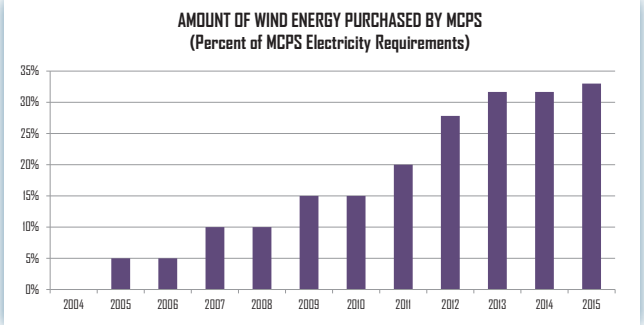
Water-efficient devices continue to be the standard on all new construction and restroom renovation projects. Since FY 2013, one new school and seven replacement schools, were built. Since 2013, restroom renovations were completed at seven high schools, 10 middle schools, and 40 elementary schools. These schools were fitted with water-efficient devices. The SERT program has focused on water conservation at the high schools because they are the largest per capita users of water, and they use large amounts for irrigation. In FY 2015, MCPS achieved more than 25 percent reduction in high school water use, compared with FY 2005.

• Forest Conservation

The Montgomery County Forest Conservation Law aims to save, maintain, and plant forested areas for the benefit of county residents and future generations. For each revitalization/expansion and addition project in the MCPS Capital Improvements Program, MCPS complies with forest conservation requirements to meet these stringent regulations. Forest-conservation measures for individual projects may include on-site retention in an undisturbed condition (on-site easement), off-site reforestation using a designated forest mitigation bank, or acquisition of an off-site protective easement for existing forested areas not currently protected. Currently, MCPS has brought under forest-conservation easements more than 44.3 acres on Board of Education property and has more than 21.8 acres of off-site forest conservation credits.

• Green Power Procurement

MCPS continues to increase its procurement of electricity and clean or renewable energy through purchase of renewable energy certificates (RECs). It is now at 33 percent. These RECs represent the carbon offsets from clean or renewable energy sources, primarily from wind and solar generators. MCPS purchases wind energy RECs to offset 20 percent of the carbon from the electricity that the school system consumes, to comply with the Montgomery County Energy Policy. MCPS purchases additional RECs that offset approximately 13 percent of our electric requirements to comply with the state of Maryland Renewable Portfolio Standards. MCPS began purchasing RECs at 5 percent in



has gradually increased the percentage of procurement. In FY 2015, the school system spent more than $500,000 to purchase RECs.

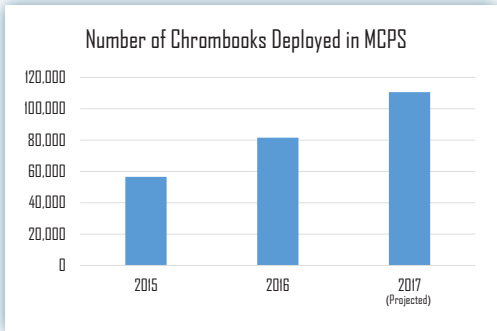
• Building Occupants

The School Energy and Recycling Team (SERT) program continues to support students and staff in all MCPS schools as they take active responsibility for reducing energy and water consumption and solid waste. Students engage in an array of SERT activities that provide productive outlets for enthusiasm and creativity to reduce environmental impacts. See the Student Education, Awareness, and Action section of this report for more information about SERT. This is a part of ongoing efforts to change the culture and promote environmental sustainability.

• Information Technology

The MCPS 2014–2016 Strategic Technology Plan provides greater access to the school system's expanding digital curriculum and enables our instructional staff to create 21st century learning spaces in all of our schools. Since the plan was first shared in 2013, school staff has been working to integrate mobile and cloud-based technologies with technology-enriched instructional and curricular resources that engage students in more explorative and interactive learning experiences. Moreover, the integration of these technologies is facilitating easier ways to assess students' understanding and provide them with timely feedback.

MCPS has begun a multiyear effort to provide all students with access to mobile computers and a cloud-based learning platform. In the fall of 2014–2015 school year, students in Grades 3, 5, and 6, as well as high school social studies classes began using the new technologies. Due to budget constraints, the expansion of the program was reduced in the 2015–2016 school year to Grade 4 and approximately 150 middle school classrooms. During 2016-2017 school year, MCPS projects to deploy approximately 27,000 devices for Grade 5,



remaining middle school classrooms, and a high school content area. It is projected that the cumulative deployment of devices from 2014-2015 to 2016-2017 school years will be more than 100,000 units. The program will expand to other grades in later years.

