PGCPS

Climate Change Action Plan (CCAP) Priority Recommendations

Prepared by the PGCPS Board of Education
Climate Change Action Plan Focus Work Group

Presented to the Prince George's County Board of Education, March 24, 2022
Unanimous Approval by Board of Education: April 28, 2022

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"I've always wanted to be a part of something bigger than myself that creates positive change. As a student and community member of Prince George's County, I hope that the Climate Change Action Plan will positively impact our schools and communities and inspire further action on a larger and stronger scale."-- *Nithin Gudderra, PGCPS Class of 2023, Oxon Hill High School and Work Group Member*

"The work ethic and information emerging from this Climate Change Action Plan Work Group is just incredible. When I look at the way PGCPS "focus" work groups of the Board of Education should operate, I point to this group as a best practice, from stakeholder engagement, to knowledge management and transparency. The CCAP website is top notch! I believe we will be successful in our climate action endeavors and we will lead the region, if not the nation, on climate action."-- *Sonya Williams, Vice-Chair & District 9 Board Member, PGCPS Board of Education, PGCPS Parent, PGCPS Alumni and Work Group Member*

Cover Page Image Credits: ***Kimberly Perez Toro, Suitland High School, 2022 PGCPS EcoAction Art Contest winner (11th-12th Grade, Central category),*** *Photos: PGCPS & Maryland Matters*

Message from the CEO

I am proud of the efforts and contributions of the PGCPS community to the Board of Education's Climate Change Action Plan Focus Work Group (CCAP). We are fortunate to have had students, staff, parents, community experts, and advocates in this groundbreaking initiative for PGCPS to join Prince George's County in our collective efforts to lessen the devastating impacts of the global climate crisis and be resilient to the impacts already occurring.

The overall recommendation to reduce our carbon footprint will lead to healthier buildings and transportation, cleaner air, healthier food, less waste, and operational cost-savings that will help PGCPS focus our limited resources more equitably and contribute to both better health outcomes and a safer future for our children.

PGCPS is very proud of our path to a greener future. The CCAP recommendations will build on these accomplishments:

- 141 Maryland Certified Green Schools (70% of PGCPS schools).
- Utilization of innovative building methods including, LEED certification, geothermal heat pumps, and solar panels.
- Conversion to energy saving LED light bulbs.
- An award winning Environmental Literacy & Outdoor Education curriculum.
- Green jobs of the future training in the Career & Technical Education (CTE) programs.
- Installation of nearly 60 green stormwater management facilities at PGCPS schools through the Clean Water Partnership program.
- Installation of the first electric bus charging station that will power PGCPS' first electric bus to begin transporting students later this year.

This plan is a critical component of *Transformation 2026 Equity & Excellence: PGCPS 2021-2026 Strategic Plan* and will contribute to measurable progress for critical success indicators in the Infrastructure & Operational Enhancements and Educational Excellence goal areas.

I want to thank the CCAP for their vision and for their extraordinary leadership in this endeavor as well as the many residents who shared feedback during the outstanding student-led town hall conversations that were held at critical points in the process.

I look forward to our partnership in promoting the innovative approaches endorsed in the plan and encourage the entire PGCPS community to be active participants in executing the plan.

Together we will achieve our objectives for a cleaner, healthier, and more resilient Prince George's County for the future! We are #PGCPSProud!

Dr. Monica E. Goldson
Chief Executive Officer

Message from the Work Group Co-Chairs

For the past year, we have been honored to serve as co-chairs of the PGCPS Board of Education Climate Change Action Plan Focus Work Group with a group of 22 diverse climate action experts representing PGCPS students, alumni, staff, parents, labor partners, community organizations, university representatives, and elected officials.

The growing impacts and costs of climate-related disasters are now being felt by communities everywhere, including in Prince George's County. PGCPS students and employees report climate change greatly impacts learning and working environments due to temperature extremes, flooded school grounds, natural disasters and the COVID-19 global health pandemic that has now disrupted two full years of our lives, in addition to the negative health consequences of air pollution. Students want the Board of Education and PGCPS administration to take immediate and real action on clean energy buildings and transportation to improve air quality, both indoors and out.

PGCPS students are loud and clear in their commitment to collaborative action. Students are already leading through Green Schools and Green Teams, launching composting programs, advocating for legislation at the County and State levels and creating seats at the table of future PGCPS Task Forces on climate science curriculum, food sourcing and all future implementation teams for the Climate Change Action Plan.

As parents of PGCPS students, we have heard this call and have acted accordingly. Failing to act would not only threaten our infrastructure and financial security, but also endanger human lives. Investing in our resilience today helps to ensure we can continue to invest in our community into the future and the solutions come with health benefits that will further benefit our students and improve their well-being.

The Climate Change Action Plan (CCAP or "Plan") reviews how PGCPS can make different decisions that will lessen the school system's impact on the environment and be more resilient to the negative effects of climate change. The Plan documents progress to date in advancing climate action across important topic areas. Building on this information, it presents strategies to reach a carbon-free, resilient PGCPS. We see clear opportunities in three broad areas: advancing internal systems in PGCPS operations so that our systems and processes are as climate-friendly as possible; reducing our contributions to greenhouse gas emissions; preparing PGCPS and the community for resiliency through impacts of a changing climate.

We want to acknowledge the hard work that PGCPS administrators, teachers, and staff put into our school system to educate the students, keep them safe and the action already under way to mitigate and adapt to climate change. We thank Chair of the Board Dr. Juanita Miller and CEO Dr. Monica Goldson for their support of the vision for this Work Group.

We are grateful to the members of the Focus Work Group and look forward to collaborating with PGCPS administration on successful implementation of the plan. We invite you to get to know all of these climate action leaders in the "Meet the Work Group Members" section of the plan.

Yours in Service,

Pamela Boozer-Strother, Board of Education Member, District 3
Joseph Jakuta, Climate Parents of Prince George's, Sierra Club Prince George's Group

A Vision for PGCPS: Zero Emission Public School System By 2040

On March, 1, 2021, the PGCPS Board of Education took the bold step of voting on a resolution declaring climate action goals for the school system and established the Climate Change Action Plan Focus Work Group to develop a plan to ensure success. PGCPS will meet the emission reduction targets outlined by the Intergovernmental Panel on Climate Change (IPCC):

- 100% Clean Sourced Electricity by 2030;
- 100% Clean Energy in all energy sectors, including heating, ventilation, air conditioning (HVAC), and cooking, by 2040;
- 100% Clean Transportation, by 2040;
- 100% Zero Food Waste by 2030; and
- 100% Zero Landfill Waste by 2040.

Transformation 2026 Equity & Excellence: PGCPS 2021-2026 Strategic Plan Alignment

PGCPS is one of the twenty largest school systems in the nation with nearly 132,000 students, 22,000 employees and an annual budget of $2.6 billion. PGCPS manages 208 educational facilities, plus many other administrative facilities. Our vision paints the image of a premier educational environment that values the rich uniqueness of who we are as we develop and equip life-long learners, leaders, empowered proponents of justice and prosperous communities to thrive in the global society. We are a culturally responsive district developing distinguished learners, leaders, voices of social justice, and advocates for humanity for the world of today, tomorrow, and beyond.

TABLE A: PGCPS Demographic Snapshot SY 2019-20

Student Group	Number	Percent
Latino – All Races	49,630	36.5%
Native American/Alaska Native	389	0.3%
Asian	3,645	2.7%
Black or African American	75,033	55.2%
Native Hawaiian/Pacific Islander	259	0.2%
White	5,308	3.9%
Two or More Races	1,728	1.3%
Total	**135,992**	**100.0%**
Male	69,345	51.0%
Female	66,617	49.0%
Special Education (SPED)	14,956	11%
Limited English Proficient (LEP)	28,552	21%
Free and Reduced Meals (FARMs)	86,336	63.5%

Source: FY20 PGCPS Enrollment on 9/30/19

The global COVID pandemic of 2020, leading into today, has ushered in a new era of unprecedented change. It revealed pockets of untapped creativity and innovation, exposed challenges in our traditional concepts of equity, gave rise to creative teaching and learning models, and fundamentally transformed education paradigms.

The demand for equity and innovation in education is more significant now than ever before. Equity in PGCPS is ensuring each student has what they need to receive a student-centered education that empowers them to be active participants in their learning experience and contributors in creating and sustaining thriving communities.

PGCPS core values articulate our key beliefs about students, learning, stakeholder responsibility, and the elements necessary to achieve equity and excellence in education:

1. Students are our priority, and all students can achieve at high academic levels.
2. Families, students, and educators share the responsibility for student success.

3. High expectations inspire high performance.
4. All staff share the responsibility for a safe and supportive school environment contributing to excellence in education.
5. The support of everyone in our community is essential to the success of our schools and students, and this success enriches our community.
6. Continuous improvement in teaching, leadership and accountability is the key to our destiny.

PGCPS's vision, mission and core values create the foundation for our Climate Change Action Plan. As of May 2021, 131 of the schools in the systems have been certified under the Green School program. These traits give PGCPS a great opportunity to make a meaningful difference in terms of the climate impact it has as it undertakes its mission to educate the large diverse student body in Prince George's County.

"Climate action is about equity. It is the next broad paradigm that the people of Prince George's County can come together in oneness to benefit our children. All children should have equal access to a healthy environment. It is a fundamental right." -- *Dr. Alvin Thornton, Former Chair of the PGCPS Board of Education & Chair of the Thornton Commission on Education Finance, Equity and Excellence*

The CCAP supports the strategic imperatives of the PGCPS 2021-2026 Strategic Plan, including:

- Infrastructure & Operational Enhancements: Improving Operational Efficiency & Realizing Operational Excellence
    - Facilities Maintenance Efficiency
    - Facilities Maintenance Satisfaction
    - Learning Environment Satisfaction
    - Facilities Maintenance Quality
    - Facilities Modernization
    - Workforce Collaboration
    - Workforce Innovation
- Academic Innovation
    - Culturally responsive instructional materials
    - Culturally responsive instructional practices
    - Co-curricular activity participation
    - Extra-curricular activity participation
    - Family Engagement Opportunities
    - Family Engagement Participation

County, State, Regional, Global & Education Sector Alignments

Climate action is finally a priority of states, cities, counties and school systems throughout the United States and in many other countries. Prince George's County Board of Education has the opportunity to take action in regards to its operations with the support of government and Non-Governmental Organization (NGO) partners.

Prince George's County Council established the Prince George's County Climate Action Commission in the summer of 2020 to develop a community-wide climate action plan to prepare for, and build resilience, to regional climate change impacts and to set and achieve climate stabilization goals. PGCPS employee Donald Belle, Environmental Programs Leader & Teacher

Environmental Outreach Educator with the William S. Schmidt Outdoor Environmental Education Center, represents PGCPS on this Commission that created the County's Climate Action Plan. In the fall of 2021 County Executive Angela Alsobrooks also signed the "We Are Still In" pledge to meet The Paris Agreement, the international treaty on climate change. The Commission completed the draft of the Prince George's County Climate Action Plan October of 2021, and after a 30-day public comment period, the Commission's community-wide climate action plan was officially delivered to County Council on January 15,2022.

"This is an exciting opportunity! I feel so privileged to be a part of the Work Group and to feel the genuine desire to make much needed changes to secure our future. I am thankful for the PGCPS Board of Education and the committee members' leadership, particularly our student participants who are taking this issue and running with it. Climate change is a real issue that we must all tackle by working together, which makes this space so important. The County Council is a dedicated partner to PGCPS in implementing the recommendations in the plan."--*Deni Taveras, Prince George's County Council Member, District 2 and Work Group Member*

In addition to the Prince George's County Climate Action Commission's Climate Action Plan January 2022, PGCPS is committed to contributing to the goals and recommendations established in the:

- Maryland General Assembly Climate Solutions Now Act of 2022
- Metropolitan Washington Council of Governments 2030 Climate and Energy Action Plan
- State of Maryland 2030 Greenhouse Gas Reduction Act Plan
- US Department of Education Climate Adaptation Plan September 2021
- Aspen Institute K12 Climate Action Plan 2021
- Sierra Club Climate Parents 100% Clean Energy School Districts Campaign

PGCPS Climate Action Opportunities

Actionable, cost-effective solutions currently exist to reduce energy used by buildings and transportation managed by PGCPS, generate renewable onsite power at buildings, replace infrastructure and vehicles with zero emissions alternatives, and reduce food-related greenhouse gas emissions, among other solutions. These solutions also will become even more readily available and cost-effective in the ensuing years. These solutions also have ancillary benefits from the possibility of being used to train future generations of students on the latest technologies, to creating grid independent community emergency locations, to reducing the impacts of air pollution and unhealthy food, both of which impair students' education outcomes. PGCPS can have a particularly meaningful impact due to the large number of buildings it owns, vehicles it runs, and students it educates, as well as through the example it sets.

Sources of Data Referenced

- Intergovernmental Panel on Climate Change (IPCC) https://www.ipcc.ch/
- Transformation 2026 Equity & Excellence: PGCPS 2021-2026 Strategic Plan https://www.pgcps.org/globalassets/offices/accountability/docs---accountability/sprm/2021-2026-equity-strategic-plan.pdf
- Prince George's County Climate Action Commission. "Climate Action Plan." January 2022. https://www.princegeorgescountymd.gov/3748/Climate-Change
- The Paris Agreement https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
- Maryland General Assembly Climate Solutions Now Act of 2022, https://mgaleg.maryland.gov/2022RS/bills/sb/sb0528E.pdf

- Metropolitan Washington Council of Governments 2030 Climate and Energy Action Plan https://www.mwcog.org/documents/2020/11/18/metropolitan-washington-2030-climate-and-energy-action-plan/
- State of Maryland 2030 Greenhouse Gas Reduction Act Plan https://mde.maryland.gov/programs/Air/ClimateChange/Pages/Greenhouse-Gas-Emissions-Reduction-Act-(GGRA)-Plan.aspx
- US Department of Education Climate Adaptation Plan September 2021 https://www.sustainability.gov/pdfs/ed-2021-cap.pdf
- Aspen Institute K12 Climate Action Plan 2021 https://www.k12climateaction.org/blog/climate-action-plan-2021
- Sierra Club Climate Parents 100% Clean Energy School Districts Campaign https://www.sierraclub.org/climate-parents

Understanding the Climate Change Action Plan

The PGCPS CCAP is a call to action! It outlines the transformational commitments that are needed to guide our behavior over the next five years and requires every PGCPS stakeholder to change the way we live, work, learn and play.

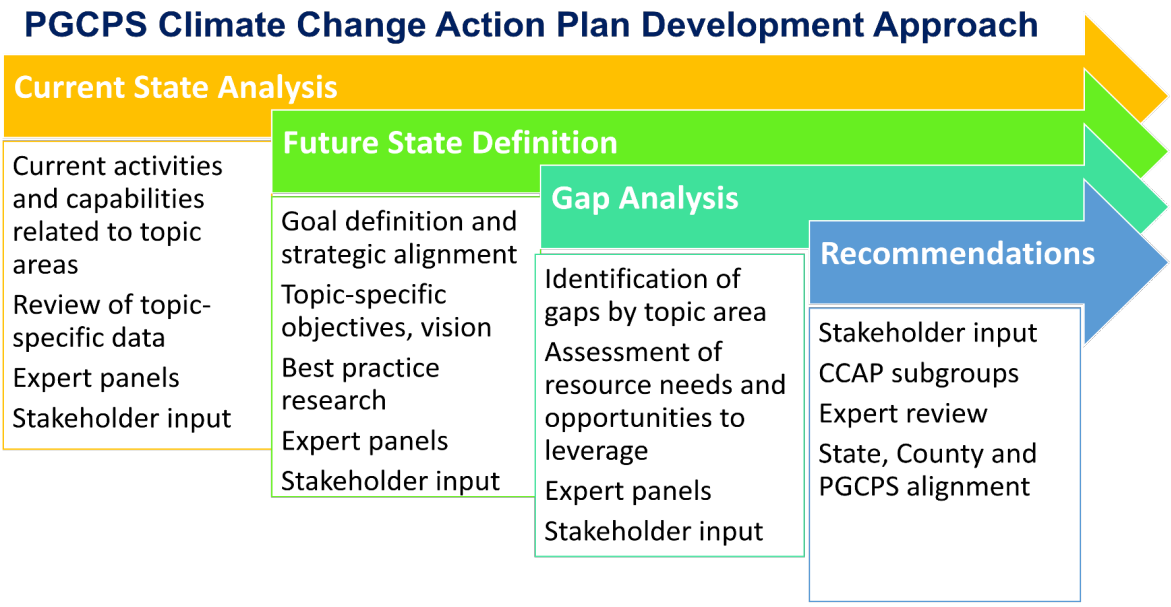
Approach

The approach to developing a comprehensive and actionable plan around achieving significant environmental metrics was three-fold:

1) Leverage the expertise and experience of current initiatives for growth and economies of scale;
2) Integrate best practices and lessons learned from Prince George's County as well as other locations; and
3) Engage and listen to our community early and often, starting with our students and staff.

We used this approach by focusing on one topic at a time over the 10-month period.

As the graphic below illustrates, the working group took time to recognize how far we have come in defining "current state" based on the scope of this effort. This included the recognition of successes, challenges and partners across the seven topic areas. We defined our desired end state with goals, metrics and a vision of success. We used data, expert panels and stakeholder feedback across all phases to identify gaps and develop short, medium and long-term recommendations that drive successful achievement of carbon emission reduction by 2030 and 2040 for PGCPS. Overall, the CCAP approach was used to develop a climate action framework and business case for PGCPS. Resources, information and technology will evolve over time and this document should reflect adjustments and changes as appropriate.



Guiding Principles

The PGCPS CCAP Focus Work Group was guided by principles that set clear expectations on the purpose, process, and results. These principles reflected the Focus Work Group's commitment to environmental quality, educational opportunity, and equity. They guided decision making, stakeholder engagement, and prioritization of actions. They were discussed at the introductory meeting and adopted on June 23, 2021. *See the expanded Guiding Principles in the Climate Change Action Plan Focus Work Group Members, Methodology & Timeline section.*

#1 We believe in broad Work Group member buy in.
#2 We believe in science.
#3 We believe in transparency, equity, and inclusivity.
#4 We believe in accountability.

Equity

Each of the plan's Priority Recommendations includes an equity component, with the goals of understanding current disparities, promoting inclusive involvement in the implementation process, and advancing equitable outcomes. To ensure such equitable processes and outcomes, it will be vital to develop clear metrics for tracking progress and ensuring transparency. PGCPS has an opportunity to exemplify equity in action by anticipating, assessing, and preventing potential adverse consequences of proposed actions on underserved and overburdened residents. This may be done by:

- Identifying and engaging all stakeholders, especially those most adversely affected;

- Examining factors that may be causing or perpetuating racial inequities associated with the climate issues;
- Clarifying actions to reduce disparities or discrimination and advancing positive impact and equitable opportunities;
- Establishing success indicators, evaluation measures, and ongoing stakeholder engagement.

To achieve transformative impact, PGCPS cannot go it alone. We must collaborate with the Maryland State Department of Education (MSDE), County leadership, PGCPS students, parents and staff, PGCPS alumni, advocacy groups and local organizations in partnership towards systemic change. Only together can we work to envision, plan, and build an inclusive, prosperous, and resilient future.

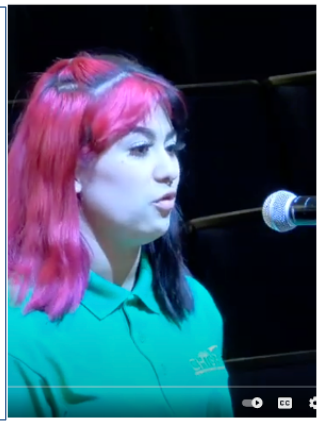
"We see students every day demanding climate action at rallies, in the halls of government buildings, and in their classrooms. They see how climate change and pollution is affecting their health and the well-being of their communities. My hope is that this Climate Change Action Plan will enable Prince George's County schools to take collective action in reducing their carbon footprint in an equitable and just manner, in order to help students and their communities thrive and reach their fullest potential."--*Ramón Palencia-Calvo, Deputy Executive Director, Maryland League of Conservation Voters, Chispa Maryland Director and Work Group Member*

Priority Recommendations: Taking Action for a Carbon Neutral Future

PGCPS believes taking urgent action to combat climate change is critical for both our students' future and to protect our community from the impacts of a changing climate. The CCAP is also a call to action to empower our students, staff, and administration to work as partners with our County and State to bring about transformational changes and help create a future where we all share the benefits of healthy air, clean water, job opportunities, and safe places to live, work, and play.

Taking Action is the heart of the PGCPS CCAP. The following **8 Priority Recommendations** are outlined in this section and intended as only the beginning to our school system's transition to a low carbon and climate resilient future.

Julisa Mejia, High Point HS Class of 2023, and Angel Nwadibia and Leena Mohamed, PGCPS Class of 2020 Eleanor Roosevelt HS, testify for PGCPS to prioritize climate action at the January 28, 2020, Budget Hearing. This testimony moved the Board of Education to commit to a Focus Work Group on Climate Action.



- ⇒ **#1: Support Environmental Justice Through Climate Curriculum, Training, and Partnerships**
- ⇒ **#2: Reduce Carbon Footprint from PGCPS Buildings**
- ⇒ **#3: Commit to Renewable Energy Sources for a Net Zero Emissions Future**
- ⇒ **#4: Commit to Low Carbon School Transportation**
- ⇒ **#5: Reduce Food Waste and Grow Climate-Friendly Food**
- ⇒ **#6: Commit to Sustainable Materials Management and Procurement**
- ⇒ **#7: Commit to Climate Resilient Land Management**
- ⇒ **#8: Lead by Example to Support Transformational Change**

For an actionable plan, the CCAP has identified the following three climate action plan components as applicable and critical to achieving the plan's Priority Recommendations:

- **Operational**: Action to bring about functional and systematic change within our school system to support implementation of the CCEP and transition to a carbon neutral future.
- **Mitigation**: Action to reduce our school system's greenhouse gas emissions and overall carbon footprint.
- **Adaptation**: Action to respond to and prepare our school system for the impacts of climate change.

All of **8 Priority Recommendations** – as well as the CCAP broader strategies and core values as discussed in the narrative, are also designed to align and support the climate goals of our County's Climate Action Plan, State of Maryland's 2030 Greenhouse Gas Emissions Reduction Act Plan, and the Metropolitan Council of Government regional climate action strategies as referenced above.

Priority Recommendation #1: Support Environmental Justice Through Climate Curriculum, Training, and Partnerships

A comprehensive environmental literacy program with pillars in environmental justice and climate awareness will transform the way PGCPS teachers and students understand climate change and environmental justice issues while developing essential knowledge and skills around global topics. This will be a critical initiative for PGCPS and educators to teach future generations about how our environmental choices have shaped our past and will shape our future. Students will gain knowledge and build skills at fulfilling the requirements of green jobs and support the transition to a low-carbon green economy. Ultimately, the implementation of recommendations in this section will empower PGCPS students and teachers to explore locally relevant solutions to pressing global issues, increase awareness and critical thinking, and inspire and develop future environmental leaders.

Priority Recommendation #1: Environmental Justice Through Climate Curriculum, Training, and Partnerships outlines 6 Operational Actions considered critical to supporting the goals of this recommendation. No direct Mitigation or Adaptation Actions are outlined under this recommendation.

"Every student has the right to learn about issues that will affect how they live, play, work, and learn. Climate change is one of those issues. They have the right to be informed, contribute to solutions, and influence the direction of their community. Solutions to the Climate change emergency will require new technology, new infrastructure, new career pathways, and new ways of thinking. It is our obligation to put students in the best position to take advantage of opportunities in establishing and emerging fields. This is our opportunity to support the current and next generation of community leaders seeking to establish climate and environmental justice while protecting communities that are disproportionately impacted by the challenges of climate change."-- *Donald Belle, PGCPS Environmental Programs Leader & Teacher Environmental Outreach Educator with the William S. Schmidt Outdoor Environmental Education Center*

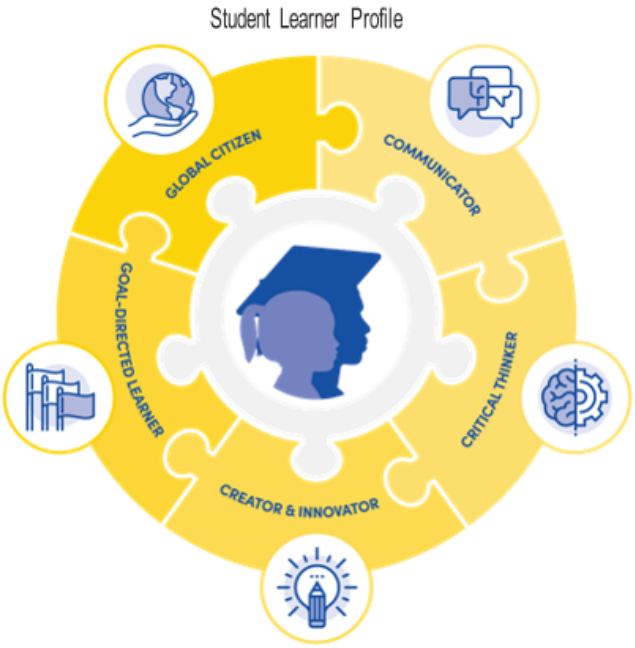
Operational Actions

O1 Create Climate Curriculum and Environmental Justice Work Group (CCEJWG)

The purpose of the CCEJWG is to review and prioritize current curriculum in environmental literacy, science and social justice and then adapt and develop, as necessary, new formal and hands-on learning to enhance climate awareness across all grades. The curriculum and related materials will be made available to all teachers as an open education resource for access and adaptation.

Implementation Steps:

A. The CCEJWG should be made up of student leaders, PGCPS staff from the Division of Academics, the Office of Equity & Excellence, educators at the William S. Schmidt Outdoor Environmental Education Center, labor partner representatives, educators, and administrators. (O1.Education.A)
B. The CCEJWG should develop a set of “Environmental Ethics" principles to set the guiding principles and values that articulate the expected behaviors and norms between teachers, staff, students and the school environment, including operations and maintenance. Upon completion these principles should be put into practice and overseen by the PGCPS Office of Equity & Excellence.(O1.Education.B)



O2 Launch Annual Climate Ready Leadership Summit

This annual Summit will bring together environmental leaders to discuss the most pressing environmental issues and how to accomplish our climate, resilience, and justice goals. It will give an opportunity for students from throughout the county to meet each other, collaborate, and learn about the environmental concerns of the day.

Implementation Steps:

A. Host a Climate Ready leadership summit timed with annual Earth Month (April) activities.
    a. The Summit will be open to all interested students, however, special invitations will be made to green skills CTE program participants.
    b. If recommendation O6.Education.D is implemented this can be an opportunity to introduce the project to high school juniors and allow high school seniors to showcase their work.
    c. A portion of the leadership summit should involve updates from PGCPS staff on progress implementing this Climate Change Action Plan (O2.Education.A)

O3 Enhance Access to Climate Technology

Part of the solutions to adapting to and mitigating the impacts of climate change will involve use of technology. Some examples are examining building energy data to make capital decisions or maintenance choices, reviewing energy data from solar panels or batteries for the same purposes, learning about hydrology to make the most valuable stormwater management decisions, and learning how to use, maintain, and repair the technologies that will be in use through the careers of current students.

Implementation Steps:

A. Continue investing in and expand upon CTE programs that rely on current and future green technologies such as solar panels, heat pumps, and electric buses. (O3.Education.A)

B. Develop dashboards for new energy and waste systems recommended throughout this document and make them available for examination by students. (O3.Education.B)
C. Create modules in appropriate STEM classes that rely on available dashboards and examination of current green technology. (O3.Education.C)

"My passion around Energy Management/Stewardship and Climate Sustainability/Resiliency, along with the opportunity to support and serve our PGCPS students who wish to pursue energy and environmental careers, influenced my decision to participate in this Work Group. Additionally, I envisioned that this Work Group would create a model for other school districts."--
Jamee Alston, Management Analyst, Division of Supporting Services, Department of Building Services, PGCPS and Work Group Member

O4 Enhance CTE Program to Further Incorporate "Green" Skills and Job Readiness

We do not yet know how fast the expansion of new green technologies and methods will be yet, but we do know they are coming. PGCPS itself is already investing in solar panels, geothermal heat pumps, smart lighting and other energy systems, and is beginning to invest in electric vehicles. There are also more nascent technologies such as onsite battery storage and Vehicle-to-Grid (V2G) buses that are likely to become more commonplace. Though not as technologically oriented, there are also new techniques for waste management, land management, and stormwater management that are becoming more widely accepted and will be necessary to implement in light of climate change. Also increasingly there is a computer data management element to all of these sectors, whether examining data to make determinations for preventative maintenance, having systems that are part of the Internet of Things (IoT), or troubleshooting modern technologies.

Implementation Steps:

A. Expand the number of enrolled students in the following programs:
    a. Environment, Agriculture & Natural Resources
    b. Construction and Development with a focus on environmental and climate change issues
B. Add programs in the following subject areas:
    a. Energy Management with a focus on renewable energy;
    b. Farm to Cafeteria method; and
    c. Construction Design utilizing Recycled Materials. (O4.Education.B)
C. Promote the green programs being implemented at CTE Hubs:
    a. Transportation Technology;
    b. Environment, Agriculture & Natural Resources; and
    c. Information, Technology and Computer Science - Engineering. (O4.Education.C)
D. Provide an estimated investment of $1,450,000 in additional funding for the CTE green skills program. (O4.Education.D)
E. Integrate climate change topics into CTE education programming (e.g. Health effects and disparities in the Health and Biosciences Program, security concerns in the JROTC Program, electric vehicles in the Transportation Technologies Program) (O4.Education.E)

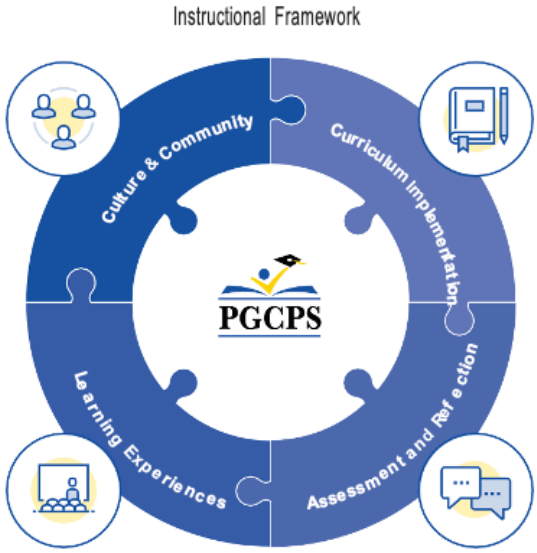
O5 Build New Climate Partnerships with eNGOs and Businesses

Development of partnerships with outside environmental non-governmental organizations (eNGOs) that focus on the environment, and businesses that impact or improve the environment, can augment the learning opportunities for students. This can be particularly important because the solutions to mitigate and adapt to climate change are fast changing and eNGOs and businesses can provide students with more recent information than a curriculum that can be developed on a time lag. These partnerships can also allow students to have a pipeline to internships or apprenticeship programs upon graduating that could benefit students on a variety of career paths. We have already seen successful partnerships being developed with energy production companies and stormwater management NGOs at PGCPS. Continuing existing and developing new partnerships is a vital benefit for students to receive an augmented environmental education.

Implementation Steps:

A. Inventory existing educational partnerships with eNGOs and businesses. (O5.Education.A)
B. Collaborate with the Office of Community Partnerships on identifying new partners. (O5.Education.B)
C. Continue to encourage school-based staff to identify partnerships in their geographic area. (O
D. 5.Education.C)

O6 Incorporate Climate and Environmental Justice Curriculum into Learning Standards and Benchmarks



While teaching the subject of climate change in schools can be challenging it is vital for students regardless of their future career and education paths to understand. Learning how to measure individual and institutional carbon footprints is critical for current and future decision-making in life and career. It is also important to teach so that students, as they grow up, are not disillusioned from not learning about one of the most important, salient issues of the day. In the past, climate change was often thought of as a subject that was relegated to an earth science class, but just as climate change will impact nearly every aspect of our lives, it can touch on every educational subject area. Additionally, understanding the causes and solutions to climate change often expose historical environmental injustices, so this education needs to be conducted with an environmental justice lens. Learning about climate change in such a holistic fashion can also benefit students as they go out into their careers since the solutions are often cross disciplinary. Career Technical Education (CTE) provides students of all ages with the academic and technical skills, career-oriented exposure, and the knowledge and training necessary to succeed in future careers and to become lifelong learners as well.

Implementation Steps:

A. Conduct curriculum walkthroughs to assess if 1) current contact area curriculum is already addressing climate change and environmental justice; 2) materials and how many classroom hours are already prescribed in the current curriculum. (O6.Education.A)
B. Following the walkthroughs discuss with the leadership in Curriculum and Instruction as to the appropriate amount or hours for students to engage in climate and environmental justice curriculum.(O6.Education.B)
C. Conduct system-wide training workshops for educators. This will begin by training Climate Curriculum Ambassadors, educators, facility managers and other personnel who will receive in depth training on the new climate and environmental justice. The Climate Curriculum Ambassadors would then take the information back to their schools (or possibly to multiple elementary schools). (O6.Education.C)
D. Ensure administrator buy-in on the new climate and environmental justice curriculum. (O6.Education.D)
E. Develop an optional cross-disciplinary capstone project for seniors that encourages students to use what they learned in O6.Education.A and use that information to develop a solution to a challenge of climate mitigation or adaptation. (O6.Education)

Recommendation Number	Operational Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
O1 Education	Create Climate Curriculum and Environmental Justice Work Group (CCEJWG)	◉	◉	◉	◉	1-3
O2 Education	Launch Annual Climate Ready Leadership Summit	◉	◒	◉	◉	1-2
O3 Education	Enhance Access to Climate Technology	◉	◒	◉	◒	2-5
O4 Education	Enhance CTE Program to Further Incorporate “Green” Skills and Job Readiness	◉	◉	◉	◉	2-5
O5 Education	Build New Climate Partnerships with eNGOs and Businesses	◉	◒	◉	◉	3-5
O6 Education	Incorporate Climate and Environmental Justice Curriculum into Learning Standards and Benchmarks	◉	◉	◉	◉	3-5

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Equity Considerations

The CCAP presents a vision that schools can create more equitable communities:

- Climate curriculum encourages reflective practice and builds cultural awareness in students and adults.
- Climate curriculum can be designed using multiple pathways and include meaningful participation.

The CCAP is putting equity at the center of implementation. PGCPS will invest in career development opportunities, including climate-related professional development for teachers and staff, augmented offerings for workforce training at Prince George's Community College (PGCC) with special focus on retraining of displaced workers, climate resilience summer youth employment programs in collaboration with County government, and an apprenticeship program that does not require higher education degrees for entry-level positions.

- We will ensure the curriculum is available for all grade levels.
- We will integrate local case studies into our curriculum that help us learn from our history and demonstrate environmental justice issues and outcomes.

Labor Partner Considerations

As discussed earlier, some subject areas already touch on climate change and environmental justice issues in the curriculum. Some educators outside of the traditional science classes have begun to take on this subject matter. However there may be reticent from some educators on this new curriculum. It is vital that unions representing teachers and administrators play an active role in the creation of metrics used to evaluate compliance with the curriculum.

Implementation Team

Lead Agency

The Department of Curriculum and Instruction will be the lead agency with regards to this effort.

Collaborative Partners

The Department of Career and Technical Education Programs will be required to implement recommendation O5 Curriculum on enhancing the CTE program to further incorporate "green" skills and job readiness.

The Office of Community Partnerships will be required to implement recommendation O7 Training on building new climate partnerships with environmental NGOs and businesses.

The Department of Monitoring and Accountability will be required to implement recommendation O3 Curriculum on creating and implementing "Environmental Ethics" principles and norms for all students, teachers and staff to adhere to within PGCPS.

William S. Schmidt Outdoor Environmental Education Center will continue to be a vital component of PGCPS experiential learning curriculum.

Measurement and Tracking

O1 Create Climate Curriculum and Environmental Justice Work Group (CCEJWG)
1. Creation of the work group and completion of its tasks.

O2 Launch Annual Climate Ready Leadership Summit
1. Number of years with Climate Ready Leadership Summits.

O3 Enhanced Access to Climate Technology
1. Number of students accessing various climate technologies.

O4 Enhance CTE Program to Further Incorporate "Green" Skills and Job Readiness
1. The number of students enrolled in green skill CTE programs.
2. The number of green skill CTE programs.
3. Job placement percentages for students enrolled in green skill CTE programs.

O5 Build New Climate Partnerships with eNGOs and Businesses
1. Number of outside partnerships.

O6 Incorporate Climate Curriculum into Learning Standards and Benchmarks
1. Number of teachers trained in new climate and environmental justice curriculum
2. Number of Climate Ambassadors trained within PGCPS
3. Environmental literacy scores increase by 5% or more each year
4. Percentage of environmental justice and climate curriculum integrated into all grade levels.

Helpful Resources

- PGCPS William S. Schmidt Outdoor Environmental Education Center, Environmental Literacy and Outdoor Education Annual Report, 2021 https://drive.google.com/file/d/1LPK-DbgRV8IKZsUyKsId55mscrYXQWDK/view
- William S. Schmidt Outdoor Environmental Education Center renovation plans, September 2020 https://go.boarddocs.com/mabe/pgcps/Board.nsf/files/C54RJG6E2C04/$file/Schmidt%20Presentation%20-%202020%200921%20redux.pdf
- William S. Schmidt Outdoor Environmental Education Center website https://offices.pgcps.org/williamschmidt/
- PGCPS Graduation Requirements https://www.pgcps.org/offices/curriculum-and-instruction/graduation-requirements
- The Future of CTE in PGCPS presentation to Board of Education Climate Change Action Plan Focus Work Group, July 2021 https://go.boarddocs.com/mabe/pgcps/Board.nsf/files/CCBKHG51F1D6/$file/The%20Future_%20CTE%20in%20PGCPS%20(1).pdf
- PGCPS Career & Technical Education (CTE) website https://www.pgcps.org/offices/career-and-technical-education

Current PGCPS Highlights: Empowering Students

PGCPS is already leading the way on a greener future. We continue to lead the state with the highest number of Maryland Green Schools certifications. PGCPS has a total of 141 Green Schools, nearly 70 percent of all schools systemwide and more than 20 percent of the 672 active Maryland Green Schools.

PGCPS Career Technical Education (CTE) provides students of all ages with the academic and technical skills, career-oriented exposure, and the knowledge and training necessary to succeed in future careers and to become lifelong learners. CTE gives high school students the chance to get a head start on preparing for college and careers, helping students gain the skills, technical knowledge, academic foundation, and real-world experiences they need to prepare for high-skill, high-demand, and high-wage careers. In CTE programs, students learn how core school subjects like math, science, and writing are used in real-life. CTE students participate in hands-on training in their chosen program and gain real-world experience through job shadows and internships.

The William S. Schmidt Outdoor Environmental Education Center is an academic center that provides students at many grade levels with a meaningful outdoor experience that enhances as well as reinforces skills learned in the classroom. The 450.6 acre campus is the center piece for environmental education for PGCPS. A major focus of the Schmidt Center program is the fifth grade overnight experiential field trip. All schools are provided with the opportunity to visit either the Schmidt Center or Hard Bargain Farm (Alice Ferguson Foundation). Activities range from Stream Ecology and Orienteering to Team Building and Problem Solving, to name a few. These activities align to Common Core, STEM (Science, Technology, Engineering and Mathematics) and Environmental Literacy.

The Schmidt Center is working on expanding learning opportunities in environmental science. The center is the site for the Envirothon, as well as promoting activities such as Bridging the Watershed, school ecology clubs, using rain barrels, and building school gardens.

Photo credits: PGCPS

Priority Recommendation #2: Reduce Carbon Footprint from PGCPS Buildings

These recommendations focus on the priority operational changes for all 255 PGCPS buildings and approaches to constructing new buildings. While student buildings have traditionally been the focus of the Educational Facilities Master Plan (EFMP), the Climate Change Action Plan includes administrative buildings and transportation buildings as the central office staff work in the oldest and most energy inefficient buildings in the system.

Priority Recommendation #2: Reduce Carbon Footprint from PGCPS Buildings outlines 4 Operational Actions, 5 Mitigation Actions, and 1 Adaptation Action considered critical to supporting the goals of this recommendation.

> **"Coming from the Capital Improvement office, we see the challenges of construction projects from a number of angles including cost, permit approvals, sustainability, energy efficiency and more. I pray that this process of developing a plan to implement districtwide with individuals in all facets of our operations will change the way we think about our projects and operations. The public deserves to know that we are doing everything possible to be good stewards of our resources and the children of this system deserve to be able to learn in the best environment possible."--** *Dawn Holton, A/E Design Supervisor/Senior Mechanical Engineer, PGCPS Department of Capital Programs, PGCPS Alumni and Work Group Member*

Operational Actions

O1 Require Private Partners to Participate In All Rebates and Other Appropriate Financial Programs

While investments in efficient buildings can pay for themselves, the high upfront costs can limit the number of buildings improved or replaced, and can have other short-term negative budget implications. Due to this, it is vital that all parties, especially contractors and other private partners, pursue all appropriate grants, market programs, and other financial programs in partnership with PGCPS.

Implementation Steps:

A. Include language in all RFPs that contractors utilize all grants and other appropriate alternative financing options that lead to reduced emissions and/or increased resilience. See Mitigation and Adaptation sections for listings of potential funding streams. (O1.Buildings.A)

O2 Collect and Disseminate Data on Building Energy Performance

Understanding energy use in both new and old buildings is important to evaluate successful projects, avoid the decisions that lead to problematic projects, and discover problems with energy systems that require maintenance, all of which will save energy and money. Additionally, buildings performance can be used to make decisions as to which buildings may need to be retrofitted or replaced earlier. Access to building performance data can also provide learning opportunities for PGCPS students, in particular in the CTE program and some STEM classes.

Implementation Steps:

A. Initiate an RFP to install energy monitoring systems in all PGCPS buildings that currently lack the systems and include energy monitoring systems in new buildings. The data must be centrally viewed by PGCPS energy analyst staff. The monitoring systems must collect granular enough submetering to assist staff in prioritizing building maintenance needs. This recommendation should be taken in tandem with recommendation M1.Buildings.A. (O2.Buildings.A)
B. Rely on building performance data collected through these recommendation as an additional factor for determining retrofit and replacement cycling schedules in the PGCPS Educational Facilities Master Plan (EFMP) FY22 Amendments (O2.Buildings.B)
C. Provide access to energy performance dashboards to, at a minimum, students in classroom settings, and preferably to the public as large, to allow for learning and understanding of PGCPS energy use. (O2.Buildings.C)
D. Examine use of the Maryland Energy Administration (MEA) Decarbonizing Public Schools Pilot Program to defray the costs of this effort. (O2.Buildings.D)

O3 Build Staff Capacity in Building Maintenance and Management

Given increased funds in going into research and development at the U.S. Department of Energy, new technologies may become available, both physical and digital, that can be used cost-effectively to reduce energy use or replace fossil-fuel use with zero emission alternatives in buildings. Appropriate staffing levels are needed to reduce maintenance backlogs that lead to problems with energy using equipment, eventually costing PGCPS more money and wasting more energy.