As a result of the increased digital curriculum and access to technology directly in our classrooms, the following reductions in the overall volume of centrally printed instructional media has occurred:

- Paper use dropped by 7 million pages from FY 2014 to FY 2015.
- In FY 2016, paper use is projected to drop by 18 million pages below FY 2015.
- There is a two-year materials saving of approximately $180,000, including paper, ink, staples, and equipment replacement parts.
- There has been less use of small printers and multifunction devices at schools.
- Paper deliveries to the schools dropped by 4,811 cartons, from FY 2014 to FY 2015.
- Approximately $65,000 was saved in paper stock in FY 2015, due to reduced paper use.
- The total two-year savings of material costs, and the avoidance of new costs due to a reduction in the use of printed instructional media, is approximately $447,000.

Long-Term Goals

- Maximize building energy efficiency, achieving a systemwide building energy use of 45 kBtu per square foot per year, by 2024.
- Complete installation of building energy management systems in all buildings, by 2024.
- Increase the use of renewable energy sources.
- Achieve a sustained reduction of energy use by computers and other equipment that plug in.
- Reduce greenhouse gas emissions from electricity use by 15 percent, by 2024.
- Reduce water consumption by 20 percent, by 2024.
- Reduce print instructional text by 70 percent, while expanding the use of digital curriculum and access to technology in schools.

Short-Term Goals

- Increase the capacity of hosted solar photovoltaic systems to 5 MW, by FY 2018.
- Retrofit 15 high school auditoriums and 10 gymnasiums with LED lighting, by FY 2018.
- Pilot LED lighting in other applications, as appropriate.
- Upgrade building Energy Management Systems at 25 schools, by FY 2018.
- Replace the centralized HVAC scheduling system for relocatable classrooms.
- Install and commission a replacement Utility Information Management System that benchmarks consumption, using EPA Portfolio Manager.
- Bring schools to 5 percent electric cost avoidance over baseline, by FY 2018.
- Provide anywhere-anytime access to people, information, and resources.
- Develop and expand virtual communities and online learning to connect classrooms and encourage resource-sharing among all stakeholders.

Strategies

- Incorporate LED lighting in areas most appropriate and cost-effective, including auditoriums, parking lots, and emergency and security lighting.
- The Department of Facilities Management will collaborate with schools to resolve high energy and water usage.
- Continue support of school-based energy teams by SERT, using school visits, outreach, and performance feedback to minimize energy and water-consumption waste.
- Perform comparative analysis of energy use at schools to identify energy-conserving opportunities.
- Employ energy audits and recommissioning in buildings that have sustained high levels of energy use.
- Continue to coordinate with the private sector to explore cost-effective power-purchasing agreements and other public-private partnerships that further MCPS's sustainable goals.
- Reprioritize expenditures for schools scheduled for FY 2016 Tech Mod services.
- Clean and test out-of-warranty desktop computers at schools.
- Clean/refurbish computers to prolong the life of the machine.
- Use MCPS Self Warranty team to repair computer hardware.

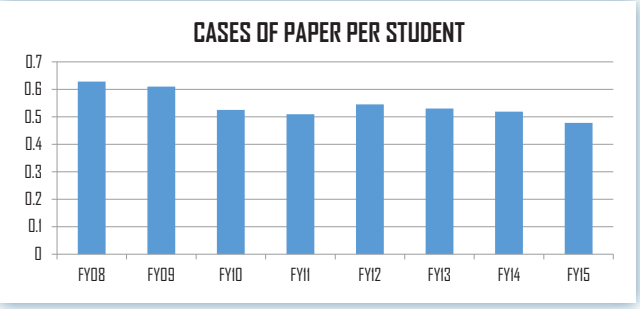
Materials and Waste Cycles

Our progress

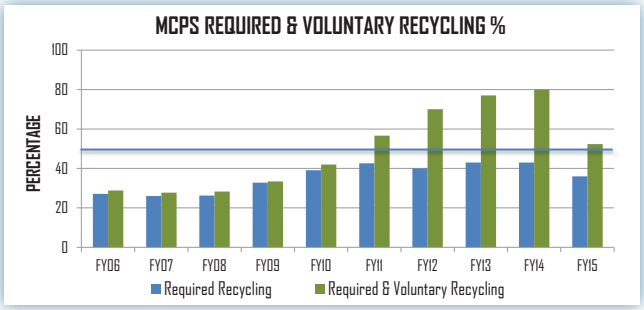
MCPS HAS ACHIEVED significant progress in sustainable practices with materials and waste cycles. The foundation of the recycling program begins with the materials required to be recycled by Montgomery County. The four streams of material that are required to be recycled are paper/cardboard, bottles/cans, yard waste, and scrap metal. In addition, MCPS aggressively pursues the recycling of materials in the voluntary category. The list of materials that are voluntarily recycled has grown to more than 20.

In addition to recycling, MCPS has sought to change its practices to use more sustainable materials that can be reused or recycled. For the past several years, the Division of Food and Nutrition Services (DFNS) has sought an affordable replacement to the polystyrene lunch trays. MCPS began using recyclable paperboard lunch trays in all schools during the 2014–2015 school year. The systemwide implementation of the use of paperboard lunch trays has proven to be a huge success by not only reducing the amount of solid waste generated by disposing of polystyrene trays, but also increasing monthly paper/cardboard recycling by nearly 50 tons.

While reducing solid waste, the school system is reducing the amount of waste generated in the first place and purchasing more environmentally responsible products. During FY 2015, MCPS purchased 26 million sheets of 8.5" x 11" paper, made of 30 percent recycled paper stock, to be used for printing of instructional, operational, and public information material.

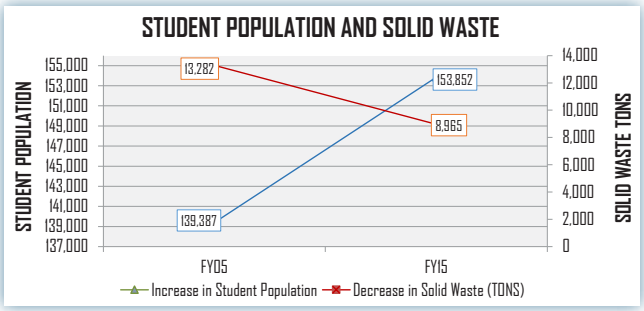


MCPS continued to make significant progress in increasing participation in recycling and decreasing solid waste in FY 2014 and FY 2015. Through increased participation, outreach, education, and with the continued deployment of interior and exterior recycling bins, our systemwide average recycling rate for the past five years for the required recyclable materials reached 41 percent; for the required and voluntary recyclable materials, our rate reached 67 percent. This is a significant improvement compared with FY 2005, when the systemwide recycling rate was under 30 percent.



During FY 2014 and FY 2015, MCPS recycled nearly 13,000 tons of required recyclable and more than 39,000 tons of voluntary recyclable material. The reduction in the overall recycling rate in FY 2015 was due largely to the reduction in capital construction projects and material from the demolition of old school buildings.

In FY 2015, the amount of solid waste dropped by 33 percent, despite an increase of more than 17,000 in student enrollment since FY 2005. The total solid waste generated in FY 2015 was nearly 4,500 tons lower than in FY 2005. These recycling and solid-waste reduction efforts saved the school system approximately $250,000 in FY 2015, by reducing "tipping" fees, the fee that MCPS pays for the disposal of solid waste.



In FY 2015, MCPS began recycling automotive windshield glass through the contracted windshield replacement vendor. The windshield glass recycling program is a new addition to the growing list of recyclable material that MCPS voluntarily recycles each year. Although the amount of windshield glass recycled was relatively small (4 tons), this is another demonstration of MCPS's commitment to aggressively pursue sustainable practices. As a result of our efforts in the windshield-glass recycling program, the Montgomery County Division of Solid Waste Services has amended its Annual Business Recycling and Waste Reduction Report to include windshield glass on the list of voluntary recyclables, giving other county businesses the opportunity to recycle and report the same.

Long-Term Goals

- Meet defined sustainable procurement guidelines of at least 50 percent of total goods and services purchased.
- Increase total recycling rates to 80 percent, by 2024.
- Reduce overall solid waste production by 10 percent, by adopting green procurement practices and placing further emphasis on reducing, reusing, and recycling.
- Develop protocols for increasing the reuse of materials, including electronics and computers, electronic parts, copiers, furniture, building maintenance parts and equipment, cleaning equipment and parts, and more.