Implementation Steps:

A. Allow engineering staff to engage in continual research of new energy efficient building automation and monitoring systems and other technologies through:
    a. Continued support of PGCPS engineering staff in staff development efforts and access to opportunities to learn about new technologies;
    b. Maintaining one property that is underutilized as a “test bed” for PGCPS to evaluate new technologies in an environment that does not affect students or staff. (O3.Buildings.A).
B. Shift maintenance staffing to a ten to one ratio of buildings per technician to increase viability for maintaining building efficiency and ensure that maintenance staff have adequate time to properly conduct HVAC inspections, boiler and hot water heater tunings, and other regular maintenance. (O3.Buildings.B)
C. Recreate the position of “building engineer” and have a minimum of one building engineer per every three elementary schools, one per every upper level school, and an evaluation of the appropriate staffing for regional programs. (O3.Building.C)

O4 Consolidate PGCPS Administration/Central Office Staff

PGCPS administrative and central office staff currently work in more than 17 buildings throughout the county. These buildings are often older schools that were not designed to be office space, are inefficient relative to the entire building stock, and have additional problems such as poor indoor air that had led to the buildings being taken out of use as schools. Consolidating to a new central administrative building would create a more productive environment for PGCPS staff and result in a building that is more efficient and healthier to work in.

Implementation Steps:

A. Consolidate PGCPS administrative staff in one centralized space, preferably in a location centrally located in Prince George's County and use an efficient building specifically designed for office functions. (O4.Buildings.A)
B. Cease using the existing inefficient office buildings and use the properties for replacement buildings or other suitable purposes, with the possible exception of keeping one inefficient building solely for use as a "test bed" under recommendation O3.Buildings.A. (O4.Buildings.B)

Mitigation Actions

M1 Perform Comprehensive Energy Audit All Existing Buildings and Rely on Data for EFMP Cycles

Having a current assessment of the approximately 255 buildings under PGCPS ownership will provide several benefits. First, targeted maintenance and repair efforts that could lead to increased energy savings can be undertaken. Secondly, small scale improvements and retrofits can be undertaken to improve energy efficiency in a cost effective and methodical manner. Finally, this data can play a crucial role in evaluating both where buildings should be placed in the PGCPS Educational Facilities Master Plan (EFMP) FY22 Amendments cycles and whether a retrofit or replacement is warranted in terms of energy savings.

Implementation Steps:

A. Evaluate the use of an ESCO to conduct a system-wide energy audit, make energy efficiency improvements, and implement the recommendation O4.Buildings:
    a. If the approach of using an ESCO is determined to be infeasible, not cost effective, or otherwise unviable, initiate an RFP to conduct a system-wide energy audit.
    b. If the approach of using an ESCO is determined to be appropriate enter in agreement for an energy audit, building energy improvements, and system monitoring. (M1.Buildings.A)
B. Institute a new criteria in the EFMP process to consider the future lifetime energy use in retrofit and replacement decisions. (M1.Buildings.B)
C. Upon completion and evaluation of the audit, pursue economically reasonable lighting, building envelope, insulation, window replacement, and other efficiency projections. (M1.Buildings.C)

M2 Move Towards Ultra Efficient Fossil-Fuel Free/Net Zero Ready for All New Construction

The Building Work Group of the Maryland Commission on Climate Change conducted cost analyses of new buildings. While schools were not directly analyzed, it was found that for commercial buildings, the closest equivalent, that heat pumps were typically the most economical long-term choice for HVAC systems. PGCPS's own work analyzing thirty year total cost of operations of its infrastructure as required by the Maryland Interagency on School Construction (IAC) has come to the same conclusion.

Additionally, in the medium term, it is expected rooftop solar costs will come down further and there may be increased funds available to offset costs for schools. Setting up new buildings to be able to install solar panels at a later date will future proof PGCPS investments.

Efficient buildings are also important since even fossil fuel free buildings will waste more energy if the building envelope and internal spaces are not developed with efficiency in mind. Energy efficient buildings can also help lower the long-term costs from operations to ease financial burdens and make it more likely that PGCPS can produce all of the electricity necessary for its own operations. While energy efficiency is important though, it is still important for buildings to be healthy learning environments and efficiency should not be at the expense of good natural lighting and exchanging air between the indoors and outdoors, though many modern systems and materials can do both tasks with much more efficiency.

The Work Group does not intend for the recommendations to be applied to major projects currently in planning, design and construction, however, the Capital Projects department is encouraged to incorporate recommendations where possible.

Implementation Steps:

A. Evaluate the most effective approach to compliance with Maryland Green Building Standards requirements which allow for achievement of the goal of a Net-Zero Ready (NZR) school:
    a. Look at use of the accepted options of LEED (minimum of Silver certification), Green Globe (minimum of 2 globes), or IgCC, as well as the potential to rely on use of waivers to rely on ASHRAE Advanced Energy Design Guide for K-12 School Buildings or Collaborative for Higher Performing Schools (CHPS).
    b. If the most effective option is not a default option under the Maryland Green Buildings Standards advocate for its inclusion. (M2.Buildings.A)
B. All new buildings will be designed to be solar ready, and when grant funds are available or deemed cost effective, have solar installed. (M2.Buildings.B)
C. Develop an estimate for an appropriate energy efficiency standard in terms of EUIs and ensure all new buildings will meet that standard. (M3.Buildings.C)
D. All new buildings will meet daylight and healthy indoor air needs of students. (M3.Buildings.D)
E. HVAC and Water Heatings Systems will move towards fossil fuel free in all new schools.
    a. Continue to include geothermal heat pumps and air source heat pumps in “total cost of operation” evaluations and include potential costs of retrofitting schools with such systems in 2040 in scenarios that rely on fossil fuels.
    b. For buildings within close proximity to each other, consider the use of a district heat pump system.
    c. Include language in all RFPs for projects to explicitly state the IAC and DGS guidelines and to prioritize geothermal heat pumps and secondarily air source heat pumps for HVAC and water heating systems.
    d. Beginning in 2024, eliminate consideration of HVAC and water heating systems powered by fossil-fuels in new buildings. (M4.Buildings.E)
F. Seek out funding mechanisms to lower the upfront costs for NZR buildings, including, but not limited to:

a. Maryland Energy Administration (MEA) Combined Heat and Power Grant Program, which includes funds for systems that use waste heat;
b. MEA Jane Lawton Loan Program;
c. MEA Decarbonizing Public Schools Pilot Program;
d. Sale of Maryland Geothermal Renewable Energy Credits (RECs); and
e. On buildings with solar installed, sale of Maryland Solar RECs. (M3.Buildings.F)

M3 Research and Potentially Implement Wastewater Thermal Energy Technologies

Recently DC Water's new headquarters was built to rely on wastewater thermal energy in order to provide heating. This innovative approach is extremely efficient and makes use of heated water resources that are typically wasted when returned to treatment facilities. Furthermore, there exists local experience with this type of facility given that DC Water is located in a neighboring jurisdiction.

Implementation Steps:

A. Hold conversations with DC Water and otherwise research the potential for thermal energy technologies in PGCPS facilities, with preference given to buildings that may experience problems with geothermal installation. (M3.Buildings.A)
B. If deemed feasible, begin discussions with WSSC on developing an MOU to use wastewater for heating of PGCPS facilities. (M3.Buildings.B)

M4 Phase Out Fossil-fuel Powered Steam and Water Heating Systems

In order to meet a goal of fossil-fuel free schools by 2040, existing boilers and water heating systems will need to be replaced with fossil fuel free alternatives for buildings not slated for retirement during the time period. There are 86 remaining steam systems in operation. These types of replacements can be both challenging to undertake and somewhat costly, which certainly reinforces the need for new buildings to be built with fossil-fuel free systems to avoid the need for additional replacements. It is also likely that these replacements, especially for steam heating systems, will need to be completed as part of a more holistic building retrofit (a so-called deep retrofit).

Implementation Steps:

A. Perform a comprehensive life span schedule for HVAC and building operations equipment for the purpose of capital forecasting. (M4.Buildings.A)
B. Based on M4.Buildings.A develop a strategy to phase out use of all fossil to phase out use of remaining fossil-fuel power by 2040 that:
    a. Prioritizes full building retrofits that result in use of a heat pump or other appropriate non-fossil fuel powered system for heating and air conditioning purposes.
    b. Has a schedule of replacement of fossil-fuel powered boilers and water heating systems that considers:
        i. The schedule of building replacement with a weighting towards buildings that are not expected to be replaced in the next 15 years.
        ii. The need for other major upgrades, such as roofs, pipes, and other upgrades, since replacement of HVAC systems with heat pumps can be invasive for many buildings.
        iii. Weighting towards projects occurring in historically disadvantaged communities.
        iv. Weighting towards projects that can also improve indoor air quality.

v. Weighting towards projects that can provide learning opportunities for students or demonstration projects for the public at large.

c. Is developed in conjunction with M5.Buildings (M4.Buildings.B)

C. Seek out funding mechanisms to lower the upfront costs of replacement with fossil-fuel free technologies including, but not limited to:
   a. MEA Combined Heat and Power Grant Program, which includes funds for systems that use waste heat;
   b. MEA Jane Lawton Loan Program; and
   c. Sale of Maryland Geothermal RECs. (M5.Buildings.C)

M5 Phase Out R-22 HVAC

Chlorodifluoromethane or difluoromonochloromethane, better known as R-22, was a commonly used refrigerant.that is being phased out due to its high ozone depletion potential (ODP) and high global warming potential (GWP). Approximately 33 buildings still have systems that rely on cooling systems that use R-22.

Implementation Steps:

A. Develop a plan to phase out use of remaining R-22 systems by 2030 that:
   a. Prioritizes full building retrofits that result in use of a heat pump or other appropriate non-fossil fuel powered system for heating and air conditioning purposes.
   b. Replace use of R-22 with an appropriate equivalent chemical with lower ODP and GWP and conduct necessary retrofits to allow for such chemical's use, if necessary.
   c. Is developed in conjunction with M4.Buildings (M5.Buildings.A)

B. Properly recycle or dispose of existing R-22 without considering resale. (M5.Buildings.B)

Resiliency Adaptation Actions

A1 Design All New PGCPS Buildings To Be Resiliency Hubs

As climate change worsens the threat of more extreme weather such as hurricanes and flash floods will rise creating a need for buildings to be more resilient to times when electric and other utilities are rendered unfunctioning. In addition to weather events that can lead to problems accessing electricity and fossil-fuels, there have been recent instances of cyberattacks that negatively impact infrastructure. In the future, such attacks could impact the ability of PGCPS to access electricity, natural gas, and water. During these extreme events, to continue school operations, and to provide the community at large to services, PGCPS can develop buildings as resiliency hubs.

Implementation Steps:

A. To ensure electricity during extreme weather events, all new PGCPS buildings will be designed with, or ready for, resiliency hub technology including, electric bus and solar battery backups and electric vehicle charging stations. (see Transportation) (A1.Buildings.A).

B. New and retrofitted buildings will be designed with the components to be built with the ability to island the school or the school and nearby buildings as a microgrid. (A1.Buildings.B).
C. Develop a better understanding of the implications for power storage in relation to PGCPS buildings acting as Maryland Emergency Management Agency (MEMA) shelters and develop the strategy for battery usage appropriately. (A1.Buildings.C).
D. Grants offered by FEMA and other agencies at the federal and state level should be pursued to offset the costs of creating resiliency hubs including, but not limited to:
    a. FEMA Building Resilient Infrastructure and Communities (BRIC) Grants;
    b. MEA Resiliency Hub Grant Program;
    c. MEA Resilient Maryland Capital Development Pilot Program; and
    d. MEA Resilient Maryland Program (A1.Buildings.D).

Recommendation Number	Operational Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
O1 Buildings	Require Private Partners Participate In All Rebates and Other Appropriate Programs	◉	◎	◉	◉	1
O2 Buildings	Collect and Disseminate Data on Building Energy Performance	◉	◎	◉	◉	3-5
O3 Buildings	Build Staff Capacity in Building Maintenance and Management	◉	◒	◉	◉	2-5
O4 Buildings	Consolidate PGCPS Administration/Central Office Staff	◉	◎	◎	◉	5

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Recommendation Number	Mitigation Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
M1 Buildings	Perform Comprehensive Energy Audit All Existing Buildings and Rely on Data for EFMP Cycles	◉	◒	◉	◉	1-3
M2 Buildings	Move Towards Fossil-Fuel Free/Net Zero Ready for All New Construction	◉	◒	◉	◉	5+

M3 Buildings	Research and Potentially Implement Wastewater Thermal Energy Technologies	◉	◒	◉	◉	5+
M4 Buildings	Phase Out Fossil-fuel Powered Steam and Water Heating Systems	◒	◉	◉	◉	1-15
M5 Buildings	Phase Out R-22 HVAC	◉	◉	◉	◉	1-15

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Recommendation Number	Resiliency Recommendation	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
A1 Buildings	Design All New PGCPS Buildings to Be Resiliency Hubs	◉	◒	◉	◒	3-5

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Equity Considerations

The major equity consideration when it comes to buildings is that some communities have students that are learning in buildings with little to no air conditioning, poor indoor air quality due to mold and other issues, lead pipes, and other traits that make certain buildings less than healthy to learn in. As PGCPS moves forward with replacing buildings with more efficient ones, conducting deep retrofits, and otherwise improving the efficiency of schools, priority needs to be given to schools that continue to face other problems that impact the learning ability and health of students, especially in disadvantaged communities.

Labor Partner Considerations

Constructing, maintaining, and retrofitting buildings requires numerous labor partners, both within and outside of the PGCPS. Changing the heating, electrical, and other systems in buildings to be fossil-fuel free can lead to the need for a labor force that requires different skills. PGCPS should ensure that the CTE program is preparing the future workforce to be able to work with heat pump systems, building energy management, solar panels, and emerging technologies. There may be a need for outside labor partners to reskill to meet the needs for these projects. For example, pipefitters may need to be able to work with geothermal heat pump systems rather than natural gas piping. PGCPS should reach out to labor partners that typically work on projects to ensure their membership is developing the skills necessary to meet future needs.

Once systems are installed and in use though, PGCPS will need to make sure it has skilled persons to be able to maintain the systems and manage the systems. A well maintained system, whether or not it is powered with fossil-fuels, will run more efficiently and last longer, saving PGCPS in both capital and operating resources. Well managed systems will allow

problems to be found earlier, saving fuel and money. A skilled and right-size workforce must exist for these benefits to accrue to PGCPS. More detail on recommendations for the need for training and staffing is in recommendation O3.Buildings.

Current PGCPS Highlights: Glenarden Woods Elementary School LEED Gold Major Renovation

Completed in 2017, Glenarden Woods Elementary earned LEED Gold certification, with 69 points, through the U.S. Green Building Council (USGBC). This project was a major renovation rather than new construction. The 74,622 square-foot school was renovated and received a 40,110 square-foot addition.

A major challenge involved upgrading the existing building to meet the high standards of LEED Gold. The building now has a solar array, a geothermal heat pump for heating and cooling, increased natural lighting, systems that save potable water, and flexible classroom space. The school was also awarded the honor of being an Exemplary High Performing Schools National Blue Ribbon School for 2019 by the U.S. Secretary of Education and was a finalist for the Wintergreen Award. The conservation strategies are estimated to save about $10,000 in annual operating costs. See Sources of Data Referenced for additional information.

Photo Credits: PGCPS and Moseley Architects

Implementation Team

Lead Agency

The Department of Capital Programs will be the lead agency in regards to this effort. They will be the lead on developing plans for installation of fossil-free systems in new buildings, ensuring designs for new buildings are efficient, and developing a proper retrofit schedule. Though they are the lead, they will need to work closely with the Department of Building Services as an important partner.

Supporting Partners

The Department of Building Services will be responsible for installation of energy saving technologies, management of energy systems, and maintenance of the buildings.

Chief Information & Technology Officer will need to assist in ensuring computer technologies needed to manage the smart energy systems work properly.

The Department of Budget & Management Services will need to assist on development of contracts, approaches to financing replacement and retrofit projects.

Measurement and Tracking

O1 Require Private Partners to Participate In All Rebates and Other Appropriate Financial Programs

1. Percentage of RFPs that contain this provision.

O2 Collect and Disseminate Data on Building Performance

1. Percentage of buildings with energy monitoring systems.
2. Inclusion of building performance in the EFMP cycle.
3. System-wide EAU overtime.
4. Access to energy performance dashboard.

O3 Build Staff Capacity in Building Maintenance and Management

1. Number of buildings engineers and ratio of engineers to schools.
2. Number of building maintenance staff and ratio of maintenance staff to school
3. Number of training sessions taken.

O4 Consolidate PGCPS Administration/Central Office Staff

1. Number of administrative buildings in active use.

M1 Perform Comprehensive Energy Audit All Existing Buildings and Rely on Data for EFMP Cycles

1. Number and percentage of buildings audited.
2. Number of audit recommendations implemented.
3. Total energy savings.

M2 All New Construction Will Move Towards Ultra Efficient Fossil-Fuel Free/Net Zero Ready

1. Annual energy usage in new schools.
2. Annual operating costs in terms of energy use, system maintenance, etc.

M3 Research and Potentially Implement Wastewater Thermal Energy Technologies

1. Number of wastewater thermal energy systems implemented.

M4 Phase Out Fossil-fuel Powered Steam and Water Heating Systems

1. Number, size, and fuel of each fossil fuel boiler.
2. Number, size, and fuel of each fossil fuel water heater.

M5 Phase Out R-22 HVAC

1. Number, size, and fuel of each HVAC system using R-22.

A1 All New PGCPS Buildings Will Be Designed As Resiliency Hubs

1. Number and percentage of schools capable of islanding.
2. Total and size of battery backup power by school.

Helpful Resources

- "PGCPS New Construction Overview" for CCAP Focus Work Group, October 20, 2021 https://go.boarddocs.com/mabe/pgcps/Board.nsf/files/C82HMD49233B/$file/CCAP%20-%20Green%20Schools%20Overview.pdf
- "New Buildings Institute Zero Energy and Carbon Schools in Maryland" presentation to the CCAP Focus Work Group, October 20, 2021 https://go.boarddocs.com/mabe/pgcps/Board.nsf/files/C82HSJ49E063/$file/CCAP%20-%20Zero%20Energy%20and%20Carbon%20Schools%20in%20MD.pdf
- Collaborative For Higher Performing Schools. "CHPS Best Practices Manual." https://chps.net/best-practices-manual
- EPA. "Energy Star Building Performance Manager." https://www.energystar.gov/buildings/benchmark
- FEMA. "Building Resilient Infrastructure and Communities (BRIC) Grants." FEMA Building Resilient Infrastructure and Communities (BRIC) Grants
- Maryland Commission on Climate Change - Buildings Subgroup. "Decarbonizing Buildings in Maryland." September 2021. https://mde.maryland.gov/programs/Air/ClimateChange/MCCC/MWG/Decarbonizing%20Buildings%20in%20Maryland.pdf
- Maryland Department of General Services. 21st century Schools Facilities Act Guidelines (October 2019)
- Maryland Department of General Services. 2012 International Green Construction Code (IgCC): Maryland Green Building Council Supplement (November 2014)
- Maryland Department of General Services. "High Performance Green Building Program." https://dgs.maryland.gov/Documents/GreenBuilding/regulations/HighPerformanceGreenBuildingProgram.pdf
- Maryland Department of General Services. "Procedure Manual for Professional Services." https://dgs.maryland.gov/Documents/ofp/Manual.pdf
- https://www.mgaleg.maryland.gov/mgawebsite/Legislation/Details/hb1007?ys=2021RS
- Maryland Energy Administration. "Combined Heat and Power Grant Program." https://energy.maryland.gov/business/Pages/MEACHP.aspx
- Maryland Energy Administration, Decarbonizing Public Schools Program (Pilot) FY22 https://energy.maryland.gov/Pages/SchoolDecarbonization.aspx
- Maryland Energy Administration. Jane Lawton Loan Program. https://energy.maryland.gov/govt/pages/janeelawton.aspx

- Maryland Energy Administration. “Resiliency Hub Grant Program.” https://energy.maryland.gov/Pages/Resiliency-Hub.aspx
- Maryland Energy Administration. “Resilient Maryland Capital Development Pilot Program.” https://energy.maryland.gov/business/Pages/incentives/Resilient-Maryland-Capital-Development-Pilot-Program.aspx
- Maryland Energy Administration. “Resilient Maryland Program.” https://energy.maryland.gov/business/pages/ResilientMaryland.aspx
- Maryland General Assembly. Maryland Green Building Council State Finance & Procurement Article 4-809
- Maryland General Assembly. Maryland High Performance Building Act State Finance & Procurement Article 3-602.1
- Maryland General Assembly. Renewable Energy Portfolio Standard and Geothermal Heating and Cooling Systems, HB 1007 2021 Session.
- Maryland General Assembly. State Public School Construction Education Article 5-312
- Maryland Interagency Commission on School Construction (IAC). “High Performance Building Initiatives in Maryland Public Schools.” January 2010. https://iac.mdschoolconstruction.org/wp-content/uploads/2020/10/High-Performance-Initiatives-Jan-2010.pdf
- New Buildings Institute. “Getting to Zero Buildings Database.” https://newbuildings.org/resource/getting-to-zero-database/
- New Buildings Institute. “ZNE For State Buildings.” https://newbuildings.org/resource/zne-project-guide-for-state-buildings/
- PGCPS Educational Facilities Master Plan (EFMP) FY22 Amendments https://offices.pgcps.org/capital-programs/capital-programs/cards/Educational-Facilities-Master-Plan/
- PGCPS Department of Capital Programs https://offices.pgcps.org/cip/
- PGCPS Department of Building Services https://www.pgcps.org/offices/building-services
- Rocky Mountain Institute. “Managing Deep Energy Retrofits.” https://d231jw5ce53gcq.cloudfront.net/wp-content/uploads/2017/04/RetroFit_Depot_Managing_Guide_1.1.pdf
- Rocky Mountain Institute. “Identifying Design Opportunities for Deep Energy Retrofits.” https://d231jw5ce53gcq.cloudfront.net/wp-content/uploads/2017/03/Pathways-to-Zero_ID-Opps-for-Deep-Retrofits_Report_2012.pdf
- US Department of Energy. “Energy Service Companies.” https://www.energy.gov/eere/femp/energy-service-companies-0
- U.S. Green Building Council LEED Rating System https://www.usgbc.org/leed
- USGBC Massachusetts. “Zero Energy Buildings in Massachusetts: Saving Money from the Start.” https://builtenvironmentplus.org/wp-content/uploads/2019/09/ZeroEnergyBldgMA2019.pdf

Sources of Data Referenced

- U.S. Green Building Council, PGCPS Glenarden Woods Case Study https://www.usgbc.org/projects/glenarden-woods-elementary-school
- Moseley Architects, PGCPS Glenarden Woods, Case Study Press Release https://www.prnewswire.com/news-releases/glenarden-woods-elementary-school-designed-by-moseley-architects-earns-leed-gold-300934003.html
- HESS Construction, PGCPS Glenarden Woods, Case Study https://www.hessconstruction.com/projects/glenarden-woods-elementary-school/

Priority Recommendation #3: Commit to Renewable Energy Sources for a Net Zero Emissions Future

Electricity is important for the functioning of current schools and will become even more important as PGCPS moves towards a zero emissions future. Current Maryland Law requires that 33.1% of electricity must come from renewable energy, which still leaves the majority of electricity use defaulted towards greenhouse gas emitting fossil fuels. Electricity is currently used in schools for lighting, some heating, air conditioning, operations of computers and other electronics. As time progresses, more electricity will be required for heating and charging of vehicles, specifically electric buses. In order for PGCPS to meet the goals of 100% clean electricity by 2030, PGCPS will have to reduce its load when possible, produce more electricity on-site, and specifically contract for renewables for the remainder.

Priority Recommendation #3: Commit to Renewable Energy Sources for a Net Zero Emissions Future outlines 2 Operational Actions, 2 Mitigation Actions, and 1 Adaptation Action considered critical to supporting the goals of this recommendation.

Operational Actions

O1 Begin Renewable Energy Purchasing Through Wholesale Markets

PGCPS currently relies on contracts for electricity and fuel purchases developed by the Baltimore Regional Cooperative Purchasing Committee (BRCPC) which is a committee of the Baltimore Metropolitan Council (BMC). The BMC is made up of the City of Baltimore and the other jurisdictions that make up its Metropolitan Planning Organization (MPO). Prince George's County is part of a Metropolitan Washington Council of Governments (MWCOG), which is a parallel organization for the Washington, DC, metropolitan area. A similar procurement committee has not been developed by MWCOG, which may be due to the fact that MWCOG covers three state equivalent jurisdictions. BMC is entirely within the state of Maryland, which allows the level of effort for contract negotiations for electricity and fuel purchases to be more reasonable. This however presents a problem with moving PGCPS power purchasing towards 100% clean electricity on the wholesale markets. PGCPS staff will need to develop their own contracts, a new cooperative purchasing committee will have to be spun up by MWCOG, or BRCPC will have to be influenced by an outside party to move towards 100% clean electricity. Influencing BRCPC will be challenging since direction will need to come from its membership in the BMC. It is also possible that all of this could become a moot point if the Maryland General Assembly were to legislate a Renewable Portfolio Standard (RPS) of 100%.

Implementation Steps:

A. Begin discussions with Montgomery County Public Schools, Prince George's County Government, Montgomery County Government, the MWCOG, and Maryland municipalities in the Washington metropolitan area to develop procurement contracts separate from BRCPC. (O1.Electricity.A)
B. Limit the amount of electricity needed to be purchased through increased solar installations on PGCPS properties, reducing load needed to maintain the level of service through efficiency measures. (O1.Electricity.B)
A. Use Power Purchasing Agreement (PPAs) to contract for renewables to procure what cannot be produced on PGCPS properties. (O1.Electricity.C)
B. Advocate for state legislation to require 100% clean electricity by 2030, though PGCPS should work under the assumption that they will have to rely on recommendations A through C. (O1.Electricity.D)

O2 Create a Publicly Available Dashboard

Allowing students and the public at large to learn from the progress being made with onsite solar installation at PGCPS buildings will allow for more buy-in in the transition. Data from solar installation can also be used as a tool for students to learn from in science and CTE tracks, among others.

A. Create a web-based dashboard to allow students to learn about the solar power being generated at their buildings and help the broader public understand the progress being made by PGCPS. Consider having a running version of each school's dashboard visibility available near to the entrance of a school or some other high traffic area. (O2.Electricity.A)

Mitigation Actions

M1 Install Solar Panels on PGCPS Property

Schools offer several strong benefits to onsite solar installation. Schools often have large roofs and just a few floors making them amenable to rooftop solar installation. Schools also typically have larger parking lots allowing for the opportunity for solar canopy installation. Many schools' energy needs are reduced during the summer allowing for the possibility of excess high value peak generation to be sold back to the grid to offset costs. This can become even more valuable if augmented by Vehicle-to-Grid (V2G) buses as discussed in Priority Recommendation Section 3. Schools also provide an opportunity for the student body and community at large to see the benefits of solar installations in their neighborhood. Solar installations on schools are also a visible signal to the students and the greater community that PGCPS is undertaking climate action and, in terms of the electricity sector, the most popular choice students and the public at large.

Bowie State University solar canopy parking lot.

While there are many benefits to onsite solar installation, it is not without its challenges. The roofs on PGCPS schools are 18.9 years on average and 142 are rated poor or worse by PGCPS. Installation on existing schools is somewhat limited due the age and condition of the roofs without roof upgrades. There are also strict stormwater management requirements in Prince George's County that require some roof space in new construction to be used as green roofs. There is also a need to plant trees for the benefits of carbon sequestration, energy load reduction, stormwater benefits, and other environmental services, but the trees can also reduce the power generated from a rooftop solar system.

Implementation Steps:

A. Concerning new buildings, include language in Request for Proposals (RFPs) for new schools that buildings be solar ready and ensure that 10% of new buildings have solar arrays installed. (M2.Electricity.A)

B. Concerning existing buildings, begin by developing a plan to install onsite solar on 20 properties using a holistic evaluation of the solar potential for existing buildings. This evaluation should consider, but not be limited to:
    a. The schedule of building replacement with a weighting towards buildings that are not expected to be replaced in the next 15 years.
    b. The schedule of roof replacements, with a weighting of coupling solar projects with roof replacements, particularly to help amortize the costs.
    c. Weighting towards projects occurring in historically disadvantaged communities.
    d. Weighting towards projects that can provide learning opportunities for students or demonstration projects for the public at large.
    e. Canopy projects and ground projects as secondary and tertiary options, respectively.
    f. Pooling of projects to provide electricity for multiple schools.
    g. Relevant federal, state, and county policies, in particular, the Maryland Renewable Portfolio Standard (RPS) the Net Zero Energy (NZE) school study required under HB 630 (MDGA 2021). (M2.Electricity.B)
C. Evaluate funding opportunities for onsite projects, both for new construction and retrofit of existing buildings, including, but not limited to:
    a. Federal funding, including ones offered by the U.S. Department of Energy (DOE) Solar Energy Technologies Office (SETO) (note that SETO often seeks more innovative, rather than run of the mill projects).
    b. State funding, including the Jane Lawton Loan Program, Solar PV Canopy Grant.
    c. Non-governmental grants. It should be noted that while there have been numerous foundations that offered grants (American Solar Energy Society, National Energy Education Development Project (NEED), The Walmart Foundation) there do not appear to be many opportunities from NGOs in this sector.
    d. Power purchase agreements (PPAs) or leases for onsite solar.
    e. Sale of Solar Renewable Energy Credits. (SRECs) (M2.Electricity.C)

"I consider it a privilege to be a part of the sub-work group on electricity and solar power and being able to contribute in any small way that I could. I admire the enthusiasm with which the members embraced the challenge, and seeing firsthand the passion of the students in recognizing the seriousness of the threat of climate change and their commitments to playing a part in addressing it. I look forward to continuing efforts in taking the vision forward as it unfolds."--*Michael Harris, Senior Capital Projects Manager, Bowie State University and Work Group Member*

M2 Sign Onto Power Purchase Agreements (PPAs) for Offsite Renewable Energy

In action M1.Electricity, the benefits of installation of solar panels on PGCPS owned properties was outline, however, not all properties may be suitable for solar panels or may not be able to generate enough power. In action O1.Electricity, purchasing clean electricity through the open market was discussed though PGCPS has less control over that process, particularly if it relies on BRCPC contracts. The third option available is the use of PPAs for projects constructed elsewhere. This type of project involves a much clearer linkage between PGCPS and the renewable energy generated than with the contracts in O1.Electricity and it also can make up

the difference for solar power for properties that are not conducive to solar installation for any number or reasons. Finally, it is possible to allow wind projects to be incorporated into the mix since wind generation is not currently feasible on PGCPS properties. In reality a combination of O1.Electricity, M1.Electricity, M2.Electricity will likely be necessary for PGCPS to achieve 100% clean electricity.

Implementation Steps:

A. Evaluate the availability to purchase off site renewables not owned or managed by PGCPS through such mechanisms as PPAs for offsite solar, preferably within the county or at a minimum the state, and wind production. (M2.Electricity.A)

Resiliency Adaptation Actions

A1 Explore Approaches to Integrate Battery Backup Power

In conventional use, backup power is required in the case of an emergency, either a short-term loss of power or something more long-term such as a major snow event, a hurricane or other natural disaster. As movement occurs towards more use of renewable energy, specifically wind and solar, storage of this power will become a greater need to power systems during times when generation drops, such as cloudy days or during the night. As a result, in the long-term schools will need to have a greater capacity to store electricity onsite or have access to offsite electricity storage resources. However, with the current technologies, battery storage does not appear to be ready for all uses that schools may need, though some niche areas are currently ready to see battery backup power.

Implementation Steps:

A. Develop a checklist of services that require back up energy, the type and amount of fuel needed to power them, and the worst case operating conditions. (A1.Electricity.A)
B. Onsite batteries should be kept in consideration for the purposes of functions that require power for medium to long durations, medium to high load, or are irregular, in case technology advances much quicker than expected, but not be examined specifically at this point. This being said, new schools should be built to be “battery ready,” so as to reduce retrofit cost as battery technology improves in the next ten years. (A1.Electricity.B)
C. For specific short-term back-up power use, when reasonable, batteries should be given higher priority augment functions that only need a short duration, low load, and regularly rely on backup power such as emergency lighting. (A1.Electricity.C)
D. The recommendations for use of electric buses as battery backup using Vehicle-to-Building (V2B) or Vehicle-to-Grid (V2G) found in M1 Transportation.D should be followed. (A1.Electricity.D)

Recommendation Number	Operational Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
O1 Electricity	Begin Renewable Energy Purchasing Through Wholesale Markets	◎	◒	◒	◉	3+
O2 Electricity	Create a Publicly Available Dashboard	◎	◒	◒	◉	3+

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Recommendation Number	Mitigation Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
M1 Electricity	Install Solar Panels on PGCPS Property	◉	◉	◉	◉	1-15
M2 Electricity	Sign Onto Power Purchase Agreements (PPA) for Offsite Renewable Energy	◉	◒	◒	◉	1-3

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Recommendation Number	Resiliency Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
A1 Electricity	Explore Approaches to Integrate Battery Backup Power	◎	◒	◒	◎	5+

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Current PGCPS Highlights: School Based Installed Solar Projects

There are four PGCPS schools that currently have roof-top solar installed: Oxon Hill High School, Greenbelt Middle School, Glenarden Woods Elementary and University Park Elementary.

In July 2013, University Park Elementary School became the first PGCPS school to host a rooftop solar array. The solar project is a partnership between the Town of University Park and PGCPS. The solar array generates clean energy and also provides the Town and PGCPS with a shared revenue stream annually from the sale of electricity and renewable energy tax credits.

The project was funded by a U.S. Department of Energy grant to the Town for the Small Town Energy Program (STEP). This means the solar panel array is fully paid for, from design and construction to maintenance and eventual removal at the end of its 25-year life, and that it will deliver clean energy and revenues at no cost to the Town or to PGCPS.

“The installation is a terrific example of a successful public-private partnership that delivers multiple benefits to the community, and we are pleased to be part of it!” said Former Mayor John Tabori.

The Oxon Hill High School solar array is the first community solar energy generating system to receive authorization to operate within Pepco’s Maryland territory, and one of the first large rooftop community solar projects in Maryland. In addition, it is the first community solar project in this utility territory that will supply energy to Pepco’s low- and moderate-income (LMI) residents.

Photo credits: PGCPS and Neighborhood Sun

Equity Considerations

When it comes to electricity purchasing decisions recommended in the plan, all PGCPS schools, and Prince George's County stakeholders, will be affected equally so a switch to a renewable energy provider for power contracts does not have any direct equity considerations.

The same goes for any off site PPA project that would be applied to all schools within the system. One area to consider for PPA's may be to focus on solar projects that result in remediation of a particularly troublesome property in Prince George's County, such as was done when Neighborhood Sun installed its community solar array on the site Panorama Landfill.

In terms of onsite solar installations, the recommendations specifically call for historically disadvantaged populations to get priority in siting of the new school solar related facilities.

Given that we are not recommending wide-spread adoption of battery backup power at this stage, there are no issues of note in terms of distribution. Since conventional fossil-fuel powered backup power will continue to be relied upon, any installations or replacements of generators should be done with Tier 4 engines to limit the air pollution students and others are exposed to from backup generator use.

Labor Partner Considerations

It is unlikely that switching electricity providers or relying on PPAs would have any impact on PGCPS labor partners. Concerning onsite solar installation, any route that involves ownership of panels by a third party would also likely have little impact, If solar projects are owned by PGCPS directly, staff will need to be trained in maintenance of panels or contractors will be necessary. The same situation would occur for use of batteries for backup power purposes. If they are installed through a PPA or leasing agreement, it would be the third party's responsibility, but, if batteries are installed and maintained by PGCPS, then training of staff or contracting would be necessary. As batteries become more prevalent there would also be a need to retrain staff devoted to maintenance of current backup generators.

Implementation Team

Lead Agency

The Department of Building Services will be the lead agency in regards to this effort. The will be the lead on determining new approaches to procuring electricity and approaches to reducing load.

Supporting Partners

The Department of Capital Programs will be responsible for installation of solar projects on new and existing buildings.

Chief Information & Technology Officer will need to assist in ensuring computer technologies needed to manage electrical production systems and ensure that smart energy systems properly work.

The Department of Budget & Management Services will need to assist on development of contracts and approaches to financing solar projects.

Measurement and Tracking

O1 Begin Renewable Energy Purchasing Through Wholesale Markets

1. Percentage of electricity consumption from (a) PGCPS solar installations, (b) PPAs, (c) 100% clean electricity contracts, and (d) general power mix contracts.

O2 Create a Publically Available Dashboard

1. Existence of the dashboard.

M1 Install Solar Panels on PGCPS Property

1. Total MWs of onsite installed on PGCPS properties, location of installations, and date of installations.
2. Total monthly generation from PGCPS owned solar installations.

M2 Sign Onto Power Purchase Agreements (PPA) for Offsite Renewable Energy

1. Total MWs of PPAs, location of projects, and length of contracts.

A1 Explore Approaches to Integrate Battery Backup Power

1. Total MWs of battery backup power.

Helpful Resources

- "Green Power for PGCPS" presentation by Michael Harris, Bowie State University, to CCAP Focus Work Group, November 3, 2021 https://go.boarddocs.com/mabe/pgcps/Board.nsf/files/C8ET7G75E29D/$file/SOLAR%20POWER%20FOR%20PGCP%20-%20FINAL.pdf
- Department of Energy Solar Energy Technologies Office (SETO) Funding Opportunities. https://www.energy.gov/eere/solar/funding-opportunities
- Environment America. Microgrids and Energy Storage. https://environmentamerica.org/energy-101/microgrids-energy-storage
- Generation 180. "Brighter Future Report 2020: Third Edition." 2020. https://generation180.org/brighter-future-2020-download/?submissionGuid=aeea85d1-e1a1-46bf-90a0-ea113ccfb1b9
- Maryland Energy Administration. Jane Lawton Loan Program. https://energy.maryland.gov/govt/pages/janeelawton.aspx
- Maryland Energy Administration. Maryland Energy Storage Income Tax Credit. https://energy.maryland.gov/business/Pages/EnergyStorage.aspx
- Maryland Energy Administration. Public Facility Solar Grant Program. https://energy.maryland.gov/govt/Pages/PublicFacilitySolarGrantProgram.aspx
- Maryland Energy Administration. Solar PV Canopy Grant. https://energy.maryland.gov/business/Pages/incentives/PVEVprogram.aspx
- Maryland Renewable Energy Portfolio Standard - Public Utilities Article §7
- Renewable Energy Portfolio Standard Program COMAR 20.61
- Community Solar Energy Generation Systems COMAR 20.62New York State Energy Research and Development Authority. New York Battery Energy Storage System Guidebook for Local Governments. https://www.nyserda.ny.gov/-/media/Files/Programs/clean-energy-siting/battery-storage-guidebook.pdf
- PEPCO. Integrating Energy Storage. https://www.pepco.com/SiteCollectionDocuments/EnergyStorage_PepcoDC_presentation.pdf

- Solar Power Purchase Agreements: A Toolkit for Local Governments. https://irecusa.org/resources/solar-power-purchase-agreements-a-toolkit-for-local-governments-2/
- US Environmental Protection Agency. Solar Project Development Pathway & Resources. https://www.epa.gov/repowertoolbox/solar-project-development-pathway-resources
- US Office of Energy Efficiency and Renewable Energy. Solar Energy Technologies Office Solar-Plus-Storage 101. https://www.energy.gov/eere/solar/articles/solar-plus-storage-101
- News Release: New Solar Array on University Park Elementary School Roof Will Generate Clean Energy, Revenue for Town and County Public Schools https://offices.pgcps.org/communications/cards/news/2013---2014/July/New-Solar-Array-on-University-Park-ES-Roof-Will-Generate-Clean-Energy,-Revenue/
- Neighborhood Sun, Oxon Hill https://neighborhoodsun.solar/solarfarms/oxon-hill/

Kpessou Kougblenou Esther, Adelphi Elementary School
2022 PGCPS EcoAction Art Contest winner (6th-8th Grade, North category)

Priority Recommendation #4: Commit to Low Carbon School Transportation

Transportation is a key element of the school systems. Students must travel safely to and from school in order to benefit from in person learning, which is typically done using school buses. Staff and caregivers also must access schools, which is typically done by personal automobiles. School buses and personal vehicles are typically powered by fossil fuels, which contribute to greenhouse gas emissions (GHGs), as well as air pollution. Reducing these emissions is an important part of the climate action plan and will involve increasing use of zero emission vehicles, shifting from vehicles to biking and walking, and reducing the amount of miles that vehicles must travel.

Priority Recommendation #4: Commit to Low Carbon School Transportation outlines 1 Operational Action and 5 Mitigation Actions considered critical to supporting the goals of this recommendation. No direct Adaptation Actions are outlined under this recommendation.

Operational Actions

> **"The future is here! The PGCPS Transportation Department will play a major role in the future of clean energy transportation, for the health and safety of the students and a healthy environment."--***David Hill, Transportation Operations Supervisor, PGCPS Transportation Department and Work Group Member*

O1 Modify Bus Route to Fuel Use

Modifying routes in which buses travel are important for reducing the level of GHGs emitted through PGCPS's operations. Increasing the number of students per stop, canceling stops based on opt outs, and adjusting route lengths can reduce current levels of diesel consumption and the short distances will allow more routes to be electrified quicker since more routes could be covered with current battery technologies. Newer software tools can make optimization of routes possible.

Implementation Steps:

A. Review the existing routes to decrease the total number of stops through merging of stops and canceling stops that are not used, and decreasing route length with an eye towards increasing the percentage of routes that can be completed using current electric technologies. (O1 Transportation.A)

Mitigation Actions

M1 Electrify all Buses by 2040

Buses are the primary mechanism by which students travel to and from PGCPS schools. While most routes serve students who attend PGCPS schools in the County, a certain percentage of students attend specialty programs that require long routes and/or travel to other jurisdictions in Maryland and Washington, DC. The current bus fleet is all diesel vehicles. These vehicles have higher maintenance costs and fuel costs that can fluctuate widely. Diesel buses also release fine particulate matter, which enters the passenger cabin whenever a door is open. Buses pollute the air at the entrances to school buildings. Diesel particulate is linked with premature mortality, decreased lung function, and affects the ability to learn.