Short-Term Goals

- Achieve 70 percent recycling rate, by 2020.
- Make sure annual solid waste tonnage does not exceed 10,000 tons for FY 2017–FY 2020.
- Deploy exterior centralized recycling collection bins to an additional 20 elementary schools, by FY 2020.

Strategies

- Continue to conduct regular review of the items being procured for use in MCPS.
- Collaborate with the MCPS Procurement Unit to identify recycling opportunities as contracts are awarded for various services and products.
- Continue SERT staff school visits to provide outreach and performance feedback to continue to support school-based conservation efforts.
- Conduct a comparative analysis of recycling participation of elementary schools and deploy exterior centralized recycling collection bins where needed to encourage further participation of students, staff, and community members.
- Identify additional volume and types of material to recycle.

Building Construction, Maintenance, and Operations

Our progress

PROGRESS IN THE CATEGORY OF BUILDING construction, maintenance, and operations since the publication of the FY 2014 Environmental Sustainability Management Plan has focused on the following areas:

- Green Buildings
- Geoexchange Systems
- Storm Water Management Program
- Energy Management Systems (EMS)
- Environmental Services and Indoor Air Quality
- HVAC Replacement Program
- Green Cleaning
- Fats, Oils, and Grease
- Equipment Repair Program

• Green Buildings

MCPS developed Facility Design Guidelines in 1993 that formally standardized processes and design/construction specifications for new and revitalization projects outlined in the Capital Improvements Program. Facility Design Guidelines continues to serve as a vital tool for producing high-quality capital projects in a consistent and timely manner. In 2003, Facility Design Guidelines was updated to incorporate sustainable design features and practices that are aligned with the various categories in Leadership in Energy and Environmental Design (LEED). To achieve LEED Gold within the LEED for Schools system involves having significant features for Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation and Design Process.

Facility	LEED Certification Level	Year Achieved
Great Seneca Creek ES (new)	Gold	2007
Francis Scott Key MS (replacement)	Gold	2009
William B. Gibbs, Jr. ES (new)	Gold	2010
Cashell ES (replacement)	Gold	2010
Carderock Springs ES (replacement)	Gold	2011
Cresthaven ES (replacement)	Gold	2011
Cabin John MS (replacement)	Gold	2012
Farmland ES (replacement/renov)	Gold	2012
Cannon Road ES (replacement)	Gold	2012
Seven Locks ES (replacement)	Gold	2012
Paint Branch HS (replacement)	Gold	2013
Flora M. Singer ES (new)	Gold	2013
Glenallan ES (replacement)	Gold	2014
Garrett Park ES (replacement)	Gold	2014
Beverly Farms ES (replacement)	Gold	2014
Weller Road ES (replacement)	Gold	2014
Herbert Hoover MS (replacement)	Gold	2015
Wilson Wims ES (new)	Gold	2015
Candlewood ES (replacement)	Silver	2015
Bel Pre ES (replacement)	Gold	2015
Gaithersburg HS (replacement)	Gold	2015
Rock Creek Forest (replacement)	Gold	2015

Using the updated Facility Design Guidelines, MCPS produced Great Seneca Creek Elementary School in August 2006, the first Gold-rated LEED-certified school in Montgomery County and the state of Maryland. Subsequently, in October 2008, Montgomery County and the state of Maryland passed legislation requiring a minimum of Silver rating in LEED certification for new major construction projects.

Since publishing the FY 2014 report, seven LEED Gold schools and one LEED Silver school have been added. MCPS now has 22 LEED-certified schools. In the summer of 2016,

the Montgomery County Council is expected to vote on the local version of the International Green Construction Code (IgCC) (2012 version). If approved, compliance with the IgCC will replace the county's requirement to meet LEED Silver certification. Maryland has adopted its own version of IgCC and will accept that in place of LEED Silver certification for state-funded projects. MCPS is in the process of comparing the local and state versions of IgCC with the newest version of LEED (LEED v4), which becomes mandatory in October 2016. The IgCC incorporates many of MCPS's current construction practices, but will add new requirements, such as envelope commissioning. Projects initiating design already have been registered as LEED v3, which will provide an acceptable alternative to IgCC for both state and county.