Diesel bus transportation is a primary emitter of GHGs in the state of Maryland. Federal and State funds are becoming more available to assist with the transition to electric school buses. Additionally, the Governor of Maryland has already signed onto a Memorandum of Understanding with the Multi-State Zero Emissions Vehicle Action Plan (2021) that would require all school buses to be electric by 2045. However, the technology for new electric buses is improving rapidly and we have already seen Montgomery County Public Schools commit to 100% of new buses being electric by 2025.

Implementation Steps:

A. Develop a strategy to begin replacement of buses with zero emission buses. This should include a clear timeline as to how to achieve 50% of routes by 2030 and 100% of routes by 2040. The roll out of buses should focus on examination of several metrics, primarily communities with higher levels of air pollution, historically disadvantaged communities, routes that are the shortest, and the unique traits of the areas. (M1.Transportation.A)
B. Develop an assessment of the infrastructure needs at bus lots, including the electricity needs, additional pavement, security, levels of air pollution in nearby communities, and the need to meet the timeframes in the bus route goals. Additionally assess whether additional layover locations are needed. (M1.Transportation.B)
C. Expand training for mechanics and drivers by:
    a. Developing an estimate of the training needs for mechanics and drivers, including licensure requirements and the fees for this training. Begin requesting funding to meet these needs in FY 2024 operating budgets.
    b. Work with ACE/AFSCME, LOCAL 2250 on the development and implementation of training to develop the necessary skills to drive and repair electric buses in house. (M1.Transportation.C)
D. Evaluate funding opportunities including, but not limited to:
    a. Federal funding, specifically Diesel Emissions Reduction Act (DERA), the Clean School Bus Program initiated under the Bipartisan Infrastructure Law (BIL), and Build Back Better (BBB) - if BBB passes;
    b. State funding, specifically potential funding from an electric bus pilot program or the Climate Solution Now Act, if they pass, and advocate for these as necessary;
    c. Other Grant opportunities, such as funds available from the World Resource Institute (WRI)/Bezos Foundation;
    d. Leasing options; and
    e. Resale of electricity through V2G technology. (M1.Transportation.D)
E. Evaluate the impacts of the rate structure on the charging of electric buses and advocate for improved rate structures with the Maryland General Assembly (MDGA) or the Maryland Public Service Commission (PSC) as necessary. (M1.Transportation.E)

M2 Increase Walking/Biking/Public Transit Use

Reliable, on-time and safe bus transportation performance is the most influential factor in reducing personal vehicle use to and from schools. For students who live in walking, biking and public transit use distance, a variety of factors have led to a culture shift in the County of personal diesel vehicles replacing these no, or low-emissions forms of travel to and from school.

Improving safe passages to schools was identified in the stakeholder survey as a priority as personal vehicles have become a health and safety threat to students and staff. Access to PGCPS schools must be safe by foot, by wheelchair, by bike, and through public transit.

Not providing these options will continue to lead to an increase in GHGs from parents/caregivers driving children to school, which will also concentrate air pollution at school entrances in the morning and afternoon. This activity also leads to increased conflict within communities, which includes blocked roads and driveways as a primary complaint.

Of course, PGCPS does not have complete control over the hiring of Prince George's County Police Department crossing guards, sidewalks, roads and public transit system. Collaboration will be needed to meet the goal of safe passages to schools. In particular, PGCPS will have to work with the municipalities, Prince George's County Department of Public Works and Transportation (DPW&T) and the Maryland State Highway Administration (SHA). Some aspects of these recommendations will require working with the Washington Metropolitan Area Transit Administration (WMATA) as well.

Implementation Steps:

A. Expand the Walk & Bike to School Campaign to at least one school per Board of Education District and 20 schools by 2025. (M2.Transportation.A)
B. Work with municipalities, Prince George's County DPW&T and the Maryland State Highway Association (SHA) to increase access to sidewalks and bike lanes within a quarter mile of elementary schools and half mile of other schools, with priority given towards communities with low car ownership, historically disadvantaged communities, and communities with higher levels of traffic incidents. (M2.Transportation.B)
C. Increase funding for crossing guards with priority being given towards communities with low car ownership, historically disadvantaged communities, and communities with higher levels of traffic incidents. (M2.Transportation.C)
D. Partner with DPW&T Bicycle and Pedestrian Program to develop a pilot program at two schools within one mile of existing Prince George's County Capital Bikeshare Stations. (M2.Transportation.D)
E. Examine approaches to provide transportation options for after school activities including micro transit and working with DPW&T on TheBus routes by schools. (M2.Transportation.E)

M3 Eliminate Unnecessary Idling from School Buses

While the expectation is that by 2040 the entirety of the PGCPS fleet will be zero emissions, PGCPS will be reliant on diesel buses through the transition. One of the major sources of emissions from the existing diesel vehicles is idling operations. Idling a diesel bus burns the same amount of fuel and produces the same levels of emissions as driving for 30 miles.(See calculator in Sources of Data Referenced) Since these operations often happen in the front of a school this concentrates air pollution where students enter and exit the building. Additionally, idling is a fuel cost to the school system so alternatives to reduce idling can save the system money. Each hour of idling costs PGCPS about $4, depending on the price of diesel. This can make technologies such as Automatic Start-Stop or Fuel Operated Heaters (FOH) aka Direct Fired Heaters (DFH) quite economical (note that both would likely be necessary so that cabin heating can continue during colder months).

There are also regulations already in place that limit the allowed amount of time vehicles such as school buses can idle in the State of Maryland to five minutes under most conditions. Analysis as to why idling is occurring despite this should be completed, but current best practices are that engines should be shut off if idling is expected for more than 3 minutes so

there is a good amount of financial savings to PGCPS as well as reduced emissions that can occur from reducing idling, either through behavioral change or technologies.

Implementation Steps:

A. Conduct a survey on the extent of school bus idling and the existing barriers to following existing idle regulations. (M3.Transportation.A)
B. Develop a cost assessment of installing Automatic Start-Stop and FOH/DFH on the existing bus fleet, and use this as a plan for widespread rollout if cost agnostic or financially beneficial. Any rollout should be completed in collaboration with labor partners to ensure that safe and comfortable working conditions are maintained. (M3.Transportation.B)
C. Develop a program to encourage students to participate in reducing idling from both the personal vehicles of parents and school buses in line with EPA best practices (M3.Transportation.C)

M4 Increase the Safety and Other Amenities Available on School Buses

In the October 2021 issue of School Transportation News Dr. Linda Bluth writes, “It is necessary … not to underestimate what is said by children to their parents, friends, teachers… about their individual school experiences.” While some students will be able to take the bus no matter what, there also exists a sizable population of students with parents/caregivers that have flexible schedules and high school students with drivers licenses that can option out of the bus. This leads to more emissions from school activity as a whole and increased air pollution at drop off points in particular.

Reliable, on-time and safe bus transportation performance is the single most important tool to increase ridership. The survey conducted by the CCAP Focus Work Group provided some insights into the thoughts of students in particular into the state of the buses. Some of these suggestions appear to come in at a reasonable cost and can be easily implemented and other suggestions are already being implemented by PGCPS.

Additionally, information is crucial to both parents and students in order to encourage increased bus riding. Students and parents/caregivers need to be aware of the safety features and amenities as they become available through active communication. Parents/caregivers need to be able to have accurate information as to when pick-ups and drop-offs will occur.

In order to keep bus ridership high so as to avoid parents taking single vehicle trips to schools, PGCPS must make sure the school population at large has access to safe buses with a positive experience and the knowledge that this is the best option.

Implementation Steps:

A. Ensure that all new buses have installed:
    a. Seat belts;
    b. Air conditioning;
    c. Outside of the bus safety cameras; and
    d. Wi-fi. (M4.Transportation.A)
B. Ensure that the GPS tracking system and alerts are accurate and functioning. (M4.Transportation.B)

C. Collaborate with communications staff to inform students in particular, and the public at large, of the improvements to the bus fleet on-time reliability and safety. (M4.Transportation.C)
D. Allocate increased funding and other resources to ensure full bus driver staffing. (M4.Transportation.D)

M5 Electrify All Light-Duty Vehicles and Other Equipment by 2040

While school buses are the primary source of emissions from PGCPS activities, the system operates a fleet of maintenance vehicles and other nonroad sources of greenhouse gas and air pollution emissions, including lawn mowers. There are three primary areas that need to be addressed.

The first is the "white fleet" or light-duty vehicles maintained by PGCPS for use by staff for work related purposes. This fleet is largely made up of light-duty vehicles and have potential to be electrified quickly. Light-duty vehicles have been on the market for far longer and needed improvements of range and cost have been mostly addressed. Additionally, light-duty vehicles are at the point where operations and maintenance costs can achieve long-term cost savings from electrification. Upfront costs can be lowered even further through cooperative purchases conducted through organizations such as Metropolitan Washington Council of Governments (MWCOG).

Equipment used in grounds' maintenance should be electrified as well. 2-stroke engines in particular produce high levels of air pollution, greenhouse gas emissions, and noise. Some jurisdictions have even moved to ban some types of equipment such as leaf blowers. At this point, only some types of equipment can be replaced without a loss in efficiency. Full-scale replacement is not yet feasible, though the types of equipment that can be replaced with electric options should be and options will grow with each passing year.

Finally, beyond the PGCPS future electric fleet, more staff and visitor vehicles will start arriving at PGCPS properties and require charging. PGCPS needs to get out in front, especially in new construction planning, to ensure that when the time comes, staff and visitors can charge their vehicles safely at PGCPS locations. What is recommended is that systems be designed with the realization that by 2040 most parking spaces will likely need the option to plug in.

However, it will be cost prohibitive, and possibly result in stranded assets, if too many chargers are installed too soon. This leads to the idea that buildings should be set up so that the infrastructure, such as conduits are in place, but the chargers are only added to the system as needed, otherwise known as electric vehicle ready (EV ready). In the next five years, some chargers are needed so it is recommended that charger installations begin in small numbers throughout the system now. PGCPS is a prime potential partner to EV charging station network goals of the Federal, State and County governments and should pursue all opportunities for installation partnerships.

Implementation Steps:

A. Develop a plan to electrify 95% of the light-duty fleet "white fleet" by 2032 and implement the plan. (M5.Transportation.A)
B. Develop a plan to electrify 25% of the nonroad equipment fleet by 2032 and implement the plan. This plan should be developed in collaboration with groundskeeping staff. (M5.Transportation.B)

C. Ensure all new buildings are, at a minimum, ready for light-duty EV charging, and preferably include 2 Level 2 EV chargers and 5 Level 1 EV chargers. (M5.Transportation.C)

Recommendation Number	Operational Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
O1 Transportation	Modify Bus Route to Fuel Use	◉	◉	◒	◉	3-5

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Recommendation Number	Mitigation Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
M1 Transportation	Electrify all Buses by 2040	◉	◉	◉	◉	1-15
M2 Transportation	Increase Walking/Biking/Public Transit Use	◒	◒	◉	◉	3-5
M3 Transportation	Eliminate Unnecessary Idling from School Buses	◉	◉	◉	◉	1-3
M4 Transportation	Increase the Safety and Other Amenities Available on School Buses	◉	◒	◒	◉	1-15
M5 Transportation	Electrify All Light-Duty Vehicles and Other Equipment by 2040	◉	◒	◒	◉	1-15

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Equity Considerations

There are numerous concerns with regards to equity and justice in regards to transportation. First and foremost is that historically disadvantaged communities are often exposed to higher levels of air pollution, unsafe access to pedestrian and bicycling facilities, and have lower rates of car ownership. This needs to be kept in mind as transportation recommendations are rolled out. Prioritization of electric bus routes, sidewalk improvements, bicycle lanes, and other services in historically disadvantaged communities should be given priority.

Current PGCPS Highlights: Electric School Bus Pilot Funded Through Volkswagen Mitigation Funds

On October 3, 2019, PGCPS announced that the school system would receive $340,336 from the Maryland Department of the Environment (MDE) to launch its first electric school bus. Prince George's is one of four counties statewide to receive funds to pilot electric or alternative fuel school buses.

"Eco-friendly initiatives, such as electric school buses, help to keep our children safe inside and outside of school," said Chief Executive Officer Dr. Monica Goldson. "We are grateful for these funds and look forward to seeing our yellow school buses 'go green.'"

MDE's "clean" school bus program is funded through settlements with manufacturers who installed devices in diesel-powered vehicles to illegally bypass emission standards. The program works hand-in-hand with MDE's school bus idle reduction program, adopted by more than 50 Maryland schools. Both programs will improve air quality and provide immediate youth health benefits through reduced vehicle emissions. The buses will also reduce greenhouse gas emissions that contribute to climate change.

Prior to the announcement, PGCPS parents and Chispa Maryland engaged PGCPS school communities in the campaign to allocate the settlement funds to electric school buses.

Photo Credit: Blue Bird Corporation and Chispa Maryland

Current PGCPS Highlights: Walk, Bike & Roll to School Day at Mount Rainier Elementary School

National Walk, Bike & Roll to School Day is a bi-annual national event designed by the Safe Routes to Schools Partnership to help draw attention to the need for better pedestrian and bike rider safety, cleaner environment, reducing traffic congestion and gas emissions, and helping kids develop healthier habits.

Mount Rainier Elementary School (MRES) first participated in the national event Walk, Bike & Roll to School Day in May 2019. Prior to the event, the school conducted a poll with students to determine how many students walked to school. The research indicated that only an estimated 62 or 350 students walked to school on a regular basis. On Walk, Bike & Roll to School Day 2019, MRES nearly tripled that number!

The school and PTO then began a "Walk to School Wednesdays" campaign in which students were encouraged to walk, bike or roll the first Wednesday of each month to school. This resulted in a consistent increase in students and parents/caregivers walking and biking to school on those days. To further encourage sustainable transport to school, a footprints mural and bike racks were installed. Due to the pandemic, "Walk to School Wednesdays" paused, but Mount Rainier Elementary School remained committed to this effort.

In Spring 2021, Mount Rainier Elementary hosted three "Walk to School Wednesdays" days due to the hybrid nature of school at the time so that all kids could have the chance to participate. On the national event day held the first Wednesday in May, Mount Rainier Elementary School's Walk, Bike & Roll to School Day was hosted by Principal Jennifer Till, and attended by PGCPS CEO Dr. Monica Goldson and PGCPS Board of Education Member Pamela Boozer-Strother, and was featured on NBC4 Washington. Later that year, Riverdale Elementary participated in the National Walk and Bike to School Day on October 6th.

There have been two "Walk to School Wednesdays" in 2022 at MRES – each averaging just over 50% of the students walking, biking or rolling.

Photo Credits: Valerie Woodall and PGCPS

Labor Partner Considerations

A wide variety of changes to PGCPS labor will occur during the electric bus and vehicle transition. Drivers will need additional training in order to properly operate electric vehicles. The level of overall staffing requirements for bus drivers will likely not be affected by transition to electric vehicles. Drivers will benefit by not being exposed to air pollution in electric buses and not nearly as much if anti-idling technology is used. Bus drivers will need to be collaborated with to ensure that the rollout of anti-idling technology or the enforcement of anti-idling rules is done appropriately and does not negatively affect the drivers' working comfort.

Bus maintenance staff will also be affected by the transition. Training will be needed in order to properly repair electric buses and other electric vehicles and equipment. Given that these vehicles require less maintenance it could allow current staffing levels to become adequate to appropriately maintain the vehicle fleet. Collaboration will be necessary to ensure the transition to maintenance of electric vehicles is fair.

Implementation Team

Lead Agency

The Department of Transportation will be the lead agency in regards to this effort. They will be the lead on analyses needed to plan electrification of buses and light duty vehicles, making determinations on approaches to bus electrification including on the procurement, contracting or leasing of vehicles. They will also lead on rolling out amenities on buses and anti-idling technologies.

Supporting Partners

The Department of Capital Programs will need to ensure that charging infrastructure is included in new and existing facilities, and that safe routes to school are included in new school construction.

The Department of Building Services will be needed to work on changes to electricity procurement necessary for electrification, and electrification of nonroad equipment.

Chief Information & Technology Officer will need to assist in ensuring computer technologies needed to conduct electric charging function and that app technology is sufficient.

The Department of Budget & Management Services will need to assist on development of contracts and approaches to financing buses.

Measurement and Tracking

O1 Bus Route Modifications

1. Fuel use, VMT and starting, layover, and stopping locations of each bus route.

M1 Electrify all Buses by 2040

1. Number and percentage of electric buses in use.
2. Number and percentage of routes conducted using electric buses.

M2 Increasing Walking/Biking/Public Transit Use

1. Number of walk/bike to school day events.

M3 Eliminate Unnecessary Idling from School Buses

1. Number and percentage of buses with anti-idling equipment installed and types of equipment.
2. Results of regular, but random inspections of idling at schools county-wide.

M4 Increase the Safety and Other Amenities Available on School Buses

1. Number and percentage of buses with seat belts, air conditions, and wi-fi installed.
2. Percentage of on time routes.
3. Regular, but random checking of bus route tracking app.

M5 Electrify All Light-Duty Vehicles and Other Equipment by 2040

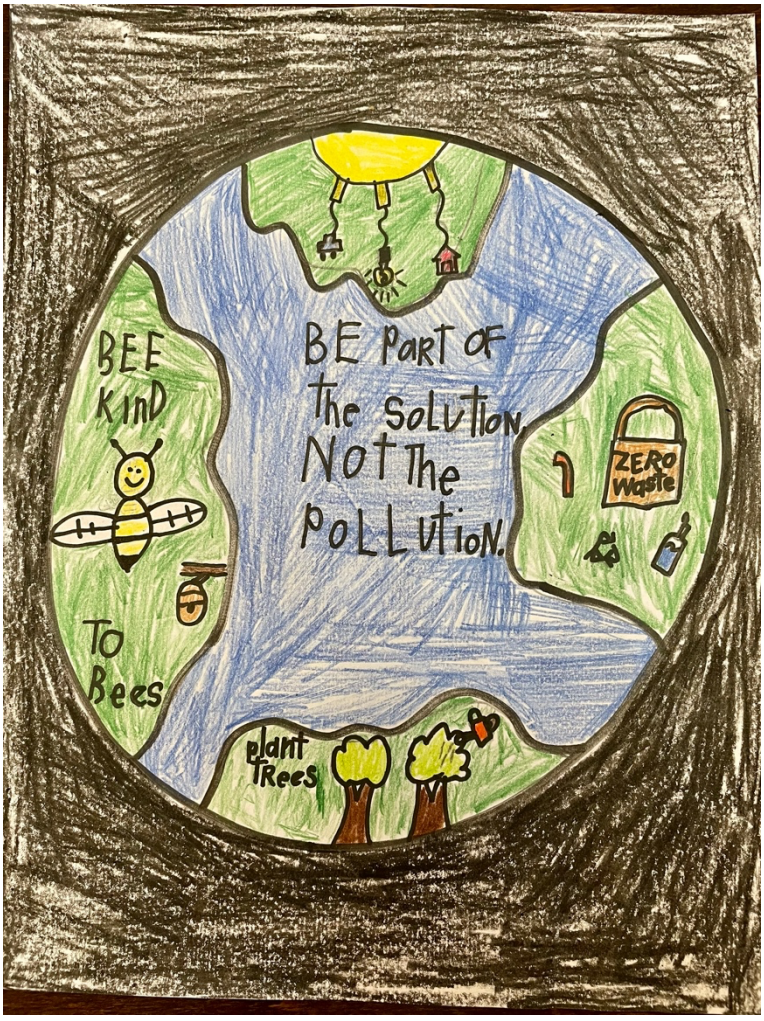
1. Number and percentage of light duty vehicles electrified.
2. Number and percentage of nonfood equipment electrified by type.
3. Number and type of electric vehicle chargers by facility.

Helpful Resources

- Maryland Zero Emission Electric Vehicle Infrastructure Council https://www.mdot.maryland.gov/OPCP/ZEEVIC-2021Report_Final.pdf
- City Fix, The. "3 Design Considerations for Electric School Bus Vehicle-to-Grid Programs." https://thecityfix.com/blog/3-design-considerations-for-electric-school-bus-vehicle-to-grid-programs/
- Maryland Department of the Environment. "Facts About Idling Reduction Technology." https://mde.maryland.gov/programs/Air/MobileSources/Documents/Idling%20Technology%20Fact%20Sheet%20Final.pdfational Academy of Sciences. "Battery Electric Buses—State of the Practice." 2018.
- Metropolitan Washington Council of Governments. "Cooperative Purchasing". https://www.mwcog.org/purchasing-and-bids/cooperative-purchasing/
- National Academy of Sciences. "Guidebook for Deploying Zero Emissions Transit Buses." 2021.
- National Renewable Energy Laboratory. Integrating Electric Vehicle Charging Infrastructure into Commercial Buildings and Mixed-Use Communities: Design, Modeling, and Control Optimization Opportunities. https://www.nrel.gov/docs/fy20osti/77438.pdf
- Prince Geroge's County. Prince George's County Strategic Roadway Safety Plan 2017-2020 https://www.princegeorgescountymd.gov/DocumentCenter/View/20149/PGC-SHSP-2017-2020_10-6-17?bidId=School Transportation News. "A Guide to Locating Funding For Electric School Bus Purchases." May 2021. https://stnonline.com/partner-updates/a-guide-to-locating-funding-for-electric-school-bus-purchases/ "Steps to Creating a Safe Routes to School Program" http://guide.saferoutesinfo.org/steps/index.cfm
- US Department of Energy. School Bus Idle Reduction Strategies. https://afdc.energy.gov/conserve/idle_reduction_bus.html
- U.S. Environmental Protection Agency. "Idle Free Schools Toolkit." https://www.epa.gov/schools/idle-free-schools-toolkit-healthy-school-environment
- U.S. Environmental Protection Agency. "SmartWay Verified List of Idling Reduction Technologies (IRTs) for Trucks and School Buses" https://www.epa.gov/verified-diesel-tech/smartway-verified-list-idling-reduction-technologies-irts-trucks-and-school

Sources of Data Referenced

- Hanis, Monique. “Maryland’s Montgomery County Public Schools to Procure Largest Electric Bus Fleet in Nation with Budget-Neutral Contract.” https://www.aee.net/articles/aee-applauds-mcps-highland-electric-school-bus-fleet-contract
- Multi-State Medium- Heavy-Duty Zero Emission Vehicle Memorandum of Understanding. https://www.nescaum.org/documents/mhdv-zev-mou_12-14-2021.pdf/
- Measuring Engine Miles to Hours to Improve Fleet Management. https://resources.lytx.com/blog/engine-hours-to-miles
- News Release: PGCPS to Receive Funding for Electric School Bus
- https://www.pgcps.org/offices/communications-and-community-engagement/newsroom/news/newsroom-archives/2019---2020/news-release-pgcps-to-receive-funding-for-electric-school-bus



Jack Bisnett, Imagine Andrews
2022 PGCPS EcoAction Art Contest winner
(Pre-K-2nd Grade South category)

Priority Recommendation #5: Reduce Food Waste and Grow Climate-Friendly Food

Studies reveal that roughly a third of the world's food is never eaten, which means land and resources used, and greenhouse gasses (GHGs) emitted, in producing it were unnecessary. Interventions at the source and in school buildings can reduce loss and waste.

Priority Recommendation #5: Reduce Food Waste and Grow Climate-Friendly Food outlines 3 Operational Actions, 2 Mitigation Actions, and 2 Adaptation Actions considered critical to supporting the goals of this recommendation.

> **"This generation of students stands to face the worst impacts of climate change if we don't act boldly and immediately. I'm inspired by their commitment and resilience, and I wanted to do what I could to contribute to a healthy and just world for their and future generations."**-- *Chloë Waterman, Program Manager, Friends of the Earth's Climate-Friendly Food Purchasing Program and Work Group Member*

Operational Actions

O1 Incorporate Student, Parent, Staff, and Community Stakeholder Input into PGCPS Menus

For any changes to PGCPS foodservice to be successful, students need to have buy-in, as well as parents, teachers, staff, and other community stakeholders. PGCPS faces challenges operating a large food and nutrition system for a diverse student body. If food is not consumed for any of numerous reasons, this comes as both a financial and GHG emissions cost to PGCPS. PGCPS Food and Nutrition Services (FNS) division already has a student advisory board that can be built upon to solicit the feedback it needs to make changes to the menu that mitigate and adapt to climate change while improving student meal satisfaction, meeting federal nutrition standards, and keeping meal costs financially sustainable.

Implementation Steps:

A. Continue to utilize FNS' student advisory board and incorporate CCAP goals into the board's mission. Recruit students from green clubs to be represented on the advisory board and focus on incorporating more plant-forward and plant-based options on the menu that students will be excited about. (O1.Food.A)
B. Incorporate food sampling across all schools for new plant-forward and plant-based menu items so that students have the opportunity to try climate-friendly foods before deciding which items to purchase. (O1.Food.B)

O2 Conduct Baseline Assessments for Food Waste and Values-Driven Purchasing

PGCPS will need to baseline and disclose data on its current levels of food waste, its food sourcing practices, and the GHG emissions associated with its foodservice. Ensuring a data-driven and transparent approach will be crucial to making measurable progress towards these goals while keeping stakeholders informed.

Implementation Steps:

A. Conduct a food waste audits following U.S. Environmental Protection Agency (EPA) or other best practices. (O2.Food.A)

B. Work with a external partners such as the Center for Good Food Purchasing to conduct and publicly share a baseline assessment of PGCPS, including: 1) spend on foods that are environmentally sustainable, 2) from a supply chain with a valued workforce, 3) sourced from local and Black, Indigenous, and people of color **(**BIPOC) producers, 4) humane, and 5) nutritious. (O2.Food.B)

Mitigation Actions

M1 Implement Values-driven, Climate-friendly Foodservice

Replacing some animal-based proteins with plant-based proteins is one of the two most effective strategies for reducing PGCPS' climate foodprint. Dozens of districts across the country (including New York City Public Schools, DC Public Schools, and Baltimore Public Schools) are implementing policies such as the Good Food Purchasing Program and meatless days to better align their foodservice with their values around climate change, racial justice, healthy eating, robust local economies, fair treatment of workers, and humane treatment of animals.

Implementation Steps:

A. Adopt the Good Food Purchasing Policy, a flexible, values-driven procurement policy that will gradually shift PGCPS' food purchasing toward more foods that are environmentally sustainable, humane, nutritious, local, from supply chains with valued work forces, and from BIPOC producers. (M1.Food.A)
B. Establish one plant-based or meatless day each week (e.g. Green Mondays, Plant-based Fridays) and conduct student outreach and education around the climate benefits of plant-forward eating. This could include adding climate ratings to various menu options. (M1.Food.B)
C. Provide professional development training and education to foodservice staff to ensure they are equipped to prepare the new menu items and understand their climate and health benefits. (M1.Food.C)

M2 Reduce Food Waste and Increase Composting

The other most effective strategy for reducing PGCPS' climate foodprint is to reduce food waste. PGCPS has already joined districts across the country and the region in taking actions to reduce food waste by utilizing offer vs. serve, share tables, food waste audits, and composting. PGCPS is poised to become a leader in both reducing the carbon footprint of its menus (while improving student health and meal satisfaction) and reducing food waste. It will also be necessary for some schools in the system to develop robust food rescue and composting programs in order to comply with legislation (HB 264) passed in the 2021 Maryland General Assembly.

Offer Versus Serve (OVS) - National School Lunch and Breakfast Programs
The goal of OVS is to reduce food waste and allow students to choose the foods they want to eat. Under OVS, students must select three meal components to ensure they get the nutritional benefits of a meal. In the OVS program, students are NOT required to take milk as part of their reimbursable meal. Milk is a common item found in the trash unopened and unconsumed. OVS is required for lunches served in high schools, but is optional in middle and elementary schools.

Posting a PGCPS Offer vs Serve policy and administrative procedure documents on the PGCPS website would clarify how schools can reduce school food waste through OVS and let the public know PGCPS is taking steps to reduce food waste. Implementing OVS at schools would mainly focus on education and changing practices, and could be done at little to no cost yet will substantially reduce wasted food at schools.

Food Share Table / Food Donation
Share Tables are designated stations where students may return whole and/or unopened food or beverage items they choose not to eat. These items are then made available to other students who may want or need another serving during or after the meal service. Share tables can include milk and other temperature sensitive items when stored at correct temperatures following food safety requirements.

Several PGCPS schools already have partnerships with local food banks or food pantries. Food donation to area food pantries is a natural fit with Share Tables as another way to minimize wasted food from our schools. This is an opportunity for schools to find local partnerships in their communities.

As detailed in the Capital Area Food Bank 2021 Hunger Report (page 9-10), residents who became food
insecure during the pandemic are notably different from those experiencing food insecurity before
the pandemic. Those newer to food insecurity are more likely to be Hispanic, employed, live in larger households with more children, fall into more severe levels of food insecurity, and be facing eviction.

"I am honored to be among a group of passionate and committed people who care deeply about the mission of the CCAP. When I was an elected official in Montgomery County my focus was on the environment and food insecurity. I was able to initiate the first Food Recovery Network in the country wholly funded by local government. I am really excited about the prospect of combatting hunger and keeping food out of landfills by feeding families with food that would be thrown away. This is something that we can accomplish. The CCAP has a plan to make this a reality. I am thrilled about the participation of young people and CCAP's focus on equity and inclusion. This is truly meaningful and exciting work." – *Valerie Ervin, Special Assistant to the Chief of Staff, PGCPS and Work Group Administrator*

Federal and State legislation eliminates liability for donor organizations and specifies that Maryland school districts can donate surplus food; Legislation includes the Bill Emerson Good Samaritan Food Donation Act of 1996 and MD HB 983 (2016) Public Schools -Food Recovery Programs-Authorization.

Implementation Steps:

A. Develop clear written guidance for schools, post the guidance on the PGCPS website and implement reduction strategies prioritized in the following order:
    a. Offer vs Serve - emphasizes student choice and reducing waste of unwanted food items.
    b. Food Share Table - feed our students.
    c. Reuse items from Share Tables for suppers or other meals as described in USDA Policy Memo SP41, CACFP13, SFSP15-2016.
    d. Food Donations to Community Organizations - contribute to reducing food insecurity in the County.
    e. Compost Food Waste - recycle nutrients and feed the soil. (M2.Food.A)

B. Establish Offer vs Serve, share tables, and food donation program to local food banks in all schools. (M2.Food.B)
C. If permitted by local and state health and food safety codes, serve items from the Share Table, that are kept at proper temperature, during another meal service. USDA permits Share Table items, when kept at proper temperature, to be claimed for reimbursement during another meal service in situations where it is necessary to prevent food waste, as described in USDA Policy Memo: SP41, CACFP13, SFSP15-2016: The Use of Share Tables in Child Nutrition Programs. This is currently in practice in other districts such as Oakland Unified School District https://www.stopwaste.org/sites/default/files/4-page-FoodShare-Layout_FINAL.pdf. (M2.Food.C)
D. Expand PGCPS' composting program to all schools and offices. This could include options for onsite composting or transportation of food materials to the Prince George's County Organics Composting Facility or a combination of both. Composting programs must include a learning element for the students and staff. Onsite composting bins should be provided to schools to utilize in lessons that teach students about composting; this direct hands-on experience with the composting process will increase student and staff understanding of and participation in the program. (M2.Food.D)
E. Conduct both targeted (food waste/organics) and broad (all school waste) assessments. As they are snapshots, they would need to be repeated. Additional staff and an external partner would be required. (M2.Food.E)

Resiliency Adaptation Actions

A1 Continue to Participate in Maryland's "Farm to School Program" and Expand Sourcing and Promotion of Locally Procured Foods

While purchasing local food typically does not have a significant climate mitigation benefit, a robust local food economy is important for climate adaptation and resilience. As natural disasters increase and we risk becoming cut off from national supply chains, local and regional food supply chains will become a crucial climate security measure.

Implementation Steps:

A. Utilize the new database the Maryland Department of Agriculture is creating for certified local farm enterprises interested in selling to Maryland institutions, including schools. (A1.Food.A)
B. Partner with community-based organizations to conduct environmental education around locally sourced foods offered in the cafeteria. (A1. Food.B)

A2 Create Resilient Food Production on PGCPS Properties

Producing food onsite has several resiliency benefits. For one it can be used as a learning tool for students so that they can begin to grow vegetables and fruits on their own. Secondly, if supply chains become weaker, onsite food production can both augment PGCPS's access to food for students and ease the impact of price fluctuations. Also children have been found to eat more fruits and vegetables if they are homegrown. (See data in Sources of Data Referenced.)

Implementation Steps:

A. New and retrofit buildings will be designed with localized food waste composting and designated land for food production, such as raised beds, and if possible greenhouses. (A2.Food.A)
B. Provide compost to participating schools to use in their school gardens and landscaping, so students see firsthand the benefits of composting and the product resulting from their efforts at school. Incorporate compost into PGCPS landscape applications. (A2.Food.B)
C. Allow students to participate in learning activities related to the onsite food production. (A2.Food.C)

Recommendation Number	Operational Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
O1 Food/Waste	Incorporate Student, Parent, Staff, and Community Stakeholder Input into PGCPS Menus	◉	◉	◉	◉	1+
O2 Food/Waste	Conduct Baseline Assessments for Food Waste and Values-Driven Purchasing	◉	◒	◒	◉	1-5

Recommendation Number	Mitigation Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
M1 Food/Waste	Implement Values-driven, Climate-friendly Foodservice	◉	◒	◒	◉	2-10
M2 Food/Waste	Reduce Food Waste and Increase Composting	◉	◉	◉	◉	2-10

Recommendation Number	Resiliency Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
A1 Food/Waste	Continue to Participate in Maryland's "Farm to School Program" and Expand Sourcing and Promotion of Locally Procured Foods	◉	◉	◉	◉	1-5
A2 Food/Waste	Create Resilient Food Production on PGCPS Properties	◎	◎	◒	◉	1-5

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Equity Considerations

Low-income students disproportionately rely on school meals as a primary source of nutrition. Since climate-friendly foods (e.g., whole grains, fruits, vegetables, and plant-based proteins) also tend to be healthier. Climate-friendly menus also have potential to improve student health outcomes, especially for the students who rely on PGCPS foodservice. Expanding plant-based options is also important from a rights-based perspective because students who do not eat meat or other animal products for religious, cultural, ethical, health or other reasons deserve to have options they can eat at school. For example, plant-based diets are growing most quickly among the African American population, so ensuring that climate-friendly, plant-based options are available at school meals helps to create an inclusive student meal program. Finally, equitable school foodservice should mean that those most impacted by the program should have a say in what the meals look like, which is why including ample student, parent, staff, and stakeholder feedback throughout the process is crucial.

Labor Partner Considerations

Shifting to plant-forward, scratch-cooked menus has the potential to lower food costs. Budgets can be shifted to labor costs, including hiring more staff and/or increasing pay to staff with scratch-cooking skills. Insofar as this plan includes food service staff professional development training, staff can benefit by learning new culinary skills and expanding their knowledge around the connection between food choices, food waste, and climate change.

Concerning composting, staff will need to be trained on proper handling and disposal of composting food waste in order to educate and supervise students in the correct sorting of materials and limit contamination. Ideally, staff and students would compost at their homes (either through their own on-site composting or local/county composting programs) and thus would help reduce the learning curve and ease the transition to composting in schools. Prince George's County is expanding their composting program for county residents and several municipalities also provide home collection of compostable materials.

Additional staff will be needed to serve as Waste Reduction Specialists supporting and promoting source reduction, reuse, recycling and composting programs. These specialists will educate and engage students and school staff in implementing composting and waste reduction programs and activities. Expanding the composting program in schools will require additional direct, hands-on support to each school to help with the initial startup, implementing best practices, and making the new procedures a part of the school routine.

Current PGCPS Highlights: School Based Composting Programs

Laurel Elementary School Composting

Laurel Elementary students are reducing waste sent to the landfill by collecting their food scraps and paper trays for composting. Through a partnership with the City of Laurel, the city provides compost collection containers, compostable bags, and pickup and hauling of the materials to the composting facility. The William S. Schmidt Outdoor Education Center provides a hands-on lesson (trash diversion, composting food waste and trash sorting) as well as training for the student monitors. The program started with students learning about composting through a hands-on lesson. Next, the students began sorting their food scraps during breakfast and then lunch time. Student monitors help their peers with the sorting process, which helps to reduce contamination in the compost bins. Through the support and partnership of the school staff, the Schmidt Center, and the City of Laurel, the students and staff at Laurel Elementary have been able to divert much of their breakfast and lunch waste from the landfill to be turned into compost. Scotchtown Hills Elementary has begun the program as well and will follow the same model.

Largo High School Composting

Thanks to Mr. Johnson, Green School Coordinator at Largo High School, the Green Team student compost crew at Largo High School has a video to share of their lunch time process of separating the compostable and recyclable materials.

Video Link: https://drive.google.com/file/d/1CFl1_4y7sZjaHNK57p7AhtDtwekxKnxc/view

Laurel High School Composting

On January 16, 2022, *Maryland Matters* highlighted PGCPS student Javier Fuentes, president of the Laurel High School Green Club, and his leadership of the composting program.

Article Link: https://www.marylandmatters.org/2022/01/16/laurel-high-school-students-eco-activism-has-global-reach/


MARYLAND MATTERS

GOVERNMENT & POLITICS ENVIRONMENT HEALTH EDUCATION JUSTICE TRANSPORTATION WORK & THE ECONOMY COMMENTARY

Laurel High School Student's Eco-Activism Has Global Reach

Implementation Team

Lead Agency

The Department of Food and Nutritional Services (FNS) will be the lead agency for continuing and expanding efforts to improve community input on menus, conduct the baseline assessment on purchasing, implement values driving, climate-friendly food service, efforts to right size food portions and production, and work to expand the use of the "Farms to Schools" program in PGCPS.

The Department of Food and Nutritional Services and the Department of Building Services will jointly develop and implement the food waste reduction policies and procedures.

Supporting Partners

The Department of Building Services will be needed to assist in conducting waste assessments and to expand composting programs.

Measurement and Tracking

O1 Incorporate Student, Parent, Staff, and Community Stakeholder Input into PGCPS Menus

1. Number of engagement activities on menus, percentage of parents and students participating, and breakdowns by grade level, race, gender, and board of education district.
2. Results of real life food rollout trials.

O2 Conduct Baseline Assessments for Food Waste and Values-Driven Purchasing

1. Being a baseline assessment the tracking consists of the assessment being completed. Additional tracking mechanisms for O1.Food, M1.Food, and M2.Food that results from this work should be added.

M1 Implement Values-driven, Climate-friendly Foodservice

1. Carbon footprint of food menus.
2. Total and percentage of meat-based and vegetarian meals consumed.

M2 Reduce Food Waste and Increase Composting

1. Total compostable waste by school in tons.
2. Percentage of food waste by type of food (e.g., meat, milk, vegetables, fruits), if possible, and if not random surveying should be employed (assuming funding is provided as recommended). For breakfast in the classroom programs, report the number and type of items unopened/uneaten and returned to the kitchen and participating number of students.
3. Total tonnage of materials (food, compostable trays, etc.) composted per school.
4. Total number of schools with active programs for: Offer vs Serve, share table, and food donation to food pantry. For food donation programs, report the total amount of food donated (weight or number of each item).

A1 Continue to Participate in Maryland's "Farm to School Program" and Expand Sourcing and Promotion of Locally Procured Foods

1. Number of schools participating in "Farms to Schools Program"

2. Total food procured and consumed.

A2 Create Resilient Food Production on PGCPS Properties

1. Total food produced.
2. Total acreage farmed.

Helpful Resources

- Bill Emerson Good Samaritan Food Donation Act of 1996 https://www.congress.gov/104/crpt/hrpt661/CRPT-104hrpt661.pdf Healthy Food Policy Project. https://healthyfoodpolicyproject.org/key-issues/zoning-for-urban-agriculture
- Historic Agricultural Resource Protection Program. https://www.pgscd.org/agricultural-land-preservation/harpp/
- Maryland Department of Agriculture. "Farm to School Program" https://mda.maryland.gov/farm_to_school/Pages/farm_to_school.aspx
- Maryland Department of Environment. "Food Waste Minimization and Related Activities A Toolkit for Maryland Schools." https://mde.maryland.gov/programs/LAND/AnalyticsReports/Food%20Waste%20Minimization%20and%20Related%20Activities%20--%20A%20Toolkit%20for%20Maryland%20Schools.pdf
- Maryland General Assembly. MD HB 264 2021 "Organics Recycling and Waste Diversion - Food Residuals" https://legiscan.com/MD/bill/HB264/2021
- Maryland General Assembly. MD HB 983 Public Schools – Food Recovery Programs – Authorization
- North Carolina Public Schools. "Meal Requirements under the National School Lunch Program and School Breakfast Program: Questions and Answers for Program Operators." https://childnutrition.ncpublicschools.gov/regulations-policies/usda-policy-memos/2019/sp.382019s.pdf
- Prince George's County Organics Composting Facility. https://www.princegeorgescountymd.gov/2667/Organics-Composting-Facility
- Prince William Food Rescue-PWCS Food Share Guide https://drive.google.com/file/d/1E8QLdLewoGma7sUZ5cM-BgOKCF5sdlfH/view?usp=sharing
- US Department of Agriculture. "The Use of Share Tables in Child Nutrition Programs" (Policy Memo: SP41, CACFP13, SFSP15-2016) https://www.fns.usda.gov/cn/use-share-tables-child-nutrition-programs
- US Department of Agriculture. Offer Versus Serve Guidance For the National School Lunch Program and the School Breakfast Program https://fns-prod.azureedge.net/sites/default/files/cn/SP41-2015av2.pdf
- US Department of Agriculture. Offer Versus Serve (OVS) Tip Sheet for School Food Service Managers - National School Lunch Program. https://www.fdacs.gov/content/download/84373/file/OVS%20Tip%20Sheet%20for%20Lunch%20Meal%20Services%20USDA-July%202019.pdf
- US Department of Agriculture. Offer Versus Serve (OVS) Tip Sheet for School Food Service Managers - School Breakfast Program. https://www.fdacs.gov/content/download/90967/file/OVS-Breakfast-Tip-Sheet.pdf
- US Environmental Protection Agency. "From Farm to Kitchen the Environmental Impacts of US Food Waste." https://www.epa.gov/system/files/documents/2021-11/from-farm-to-kitchen-the-environmental-impacts-of-u.s.-food-waste_508-tagged.pdf
- US Environmental Protection Agency. "Food Recovery Hierarchy." https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy

- US Environmental Protection Agency. “Guide to Conducting Student Food Waste Audits.” https://www.epa.gov/sites/default/files/2017-12/documents/guide_to_conducting_student_food_waste_audit_-_nov_20_2017.pdf
- World Food Council. “Policy Handbook: Advancing Education for Sustainable Development.” February 26, 2019. https://www.worldfuturecouncil.org/wp-content/uploads/2019/01/Handbook-ADVANCING-EDUCATION-FOR-SUSTAINABLE-DEVOLOPMENT-by-Alistair-Whitby-WFC_2019.pdf

Sources of Data Referenced

- Project Drawdown website https://www.drawdown.org/solutions/reduced-food-waste?mkt_tok=MjExLU5KWS0xNjUAAAGC9DW7SQSYBob5sQ25W2679GxUjGgUGOO0qPcvpb1m9t9Kuh3MTGcLPJeqh6h6Fo_W31WzYsmqcw3ZrTaRM9FsxpCUAz-5HGJD5TjViIcIiX7Gpsc
- Capital Area Food Bank. Hunger Report 2021. https://hunger-report.capitalareafoodbank.org/
- Prince George's County Food Security Task Force Recommendations 2021, pages 9-10. https://pgccouncil.us/DocumentCenter/View/6996/PGCC-FSTF-Report_ONLINE2022
- Children Eat More Fruits And Vegetables If They Are Homegrown (or school grown) https://www.sciencedaily.com/releases/2007/04/070418163652.htm
- Laurel High School Student’s Eco-Activism Has Global Reach https://www.marylandmatters.org/2022/01/16/laurel-high-school-students-eco-activism-has-global-reach

Priority Recommendation #6: Commit to Sustainable Materials Management and Procurement

In order to effect true change to our waste streams, we need to focus on behavior change and developing a 'green' culture that becomes part of our routine practices and behaviors. Policies and procedures can help PGCPS purchase more sustainable materials and products, but behavior change is needed to make proper disposal and correct sorting of waste materials the routine practice. Reducing waste sent to the landfill, and thus the environmental impact, depends on the collective choices of all students and staff to reduce, reuse, and correctly recycle.