• Geoexchange Systems

MCPS piloted the first geoexchange system in 2001. Geoexchange, also known as geothermal, heating, and cooling systems, is one of the most energy-efficient and environmentally safe space-conditioning systems available. The geoexchange system harvests the constant ground temperature and uses the earth's mass to store energy for the purposes of heating and cooling buildings. Energy is transferred through an underground piping system between the building and ground to provide year-round heating and cooling. The system uses conventional heat pumps, similar to units found in homes, but uses the underground piping system in lieu of outdoor condenser fans. This scenario enables a building to maintain comfort conditions without using large commercial chillers and boilers. Chillers and boilers require not only annual maintenance, but also a significant space within a building. This space and maintenance avoidance tied to the overall energy efficiency results in a return on investment of 7 to 15 years for a given facility. Currently, 25 schools are being heated and cooled with the geoexchange system.

• Storm Water Management Program

Montgomery County is made up of eight major and more than 150 smaller watersheds. Storm water runoff from MCPS schools effects all these watersheds. These watersheds are tributaries to the Chesapeake Bay and its numerous estuaries. In stewardship to our environment, MCPS is committed to protecting and improving our natural resources and the quality of water in our local and regional watersheds and natural resources. MCPS implements on-site storm water management facilities that meet or exceed the latest federal, state, and local requirements, using environmental site design (ESD) techniques.

Schools with Geoexchange System	Year of Operation
Spark M. Matsunaga ES	2001
Great Seneca Creek ES	2006
Little Bennett ES	2006
Richard Montgomery HS	2007
Bells Mill ES	2009
Cashell ES	2009
Francis Scott Key MS	2009
William B. Gibbs, Jr. ES	2009
Carderock Springs ES	2010
Cresthaven ES	2010
Cabin John MS	2011
Cannon Road ES	2012
Flora M. Singer ES	2012
Garrett Park ES	2012
Paint Branch HS	2012
Seven Locks ES	2012
Beverly Farms ES	2013
Gaithersburg HS	2013
Glenallan ES	2013
Herbert Hoover MS	2013
Weller Road ES	2013
Bel Pre ES	2014
Wilson Wims ES	2014
Candlewood ES	2015
Rock Creek Forest ES	2015

MCPS is a co-permittee with the county on its Municipal Separate Storm Sewer System (MS4) Permit Program. This program was recognized by the Water Environment Federation (WEF), a not-for-profit international technical and educational organization, through a cooperative agreement with the U.S. Environmental Protection Agency (EPA). Since FY 2014, progress in the storm water management program has focused on storm water facility installation and storm water facility maintenance, repair, and staff training. MCPS

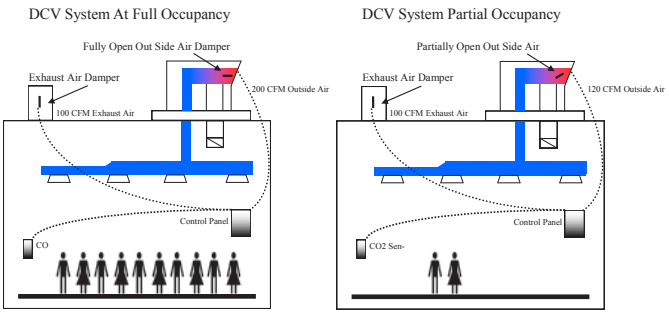
installed new storm water facilities at 10 schools in FY 2014 and 6 schools in FY 2015. MCPS spent more than $640,000 to repair and restore more than 40 facilities in FY 2015. The school system is expected to spend more than $530,000 to repair and restore approximately 30 facilities in FY 2016.

• Energy Management Program

MCPS has installed energy management systems (EMS) in most of its facilities to regulate the heating, ventilation, and air conditioning (HVAC) of the building. These systems maximize energy savings by controlling when and how the HVAC system operates. The EMS controls the HVAC systems while school is in session and minimizes usage when school is not in session. For special events and community use, schedules are consolidated and only specific areas (zones) and associated equipment are turned on, as needed.

The EMS are equipped with features to increase operating efficiency. The system regularly monitors space temperature. In the "unoccupied mode," it determines the optimal time to turn the system on and off in order to achieve or maintain the desired set point. In many of the large gathering spaces, such as lunchrooms, gymnasiums, and auditoriums, the systems are equipped with Demand Controlled Ventilation (DCV), which allows the systems to detect occupants based on CO^2 levels. Ventilation (the provision of fresh air) can then be modulated to respond to the demand and reduce energy consumption. Older EMS are being converted to web-based systems with improved graphical user interfaces (GUI) that allow for better control at the school level. The EMS upgrades result in improved quality of maintenance and allow for faster response times to HVAC-related needs.

Progress in the Energy Management Program since the publication of the FY 2014 Environmental Sustainability Management Plan has focused on continuous upgrades of the EMS throughout the school system. Since FY 2014, 71 schools have received energy management system upgrades. These range from graphics upgrades, to allow for web-based access, to full replacement of the EMS, to take advantage of new technologies and improve performance.

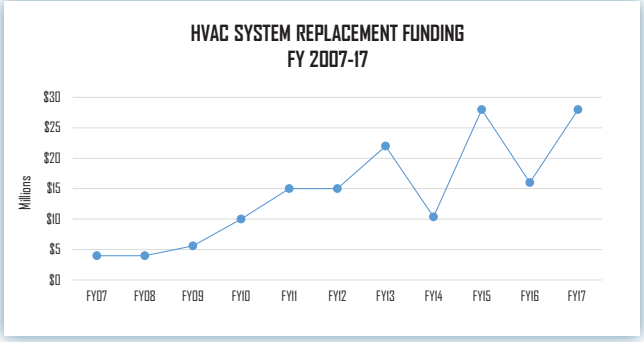


Demand Controlled Ventilation automatically adjusts the amount of outside ventilation air according to the number of occupants.

Previously, the Energy Management team supported hardware and software for nine different types of EMS. Older systems with outdated technology have been eliminated; others have been upgraded to current standards. As a result, the Energy Management team now maintains only five types of systems, resulting in improved operational efficiency.

• Environmental Services and Indoor Air Quality

Since the publication of the FY 2014 ESMP, the Indoor Air Quality (IAQ) and Environmental Services teams have initiated a Mold Prevention Task Force that meets weekly during the cooling season to proactively prevent mold outbreaks. During the summer of 2015, the team placed more than 350 temperature/humidity sensors in select schools to monitor the humidity and temperature. Many of the temperature/humidity sensors allow the levels to be monitored expediently from a centralized location. E-mail alerts were sent to school-based building service staff to inform them of upcoming high-humidity days. The IAQ team tested all classrooms in schools with ground floor contact for radon and developed mitigation plans to reduce the levels of radon where needed.



• HVAC Replacement Program

The HVAC replacement program implements the systematic replacement of HVAC equipment to maximize indoor environmental quality (IEQ) and energy performance, while reducing a significant equipment backlog. The replacement process involves a full building analysis to ensure that energy

efficiency and IEQ are optimized for each facility. MCPS has consistently highlighted the need to increase capital funding for HVAC system replacement. During FY 2014 and FY 2015, a total of 30 HVAC projects were completed. MCPS is on target to complete 16 HVAC projects during FY 2016. The FY 2017 HVAC replacement project budget is $28 million, with a total of 13 projects to be completed.

• Green Cleaning

MCPS is committed to providing a healthy-facility environment that is conducive to student learning and employee productivity. MCPS also recognizes its social responsibility to preserve natural resources for future generations. As a result of this commitment to students, staff, and the environment, the Department of Facilities Management implemented a Healthy, High-Performance Green Cleaning Plan in FY 2014. The Green Cleaning Plan serves to inform facility managers and educate the building service staff at schools on how to fulfill "green housekeeping" requirements.

The plan documents MCPS's commitment to purchasing and using cleaning and grounds-care products, equipment, and methods that reduce adverse impacts on public health and the environment. Cleaning methods specified in the plan emphasize the removal of indoor pollutants, including soils, particulates, microbes, and the like, while maintaining a safe and healthy environment for all students, staff, and other building occupants.

The Green Cleaning Plan also includes details on how to implement the program, including cleaning practices, how to store cleaning products and requirements for disposal, specific methods for cleaning, custodial equipment standards, purchasing criteria, and recycling. Requirements for grounds care and the effective operation of mechanical systems also are identified. Training, involvement, and close collaboration with students, staff, and the community are key components of the program—promoting environmental principles beyond the school walls.

In 2015, more than 90 percent of cleaning products, janitorial paper, and trash bags purchased were certified as sustainable cleaning products and materials. MCPS was one of two school districts in Maryland that were recognized with the School Environmental Health Champion Award by the U.S. Environmental Protection Agency and the Maryland Environmental Health Network.