Each day every student and staff member (both central office and school based) makes choices on how they will dispose of waste materials. Students need to see staff practicing green choices and modeling green behaviors in everyday actions. Choices of the staff in what to purchase and how to dispose of those items both directly and indirectly influence students' choices.

> **"Trash affects us in many ways. Source reduction and recycling reduces the trash all around our neighborhoods, in our communities and our public areas where we visit and play. It affects the air we breathe, the water we like to fish and play in and hurts animal habitats. It is up to us to not harm the environment and animal habitats with effective trash reduction and recycling programs."** -- *Ja'bari Woodberry, PGCPS Class of 2023, Fairmont Heights High School and Work Group Member*

Priority Recommendation #6: Commit to Sustainable Materials Management and Procurement outlines 3 Operational Action and 2 Mitigation Actions considered critical to supporting the goals of this recommendation. No direct Adaptation Actions are outlined under this recommendation.

Operational Actions

O1 Develop a Sustainable Purchasing Policy

A variety of purchases are made for school systems to properly function. Even the most technological school systems rely on large amounts of paper and other office supplies. Additionally, Food and Nutrition Services (FNS) relies on utensils, trays, and other items for safely providing food to students. In order for staff to make environmentally friendly purchasing decisions, the first step is to have a policy in place to prioritize such decisions and make them automatic.

The sustainable purchasing policy should include an 'end-of-life" consideration including how the item to be purchased will be disposed of in the future and disposal costs for the item should be factored into the true cost of the item.

Implementation Steps:

A. Develop a sustainable or 'green' purchasing policy.
    a. Distribute sustainable procurement guidelines to all staff and post on the Purchasing website and within the PGCPS Oracle procurement portal.
    b. Integrate sustainable purchasing policy into PGCPS contracts and vendor registration information on iSupplier, review and update yearly. (O1.Waste.A)

B. Reduce packaging from shipments to PGCPS. Require PGCPS' largest vendors to reduce packaging and prioritize paper packaging (including fill materials) that can be recycled in PGCPS recycling bins over plastic packaging (air pillows and bubble wrap) that cannot be recycled in PGCPS recycling bins. (O1.Waste.B)

O2 Reduce School Meal Packaging Sent to the Landfill

Much of the waste disposed of in school dumpsters each day is related to school meals in the form of food, packaging, preparation and serving materials. With each meal PGCPS serves, we have an opportunity to teach and model responsible waste management and resource conservation simply by utilizing environmentally friendly materials and practices.

Follow reduce, reuse and recycle strategies by eliminating unnecessary packaging, utilizing reusables, reducing the amount of packaging, and choosing compostable or recyclable packaging (that can be recycled in PGCPS recycle bins) over items that must be sent to the landfill.

Implementation Steps:

A. Eliminate or reduce unnecessary packaging by:
    a. Serving food items directly on the lunch tray, not in containers placed on the lunch tray.
    b. Replacing the spork packet with individual compostable sporks, napkins, and straws. Individual sporks and napkins eliminates the need for students to take another spork packet when they need an additional napkin or do not need the spork.
    c. Utilizing sauce dispensers instead of sauce packets. The sauce packets are a common contaminant in recycling bins. For composting schools, eliminating the sauce packets will make sorting easier for students and eliminate the potential for the sauce packets to contaminate the compost collection bin. (O2.Waste.A)
B. Transition to compostable food containers for all meal items packaged and served by FNS, including utensils, bags, and serving boats. In addition to reducing landfill trash, this will support the composting program by making sorting faster and easier for students. Items packaged offsite would be exempt unless a compostable alternative is available. (O2.Waste.B)
C. When compostable containers are not available, choose containers that can be recycled in PGCPS recycling bins (plastic containers #1, 2, 3, 5, or 7; metal cans, uncoated paper and cardboard) and prioritize containers with recycled content. (O2.Waste.C)
D. Eliminate use of #4 and #6 plastics as they cannot be recycled in Prince George's County. (O2.Waste.D)
E. Reduce or eliminate use of plastic bags and plastic wrap, as these items cannot be recycled in PGCPS recycling bins. (O2.Waste.E)
F. Provide professional development training and education to school staff (foodservice staff, administration, teachers, etc.), at least once per year, to ensure all are aware and able to implement the foodservice changes and understand how to properly dispose of the materials.
G. Conduct a study to evaluate the impacts of implementing reusable trays, utensils and other items in PGCPS. (O2.Waste.F)

O3 Promote Recycling and Waste Reduction in PGCPS

The end goal of improving waste cycles is to send increasingly less, and eventually zero waste, to the landfill. To do this, there is a need to both reduce at the source and divert the remaining waste to recycling. While purchasing decisions by PGCPS can and will make a difference, a large amount of this change needs to come from behavior changes from staff and students.

Implementation Steps:

A. Integrate solid waste management education into the PGCPS elementary, middle, and high school curricula, including reduction, reuse, recycling, and composting. (O3.Waste.A)
B. For schools that meet safe drinking water standards, eliminate single-use bottled water and, instead, utilize water bottle refill stations already in schools and facilities (add more if needed) and encourage/promote use of reusable bottles. (O1.Waste.B)
C. Incorporate school waste data into student lessons and STEM activities. (O3.Waste.C)
D. Continue to support and encourage student participation in school Green Teams or Environmental Clubs, Maryland Green Schools, and other programs in which students actively participate in reducing waste at their schools. (O3.Waste.D)
E. Promote and encourage 'green choices' to reduce solid waste and become part of the PGCPS culture. Educate staff on 'green' practices such as reducing waste and include an element of this in yearly staff meetings. (O3.Waste.E)
F. Promote and facilitate opportunities for educational tours of the recycling facility, composting facility, and landfill.
    a. Encourage more schools to fund and take students on field trips to these facilities;
    b. PGCPS Staff tours
        i. Continue professional development workshops at the recycling facility for teachers and custodians; Expand opportunities to include principals and other staff.
        ii. PGCPS executive and school leadership teams should tour these facilities to see firsthand what the problem is and what the solutions are. (O3.Waste.F)
G. Promote source reduction, reuse, recycling and composting programs by providing additional staff to serve as Waste Reduction Specialists. These specialists will educate and engage students and school staff in implementing composting and waste reduction programs and activities. Expanding the composting program in schools will require additional direct, hands-on support to each school to help with the initial start up, implementing best practices, and making the new procedures a part of the school routine. (O3.Waste.G)
H. Develop and execute a communications plan to increase the promotion of recycling and waste reduction to staff, students, and families via PGCPS newsletters, website, and other methods. Communications should be at least quarterly. (O3.Waste.H)
I. Highlight zero-waste features and practices at PGCPS events, schools and buildings, and departments. (O3.Waste.I)
J. Establish zero waste guidelines for all PGCPS events, including school parties, catered events and athletic events. (O3.Waste.J)

Mitigation Actions

M1 Improve the Carbon Footprint of the Waste Collection System

Though waste materials often get associated with filling up landfills or finding its way into nature as litter, materials of all types have a carbon footprint. Materials from virgin materials often have higher carbon footprints than those made with recycled content and different materials have different levels of carbon emissions due to manufacturing approaches and transportation. Additionally, there is a carbon footprint associated with disposal of waste, such as is required to transport materials to a landfill (note that refuse vehicles often get poor gas mileage). As a result, it is important to reduce the carbon footprint of the materials used by PGCPS as part of a holistic effort to eliminate its carbon emissions.

Implementation Steps:

A. Continue to utilize "On-Demand" collection services for recycling dumpsters using sensors in the recycling dumpsters that monitor fill levels so that:
    a. Collections are individualized for each site based upon their dumpster fill rate, and adapt quickly to changes;
    b. Dumpsters are emptied when needed (vs the standard practice of a set collection schedule), reducing the number of collections of empty or partially empty dumpsters. (M1.Waste.A)
B. Utilize trash bags with recycled content (M1.Waste.B)
C. Purchase collection containers with recycled content, when available. (M1.Waste.C)
D. Implement three waste collection streams (landfill, compost, recycling) in areas where meals are eaten, a fourth for liquids with straining when possible, and two waste collection streams (landfill, recycling) in all other areas. Note that liquids, in particular milk, cannot be placed into the drain without a specific system in place at the school due to limitations placed on disposal by WSSC. All new school construction should have a cafeteria liquids disposal system included in the construction plans. (M1.Waste.D)

M2 Expand Tracking of Waste and Diversion Rates

In order to develop better policies for reducing landfill waste, improve the food system to reduce food waste, and even limit the amount of fuel wasted to visit sites not in need of having waste removed, tracking is key.

PGCPS has begun to explore use of sensors in recycling dumpsters that monitor fill levels and calculate recycling amounts. The goal is to utilize the sensors to provide site specific data for each PGCPS location's recycling dumpster. PGCPS is conducting a small pilot of sensors in trash dumpsters; This pilot should be expanded to all trash dumpsters in order to capture data for each PGCPS facility trash dumpsters.

Implementation Steps:

A. Track and report waste diversion rates for PGCPS overall and for each PGCPS facility to drive waste reduction. Data will come from dumpster based sensors and sensors will be needed for each location and for each type of dumpster (e.g., landfill, recycling). Diversion rate measures the portion of waste not sent to the landfill, and involves gathering data on items that are reused, recycled, composted, or landfilled. (M2.Waste.A)
B. Develop and implement a process for individual schools and departments to report reduction, reuse, and recycling data and actions that they participate in (ex: take-back or

drop-off programs such as plastic bag recycling, ink and toner cartridge recycling) that cannot be tracked through typical PGCPS disposal methods such as dumpsters. All areas of the PGCPS waste stream should be included. (M2.Waste.B)

C. Following the data collection process, conduct a comprehensive analysis of the PGCPS waste stream through waste assessments. These comprehensive studies will give PGCPS necessary insights into specific areas for improvement within waste streams that cannot be obtained via weight data tracking alone. Dedicated funding must be provided to perform these comprehensive waste assessments as they are time intensive. Waste Assessments should be repeated every 3-4 years. (M2.Waste.C)
D. Post data on PGCPS website to give feedback to schools and departments on their waste diversion efforts and promote additional reductions. (M2.Waste.D)

Recommendation Number	Operational Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
O1 Other Waste	Develop a Sustainable Purchasing Policy	◉	◉	◉	◉	1-2
O2 Other Waste	Reduce School Meal Packaging Sent to the Landfill	◉	◒	◒	◉	1-2
O3 Other Waste	Promote Recycling and Waste Reduction In PGCPS	◉	◉	◉	◉	2-5

Recommendation Number	Mitigation Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
M1 Other Waste	Improve the Carbon Footprint of the Waste Collection System	◉	◉	◉	◉	1-3
M2 Other Waste	Expand Tracking of Waste and Diversion Rates	◉	◉	◉	◉	3-10

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Equity Considerations

The pilot programs and the roll out of new programs and waste reduction techniques should be done equitably throughout the system.

Given diesel emissions from waste transportation vehicles pollute school neighborhoods, reducing waste pick up needs could result in slight improvements in air quality in the surrounding communities.

Labor Partner Considerations

Promote source reduction, reuse, recycling and composting programs by providing additional staff to serve as Waste Reduction Specialists. These specialists will educate and engage students and school staff in implementing composting and waste reduction programs and activities. Expanding the composting program in schools will require additional direct, hands-on support to each school to help with the initial start up, implementing best practices, and making the new procedures a part of their routine.

Funding will be needed to conduct a study to evaluate the impacts of implementing reusable trays, utensils, and other items in PGCPS.

Implementation Team

Lead Agency

The Department of Building Services will be the lead agency in regards to this effort.

Supporting Partners

The Department of Food and Nutrition Services (FNS) will be responsible for implementing changes to reduce school meal packaging sent to the landfill, including obtaining compostable packaging and other items, as well as providing professional development training and education to foodservice staff.

The Department of Purchasing and Supply Services will be responsible for developing a sustainable purchasing policy in collaboration with the Department of Building Services. Additional outside partners may also be needed.

The Department of Communications and Community Engagement will be responsible for implementing the communications plan that includes promoting recycling and waste reduction in PGCPS to students, staff, and families, as well as highlighting zero waste features and actions at PGCPS events, promoting zero waste guidelines for events, and creating a dynamic webpage for waste diversion data. (O3.Waste)

Curriculum and Instruction, the STEM office, and the William S. Schmidt Outdoor Environmental Education Center will be responsible for integration of waste management education into the PGCPS elementary, middle, and high school curricula and incorporation of school waste data into lessons and STEM activities with students.

Measurement and Tracking

O1 Develop a Sustainable Purchasing Policy

1. Percentage of goods purchased in accordance with the sustainable purchasing policy.

O2 Reduce School Meal Packaging Sent to the Landfill

1. For each type of compostable food container utilized in schools, provide a count of the number of schools utilizing each container.
2. List each item purchased by PGCPS to package and serve school meals and the eco-friendly alternative being used (eliminate item, reusable, compostable, recyclable).
3. For school meal packaging, percentage of packaging that is compostable, recyclable (in PGCPS recycling bins), and landfill trash. Also provide the percentage of meal items that are packaged onsite vs prepackaged.
4. Number of spork packets purchased vs the number of individual sporks and napkins purchased, with a count of the number of meals served.

O3 Promote Recycling and Waste Reduction in PGCPS

1. Tonnage of materials recycled.
2. If tracking systems can be reasonably used, gallons of water that are distributed using refillable water stations.
3. Reams of paper used.
4. Number of tours.

M1 Improve the Carbon Footprint of the Waste Collection System

1. Number of schools with triple waste stations.
2. Tonnage of recycling by school.
3. Tonnage of landfill waste by school.

M2 Expand Tracking of Waste and Diversion Rates

1. Waste Diversion rates.

Helpful Resources

- Golkhale, Maia and Phoebe Beierle. “Healthy Green Purchasing for Asthma Prevention.” https://build.usgbc.org/l/413862/2020-10-06/s4ng6j/413862/1601988089YGRwI8yH/Healthy_Green_Purchasing_for_Asthma_Prevention_Guidebook.pdf
- Maryland General Assembly. MD HB 264 2021 “Organics Recycling and Waste Diversion - Food Residuals” https://legiscan.com/MD/bill/HB264/2021
- All Prince George’s County Public Schools and facilities are required by the Maryland Code, Educational Article §4-127 to develop and implement a recycling program to recycle solid waste.
- Minnesota Pollution Control Agency. The Cost and Environmental Benefits of Using Reusable Food Ware in Schools https://www.pca.state.mn.us/sites/default/files/p-p2s6-16.pdf
- School Nutrition Foundation. “Life Cycle Environmental and Cost Analysis of Disposable and Reusable Ware in School Cafeterias, Including Dishwasher Operation.” https://www.thegreenteam.org/wp-content/uploads/2014/04/Warewash_Study-Summary.pdf
- National Association of State Procurement Officials. “Green Purchasing Guide.” https://www.naspo.org/green-purchasing-guide/

- Maryland Green Purchasing - Department of General Services website (includes related legislation and best practices manual) https://dgs.maryland.gov/Pages/GreenPurchasing/About/Legislation.aspx
- Council Bill 5-2015 bans the sale and use of expanded polystyrene, commonly known as “Styrofoam,” food containers by food service businesses and the retail sale of these containers. It took effect on July 1, 2016.
- Council Bill 52-2019 Bans single-use straws and stirrers that are not home-compostable. It took effect on July 1, 2020.
- PGCPS Recycling Webpages www.pgcps.org/recycling
- Reuse Wins: The environmental, economic, and business case for transitioning from single-use to reusable in food service https://upstreamsolutions.org/reusables-win-in-sf
- SCS Engineers. “Zero Waste Initiatives for Prince George’s County Maryland.” https://www.princegeorgescountymd.gov/DocumentCenter/View/21910/Zero-Waste-Initiative-Final-April-5-2018a
- US Environmental Protection Agency. “Waste Management Hierarchy.” https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy

Priority Recommendation #7: Commit to Climate Resilient Land Management

PGCPS operates 255 schools, centers, administration buildings and bus lots, totaling nearly 20 million square feet of buildings, encompassing 3,400 acres of land. Much of this PGCPS property is covered by impervious surfaces – buildings, sidewalks, asphalt driveways and parking lots. Turf for playing fields is rated 0.25 impervious, though heavily compacted turf contributes greater runoff. The extent of impervious surfaces throughout the school system presents a distinct challenge for meeting County climate goals.

For instance, the CCAP recommends that the County take a "no net loss" approach to maintain the current tree canopy of 52% (CCAP Priority Recommendation M-11). The county's land use practices are failing to meet this target, as the County has lost over eleven square miles of tree canopy between 2014-2018. Given the extents of buildings, parking and athletic fields required for schools, a "no net loss" policy will at best preserve a tree canopy ratio that is well below the 52% target. Substantive changes are needed to the way we plan and develop new schools, but perhaps the greatest challenge is changing how we manage the environmental resources embedded in our existing schools.

> **"I'm inspired by the students, teachers and facility managers who are 100% committed to the outdoor classroom learning, with its focus on sustainable stormwater treatment and native planting. Every school can be a demonstration of what is possible when we work together for a climate-ready future."** --*Marita Roos, RLA, Principal, UrbanBiology LLC, Neighborhood Design Center (Retired) and Work Group Member*

At present, 88 schools out of 208 schools and centers in the PGCPS system report flooding issues. Some school flooding may be correctable with careful analysis and green infrastructure design, but others will require more extensive remediation. Moving forward, PGCPS will need to seek every opportunity to mitigate stormwater runoff and urban heat islands by developing more sustainably, and by managing existing school landscapes differently.

Achieving climate goals for stormwater and land management requires that PGCPS align their actions internally throughout the school system, and externally with County operations in other departments, such as Department of Permitting, Inspections and Enforcement (DPIE), Department of Public Works & Transportation (DPW&T) and Department of the Environment (DoE). This represents a significant change to operations and will require commitment to specific, trackable actions that are implemented from the ground up and supported at every level of authority. It is particularly important to involve employees at all levels of operations, including principals, teachers, facility managers, inspectors, groundskeepers and administrative staff, as well as interested parents, students and community green team members.

Community engagement was evidenced by responses from the PGCPS Climate Change Action Plan survey, conducted in Fall 2021. Respondents were educators, students and parents from the PGCPS community, many of whom articulated deep concerns about neighborhood flooding, loss of forests and the loss of nature to future generations. Community members expressed a strong interest in climate goals tied to green stormwater management, advocating for bioretention, porous paving, tree planting, conversion to native plants and outdoor classrooms.

Priority Recommendation #7: Commit to Climate Resilient Land Management outlines 4 Operational Actions, 4 Mitigation Actions, and 4 Adaptation Actions considered critical to supporting the goals of this recommendation.

As the committee developed these recommendations, we have tried to avoid overly general suggestions that do not address the current reality of fragmented programs and lack of accountability for environmental outcomes. For example, a recommendation to plant a certain number of trees yearly is not accountable given the current process, where tree planting decisions are made incrementally, one school, one program and one employee at a time. System-wide commitment to this climate policy, with buy-in at every level of staffing and management, is needed; otherwise routine decision-making will continue to impede policy action. Constant engagement with supportive individuals - parent organizations, Green Teams and local elected officials – is essential to build a culture of stewardship that will support decisions and actions needed to make this plan a reality.