• Fats, Oils, and Grease

This program provides the installation and maintenance of grease interceptors. MCPS installed 14 grease-abatement systems in FY 2014 and 33 in FY 2015, as part of the Washington Suburban Sanitary Commission (WSSC) fats, oils, and grease (FOG) compliance program. In total, MCPS has installed more than 350 grease-abatement systems. The proper maintenance of interceptors protects the environment by preventing sanitary sewer overflows that could contaminate local water bodies and damage property. In addition, school staff is educated on best practices to minimize FOG through awareness training. The FOG best management practices are incorporated into the Family and

Maryland Environmental Health Network

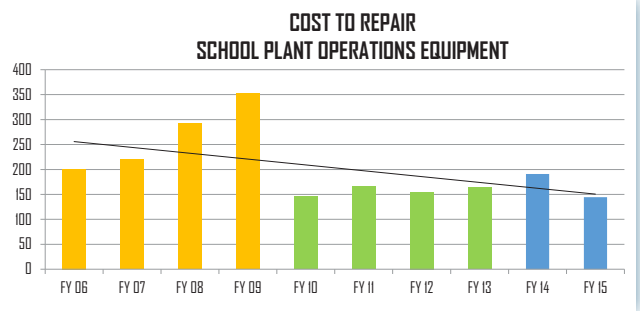
In 2015, MCPS was recognized with the School Environmental Health Champion Award by the U.S. Environmental Protection Agency and the Maryland Environmental Health Network .

Consumer Sciences (FACS) curriculum, promoting environmental stewardship communitywide.

• Equipment Repair Program

The equipment repair program performs repairs on a variety of building service and maintenance equipment annually. In FY 2014 and FY 2015, the repair program completed more than 2,700 work orders. In FY 2015, the in-house repair program resulted in—

- a 42 percent reduction in equipment repair cost, compared with FY 2006;
- significantly improved average turnaround repair time, from four weeks to nine days;
- increase in salvaging/reuse of parts;
- improved preventive maintenance to extend the life cycle of equipment; and
- capability to recycle waste materials.



The MCPS copier equipment and maintenance program, known as TeamWorks, purchases used copiers rather than new, and salvages certain components from retired copiers. In FY 2015, a total of 55 copiers were purchased used. They were refurbished and installed in MCPS offices and schools. During that same timeframe, 227 major component parts were salvaged from copiers before being recycled for plastic and metal.

Long-Term Goals

- Implement life-cycle-assessment procedures that follow International Organization for Standardization (ISO) 14040 standards, by 2020.
- Continue to refine school-facility-planning standards by implementing urban design concepts in suburban environments.
- Develop school-facility-planning standards that target compact core design and open-space preservation for each project.
- Pilot Net Zero energy building by 2022.
- Develop and implement Building Maintenance Plans for all schools, by 2024.
- Explore technological needs to achieve full mobile access and control of EMS systems.
- Explore automation of inspection programs to expedite work-order completion, by 2020.

Short-Term Goals

- Explore new design concepts that will improve educational delivery in key spaces such as STEM and TESOL classrooms, by 2017.
- Implement a facility software program that links project data spanning the design process through warranty and maintenance, by the end of 2016.
- Complete installation of FOG systems, as part of current WSSC compliance directive, by July 2016.
- Enable full web-based access and controls of EMS systems, by 2020.
- Perform continuous nonstructural maintenance to storm water facilities, including bio-retention facilities, ponds, swales, and green roofs at the intervals required by the Montgomery County Department of Environmental Protection.

Strategies

- Continue to work closely with county planners to develop projects consistent with the visions of community master plan goals.
- Continue to upgrade EMS systems.
- Provide FOG training for school-based building service staff.
- Provide Spill Prevention training to Department of Transportation and Division of Maintenance staff.
- Ensure that MCPS pumps out grease-abatement systems on a quarterly basis.
- Integrate systems with smart-meter technology, as provided by the local utility companies.

Transportation

Our progress

PROGRESS IN TRANSPORTATION since publication of the FY 2014 Environmental Sustainability Management Plan has focused on the following areas:

- Reducing carbon emissions
- Reducing operational costs

• Reducing Carbon Emissions

Currently, MCPS operates more than 1,200 buses, traveling more than 100,000 miles each day to transport our students. The Department of Transportation (DOT) continues to focus its efforts on reducing carbon emissions; environmental impacts, including air pollution; and operating costs, while promoting walking or riding bicycles to schools.

Since FY 2014, DOT has continued its effort to equip buses with catalytic converters. The catalytic converter is an emissions control device that converts toxic pollutants in exhaust gas to less-toxic pollutants by catalyzing a redox reaction (oxidation or reduction). At present, 62 percent of the school buses are equipped with catalytic converters, a significant increase from 42 percent in FY 2014.

DOT continues to make progress in preventing the release of diesel particulates into the atmosphere by installing diesel particulate filters on school buses. Diesel particulate filters have become the most effective technology to control diesel particulate emissions. In FY 2016, 85 percent of the buses have been successfully equipped with this system to stop a significant amount of soot from being emitted and reduce carbon emissions. In FY 2014, only 78 percent of the school buses were equipped with the diesel particulate filters.

School Years	# of Bus Routes	Miles Driven	# of Students Transported
2012–2013	1,126	18,912,870	98,583
2013–2014	1,134	19,087,870	100,000
2014–2015	1,148	19,237,356	101,949

• Reducing Operational Costs

During school year 2014–2015, MCPS school buses transported 101,949 students, with a total of 19,237,356 miles driven. Although there were 324,486 more annual miles driven in the 2014–2015 school year, compared with 2012–2013; the annual number of miles driven for each transported student dropped to 189 miles in the 2014–2015 school year, compared with 192 miles per transported student during 2012–2013. DOT is able to achieve this success by routing its buses efficiently, in order to maximize the number of students transported.

Long-Term Goals

- Achieve an overall bus fleet efficiency higher than eight miles per gallon (mpg), by 2025.
- Increase the efficiency (mpg/use) of the auxiliary non-bus fleet by 20 percent, by 2024.
- Reduce transportation greenhouse gas emissions by 20 percent, by 2025.

Short-Term Goals

- Install diesel particulate filters on all school buses, by 2019.
- Install catalytic converters on all school buses, by 2019.
- Develop a comprehensive systemwide replacement plan for the Small Vehicle Fleet, by 2019.

Strategies

- Collaborate with the county to increase the connectivity of sidewalks and bike paths to our schools and offices.
- Seek new technologies to incorporate in school buses, to reduce our carbon footprint.
- Purchase most fuel-efficient buses and vehicles, including partial zero emissions, hybrids, and flex-fuel vehicles, based on emerging markets of the latest fuel-efficient vehicle technology and its affordability.
- Develop a more convenient method to generate carpool trips.

Glossary

Greenhouse Gases—Gases such as carbon dioxide that trap the earth's heat, contributing to climate change (usually measured in tons).

MTCO2e—Equivalent metric tons of carbon dioxide, a standard measure for greenhouse gases.

Renewable Energy—Energy that comes from non-fossil-fuel-based sources that do not run out, such as wind and solar.

Fossil Fuels—Fuels that come from nonrenewable energy sources, such as gasoline and oil.

Geothermal—Geothermal energy is the heat from the earth.

Building Automation—Centralized, interlinked networks of digital hardware and software that monitor and control building environments.

Climate—A measurement in patterns of weather over long periods of time.

kBTU—A measurement of heat created by burning any material, with one BTU being the amount of heat necessary to raise the temperature of one pound of water by one degree Fahrenheit.

VOC—organic chemicals that have a high vapor pressure at ordinary room temperature.

LEED—Leadership in Energy & Environmental Design, is a green building certification program that recognizes best-in-class building strategies and practices.

Low-E—low thermal emissivity refers to a surface condition that emits low levels of radiant thermal (heat) energy.

Green Cleaning—using cleaning methods and products with environmentally friendly ingredients and procedures that are designed to preserve human health and environmental quality.

Green Procurement—Purchasing products and services that cause minimal adverse environmental impacts.

EUI—Energy use intensity expresses a building's energy use as a function of its size or other characteristics.

Acknowledgments

Development of this Plan would not have been possible without input from staff and principals across the school system.

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State Environmental Education Leadership:

A 50-YEAR LEGACY

MCPS has long supported and promoted school environmental education in Maryland. Our administrators and teachers were among the principal founders of the Maryland Association of Environmental and Outdoor Education. System leadership also plays an active role in the Governor's Partnership for Children in Nature—aimed at improving and expanding opportunities for children to experience, learn about, and play in the natural world.

Montgomery County Public Schools
Rockville, Maryland

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