Operational Actions

Given the sheer magnitude of the issue, Operational Actions at a system-wide scale are necessary to meet equity goals and to shift the needle toward sustainability. The main focus is on how school grounds are managed and how this process can be redirected to achieve climate goals, with community engagement and stewardship-based environmental curriculum key to the process. One necessary systemic change is the review and inspection process where new construction – including tree planting and outdoor classrooms – are subject to the same permitting and approvals process as building projects of far greater magnitude. Many feel this process is unnecessarily cumbersome and expensive and should be revisited in the light of the urgent level of action needed to address climate change.

O1 Conduct a System-wide Landscape Inventory and Develop a Plan for Green Infrastructure & Sustainable Landscape Management Assets at Every School

At present, around 40% of PGC schools currently report flooding issues. The extent of school impervious surfaces also has negative climate impacts to surrounding neighborhoods. Creating a plan for every school that identifies areas for green infrastructure planting and conservation landscaping will facilitate PGCPS climate goals and provide a basis to improve conditions for local communities. Most schools and facilities have leftover spaces between and around their parking lots, athletic fields and driveways, as well as areas near the property boundaries that aren't used. These areas may also be steeper or wetter sites that, if sustainably managed, could reduce flooding and contribute to overall climate goals.

Grounds management decisions made over time have resulted in simplified landscape maintenance and decreased expertise, as groundskeeper positions have been eliminated from the PGCPS operation and budget. Artificial turf, considered impervious surface, has replaced mown grass in many athletic fields throughout the PGCPS system. While the Maryland Association for Environmental and Outdoor Education (MAEOE) Green School programs have advocated for and implemented conservation landscaping at 139 schools is a very positive trend, at present, small habitat areas created by teachers and students are often mowed or demolished if appearance or lack of summertime maintenance becomes a concern. Integrating these projects into an asset-based landscape management program will help ensure their survival and help engage the community throughout the year. Converting little-used natural turf areas to meadow or woodland will save maintenance time, money and reduce the fossil fuels used by mowers.

Concerning the potential for training needs the Chesapeake Bay Landscape Professional program offers low-cost training sessions several times per year to equip site management professionals to practice a stewardship approach. The Department of the Environment offers a 1 ½ day contractor training course twice a year to train professionals to manage small-scale green infrastructure projects funded by their Rain Check Rebate, which could also serve as a basis for training school facilities staff.

Implementation Steps:

A. Fund and develop a database of landscape assets on school grounds in order to generate online dashboards and reports for educators, grant funders and public agencies. Software can be obtained at low cost from ESRI online. This should be done in conjunction with O2.StormWater.A. (O1.StormWater.A)
B. Students and educators at secondary level add information from class exercises and on-ground observation to the data sets developed in O1.StormWater.A. (O1.StormWater.B)
C. Build capacity in maintenance of green spaces by:
    a. Restore funding to groundskeeper positions and ensure the staff is trained in the latest practices in management of natural landscapes; and
    b. Training facility personnel in current green infrastructure & conservation landscape management best practices. (O1.StormWater.C)
D. Engage with subject experts, school and community green team members, and parents to help identify suitable management methods for school grounds. (O1.StormWater.D)

O2 Establish a System-wide Project Database, with Tracking and Monitoring, for all Green Infrastructure and Conservation Landscape Assets

A database of monitored projects from all schools, collecting and exhibiting stormwater and planting data online, would track the full range of green infrastructure benefits. A publicly-accessible dashboard would keep communities engaged and provide updated metrics needed for grant opportunities. Utilizing an asset-based approach for green infrastructure and conservation landscapes places these green assets on the same footing for life-cycle tracking and maintenance as building assets, furnishings and other tangible items. The asset approach has begun to be used widely by municipal utilities such as DC Water to optimize their systems performance and structure staff training.

Students, educators and community green teams could assist with database logging and management as part of citizen science and stewardship. The Maryland Green Schools in the PGCPS system are already doing this through class observations of life-cycle events, such as plant blooms, seed set and pollinator visits. Areas placed into conservation landscaping, extents of steep slopes converted to woodlands, size, species and quantity of trees planted could be added to the database and tracked seasonally. Cost impacts of maintenance changes and volumes of stormwater mitigated could be derived from the data and used to support grant funding for program enhancements.

Implementation Steps:

A. Fund and develop a database of green infrastructure assets to coordinate observational data and generate online dashboards and reports for educators, grant funders and public agencies. This should be done in conjunction with O1.StormWater.A. (O2.StormWater.A)

B. Train facilities managers, students, educators and volunteers on green infrastructure asset monitoring consistently to report observations and issues can be flagged readily. (O2.StormWater.B)

O3 Incorporate Stormwater Management Activities into School Curriculum to Enhance Climate Science Literacy and Support a Culture of Environmental Stewardship

PGCPS Prototypical Educational Specifications support outdoor education. “Consider the entire school grounds as a teaching opportunity, with a central space as the outdoor learning area or classroom.” Training and motivating educators and facility managers to enable outdoor learning is at the core of the Treating and Teaching (T&T) Program. Treating and Teaching is limited to schools - currently numbering 55 - that have received stormwater BMPs (Best Management Practices or green infrastructure) through the Clean Water Partnership Program (CWP). Linking outdoor classrooms and learning initiatives to sustainable stormwater facilities should be implemented throughout the PGCPS system, as more schools receive green infrastructure. Site mapping and identification of green infrastructure opportunities, incorporated into science curriculums at a system-wide level, helps achieve Maryland Environmental Literacy Standards and Next Generation Science Standards. A booklet published by the University of Maryland with funding from the U.S. EPA outlines a curriculum of stormwater management lesson plans, suitable for grades 3-12. Lessons include site inventory, site analysis, soils, hydrology, stormwater runoff and green infrastructure techniques such as green roofs, rain gardens, permeable pavement and infiltration.

Stormwater management asset plans created by school facility managers can help direct and coordinate native planting efforts such as Arbor Day Every Day (ADED), as well as volunteer-driven work through Growing Green with Pride events hosted by the County Executive, and independent school greening initiatives. An approach that integrates the volunteer initiatives into school curriculum through a system-wide lens will coordinate these fragmented programs, leading to better engagement between educators, facility managers, students, and parents, and ultimately supporting a culture of environmental stewardship.

Implementation Steps:

A. Explore opportunities for incorporating stormwater curriculum into the system-wide curriculum. (O3.StormWater.A)
B. Ensure that parents and community members are kept informed and engaged through students’ learning and school outreach to the community. (O3.StormWater.B)

O4 Streamline the Review Process for Green Infrastructure Projects and Separate the Review Process from the Current Site Permitting Process

Green infrastructure and outdoor classroom projects are very small by development standards, typically only a few hundred square feet. The normal permit process places outdoor classroom and planting projects in the same pipeline as much larger site development projects. This inefficiency of scale is frustrating at every stage, with project advocates experiencing months of delays, missed deadlines and jeopardized funding. A partnership approach under the umbrella of this climate action plan is essential to expediting site-based school projects and promoting sustainable landscape management.

PGCPS and Department of Permitting, Inspections and Enforcement (DPIE) should create designated permit reviewers for green infrastructure projects, outdoor classrooms and tree planting initiatives. These reviewers will be fully informed about the CCAP and committed to

system-wide climate change and sustainability goals. Permit reviewers should be able to answer this question: “how can I move this project forward to meet climate action goals?” as the first step in the review process. The goal is to move away from a restrictive process focused on a single school or site, to one where inspectors and reviewers with system-wide knowledge are encouraged to evaluate projects based on how each contributes to overall climate readiness.

Implementation Steps:

A. Create a new or revamped position for a permit reviewer/inspector for education-centered and climate action projects, most specifically green infrastructure projects. (O4.StormWater.A)
B. Conduct training supporting climate knowledge and solutions-based approach to implement green projects and management methods. (O4.StormWater.B)
C. PGCPS administrators and leaders create strong, positive messages around the CCAP and incentivize managers, reviewers and inspectors with training and support. (O4.StormWater.C)

Mitigation Actions

Climate mitigation efforts are already happening at PGCPS schools, though not at a coordinated, monitored and tracked system-wide level. The Treating & Teaching program organized by Anacostia Watershed Society leverages green infrastructure implemented through the Clean Water Partnership into curriculum and outdoor classrooms for five to six schools per year. The multiple County programs, which lean heavily on teacher commitment and volunteer efforts vary in terms of their sustainability. Integrating these mitigation efforts into a climate-focused operational framework strengthens current program effectiveness and suggests opportunities for expanded networking and funding.

M1 Plant More Trees at Each School and Across the School System

Planting trees as part of an urban forest contributes to stormwater management and runoff control in a number of ways. Trees intercept rainwater and transfer water to the atmosphere through evapotranspiration, Shade and leaf litter underneath trees promotes infiltration to tree roots, which uptake water into the tree. Leaf litter reduces the volume and slows the rate of runoff, which decreases flood severity. Water volumes managed by trees vary according to the tree maturity, site condition and other factors; a study notes that increasing tree canopy and associated permeable planting area by 50% resulted in a 10% to 30% decrease in runoff volume. Another study by the University of Maryland notes that single trees planted in turf have a much greater transpiration rate than closed canopy or clustered trees.

Planting trees, expanding tree cover and creating new tree canopy is a key recommendation of the CCAP (M-11)). Currently, tree planting at County schools relies on a shifting set of program funding, directed by various agencies and organizations, and supported by volunteer planting teams. Typically, 150-200 trees are planted in any given year from all of these programs together, less than one tree per school for the 208 schools in the system. Given the multiple co-benefits of tree planting in addition to stormwater mitigation - improved public health, CO2 reduction, wildlife habitat, community greening - planting trees wherever feasible is a vital and necessary component of the CCAP.

County Tree Planting Programs for Schools

Program	Last year reported	# schools*	# trees planted
Growing Green with Pride	2021	50	90
Arbor Day Every Day (ADED)	2019	7	30
County Arbor Day (school site)	2019	1	25
Treating & Teaching	2019	3	15
Total # yearly all programs		61*	160

* schools may participate in more than one program

Participation in the programs is usually organized by a principal or environmental sciences educator, supported by a Green Team or parent's group. Growing Green with Pride has a simple application and benefits from over a decade of participation and the commitment of the County Executive. Arbor Day Every Day (ADED), administered by DOE, is a worthy program, but the acceptance process may deter applications from schools with constrained administrative capacity. ADED also provides trees for the Treating and Teaching program, which has an equity focus to ensure that deserving schools with limited capacity can apply successfully for the program.

Eleanor Roosevelt High School, Growing Green with Pride Event

Photo Credit: Neighborhood Design Center

Implementation Steps:

A. PGCPS executives and administrators should commit to a large-scale grant application and operational rollout to plant at least 1,000 trees per year over a five-to-eight year period. (M1.StormWater.A)
B. Partner with the County Department of Public Works & Transportation (DPW&T), Department of Environment (DoE), and the Parks & Recreation Department (under M-NCPPC) on a coordinated program to procure and plant significant numbers of trees at schools. (M2.StormWater.B)
C. Facility managers for each school should oversee tree plantings and coordinate planting through existing County programs which rely on established community-school networks of volunteers. (M3.StormWater.C)
D. Explore funding opportunities to reduce the costs to PGCPS such as grant funding through the Prince George's County Stormwater Stewardship Program and the Urban Tree Program offered by The Chesapeake Bay Trust (CBT). (M3.StormWater.D)

M2 Plant Native Plants and Create Conservation Landscapes for Stormwater and Multiple Benefits.

Planting native plants at schools is a goal of the Maryland Green Schools Program, a program encouraging environmental learning through hands-on stewardship activities. The program notes that Green School communities, with thousands of acres of grounds, represent a significant opportunity to improve environmental sustainability. Educational training aimed at students has a collateral benefit of educating parents about green practices and backyard-scale landscape management. The message is clearly taking hold, as survey responses from parents and community members advocate native planting for stormwater management, air and water quality and local wildlife habitat.

Growing Green with Pride (GGWP) is the latest version of a County-wide program, led by the Office of the County Executive, with support from many departments and agencies. Excellent resources and guidelines for planting natives in this area are available. The Chesapeake Bay Landscape Professional training is taught in this region several times a year. The operational actions recommended above – sustainable landscape management, curriculum-based stewardship and community engagement – will help coordinate the efforts of standalone volunteer-driven programs into an effective climate strategy engaging the entire school community.

Implementation Steps:

A. PGCPS executives and administrators should promote school-based green infrastructure, identify partners, and support grant opportunities. (M2.StormWater.A)
B. Identify funding sources through conservation & stormwater grant programs to expand the number of native plantings. (M2.StormWater.B)
C. Train facilities managers, grounds staff, and community green team leaders to manage eco-landscapes. (M2.StormWater.C)

M3 Increase the Number of School-Based Green Infrastructure Projects

The Clean Water Partnership (CWP), partnered with the Department of Environment (DoE), is continuing to install green infrastructure Best Management Practices (BMPs) at qualifying schools. As of February 2022, CWP has installed devices at 56 school sites across Prince George's County treating 55 acres of stormwater runoff; helping the county achieve its overall

MS4 permit requirements and adding to the 4,108 impervious acre credits for which the CWP is responsible. Understanding that these sites are only a small portion of the CWP's stormwater goals, it is important to note the additional benefits of these BMPs.

CWP green infrastructure projects provide real-world educational opportunities, supporting environmental literacy for students, parents and communities. The program also comes with a 30 year maintenance commitment and ongoing collaboration with school staff. The CWP is continuing to install BMPS across the school system at a rate of about 5 a year, but there are over 200 schools across the county and numerous students left to reach. Implementing this program throughout the PGCPS system would dramatically increase the benefits and allow greater distribution in the school network.

Laurel Elementary & Riverdale Elementary Arbor Day Events

Photo Credit: M. Roos

Implementation Steps:

A. PGCPS executives and administrators should promote school-based green infrastructure, identify partners, and support grant opportunities. (M3.StormWater.A)
B. Identify funding sources including CWP and external grant sources. (M3.StormWater.B)

M4 Transition Athletic Field Surfaces to Natural Turf

Prince George's County has steadily been replacing natural fields with synthetic turf over the past several decades. Although synthetic turf has high upfront costs, the industry that makes this product contends that these costs are paid for over its lifespan, as synthetic fields require no mowing and little maintenance and that athletic fields are used by multiple team sports, with little time between activities for natural grass to recover. One consequence of the switch to

artificial turf fields has been the loss of PGCPS groundskeeper positions, formerly at every middle and high school and now at virtually none.

A major concern of synthetic turf for the PGCPS system is the effect on students' health as well as climate change. Synthetic surfaces regularly reach temperatures above 150 degrees on summer days, where natural grass rarely reaches above 85 degrees on the same type of days. Heat waves related to climate change are the largest contributor to climate-related deaths in this area, and are expected to increase significantly. Synthetic turf materials and installations continue to evolve to address sports injuries and improve stormwater management with more sophisticated drainage, but these modifications do not address the rise in surface temperatures that is compounded by climate change. Artificial turf disposal, estimated at 300 million pounds in the previous decade for the U.S. alone, further compounds the environmental cost of its widespread use.

The tracking of reuse and disposal of worn out artificial turf is now the subject of Maryland General Assembly legislation due to the growth of this material in landfills.

Switching back to natural turf is supported by a UMD study conducted for College Park, MD, that evaluated different types of artificial turf vs. natural turf. The study noted that natural turf has the lowest environmental risk, provided that drainage can be maintained by controlling the intensity of use and scheduling periodic renovation. The City of Hyattsville has adopted an organic turf management system for their sports fields at David C. Driskell Park. Based on a soil biology assessment, the City is applying organic fertilizer to the fields and increasing aeration to four times a year to improve drainage. Conversion to natural turf will require PGCPS to provide staff training, increase drainage through regular maintenance, and modify activity scheduling to allow more time between games.

Implementation Steps:

A. Ensure community buy-in from the PGCPS athletic community on natural fields as a positive alternative to synthetic turf by:
    a. Hosting a regular football, soccer, or other appropriate sport at an existing natural turf field to increase awareness of the benefits of natural fields.
    b. Providing coaches and sports team booster club members with the latest evidence on the health effect of synthetic turf. (M4.StormWater.A)
B. Improve the quality of fields at schools that have not yet had their fields replaced with synthetic turf by:
    a. Creating a groundskeeper position at schools that have not yet had natural fields replaced; and
    b. Evaluating advances in natural field planting and developing a plan to use these techniques at existing natural fields. (M4.StormWater.B)
C. As synthetic turf fields reach the end of their useful life, return the fields to natural conditions and follow the recommendations in M4.StormWater.B. (M4.StormWater.C)

Resiliency Adaptation Measures

A1 Reduce Paved Surfaces and Replace Remaining Impervious Parking Areas with Pervious Paving

Permeable surfaces can reduce runoff volume by trapping and slowly releasing precipitation into the ground instead of allowing it to flow into storm drains. This same process also reduces the

peak rates of discharge by preventing large, fast pulses of precipitation through the stormwater system. Decreasing overall runoff volume through infiltration allows for downsizing of the rest of the stormwater infrastructure and may eliminate need for other components. Additionally, Prince George's County has ambitious stormwater goals and PGCPS can play a vital role in achieving county-wide success in reducing polluted runoff flowing into our water system.

Existing asphalt parking lots should be evaluated to determine if they are good candidates for replacement with porous asphalt. Flat or nearly flat areas and contributing drainage areas with low intensity runoff work best to maximize the runoff storage capacity. The drainage area should be paved or very well vegetated, not open soil, as this will contribute sediment and clog the system. If the parking lot is a self-contained drainage area with no other contributing runoff, it is possible to reduce the porous asphalt section to a portion of the lot, depending on the underlying soil infiltration capacity.

Implementation Steps:

A. Develop an assessment of parking lots to determine which areas can be removed and which are suited to replacement with porous paving, using the following factors at a minimum:
    a. Evaluate condition of existing lots, slopes, subsurface drainage conditions, condition of contributing drainage areas, and develop criteria-based score for replacement.
    b. Evaluate the number of parking spaces in regular use for possible elimination of unused spaces.
    c. Weighting of replacement schedule towards lots that are high priority for replacement.
    d. Weighting towards projects occurring in historically disadvantaged communities.
    e. Weighting towards projects that can provide learning opportunities for students or demonstration projects for the public at large. (A2.StormWater.A)
B. Develop an approach for replacing parking areas that includes at a minimum the following steps:
    a. Geotechnical evaluation of subsurface drainage conditions.
    b. Engineering evaluation of contributing drainage area, sizing and design of paving system.
    c. Engaging students by creating demonstration areas for testing infiltration.
    d. Develop a maintenance program for keeping surfaces clean of sediment. (A2.StormWater.B)

A2 Retrofit Buildings with Green Roofs Where Feasible

A green roof is a vegetative layer grown on a rooftop. It often consists of succulents in a shallow soil layer, but it can also be made up of grasses or flowering plants if the structure allows for deeper soil. Green roofs mitigate stormwater issues by collecting and absorbing rainwater and slowing runoff. Green roofs can also help decrease energy consumption for buildings by reducing heating loss in winter and cooling loss in summer. Green roofs have the added benefits of improving air quality, providing environmental education opportunities, and providing animal and insect habitat.

Implementation Steps:

A. Develop an assessment of which schools are most appropriate to be retrofit with green roofs using the following factors at a minimum:

a. The schedule of building replacement with a weighting towards buildings that are not expected to be replaced in the next 15 years.
b. The schedule of roof replacements, with a weighting of coupling green roofs with replacements,.
c. Weighting towards projects occurring in historically disadvantaged communities.
d. Weighting towards projects that can provide learning opportunities for students or demonstration projects for the public at large. (A2.StormWater.A)

B. Develop or augment an approach for retrofitting buildings with green roofs that includes at a minimum the following steps:
    a. Ensuring the structural integrity of the existing roof is analyzed and approved by a professional as a first step.
    b. Obtaining authorization for installation.
    c. Consultation with an engineer and landscape architect for planning and design assistance.
    d. Engaging students in research and design by building models and testing designs outside on tables or small structures.
    e. Developing strategies for continued care and maintenance, particularly during summer months when school is out. (A2.StormWater.B)
C. Prioritize native and pollinator friendly plantings on green roofs. (A3.StormWater.C)

A3 Preserve Existing Trees and Woodlands During Site Development Process

Much of the land owned by PGCPS for new school siting is undeveloped woodlands. These fragments of natural land cover, providing stormwater management, urban heat mitigation and wildlife habitat benefits, are essential to climate resilience. The ideal development process is to avoid developing vegetated sites and instead concentrate new school siting on already developed sites that are underused or vacant, such as abandoned shopping centers or outdated commercial properties. Alternately, new schools can be designed to preserve tree areas by minimizing building footprints, areas devoted to athletic fields and extents of parking. Sprawling development continues to undermine climate resilience county-wide, a trend that is not adequately mitigated by forest protection laws and smart growth incentives. PGCPS can exert leadership for resilient development and also address the equity challenges that arise when urban forests are removed.

Implementation Steps:

A. Maintain existing tree stock so that it remains healthy and adds value to the community. (A3.StormWater.A)
B. As part of the school location process examine already developed sites that are underused or vacant, such as abandoned shopping centers or outdated commercial properties. (A3.StormWater.B)
C. Right size parking and other built footprints to minimize the disturbance of existing trees. (A3.StormWater.C)
D. Develop a more robust set of options for swing spaces so that students can be temporarily moved during school rebuilds without displacing them too considerably. (A3.StormWater.D)

A4 Lead by Example to Support Transformational Land Use Change

Access to a healthy environment, with spaces for free and organized play, protected by wooded areas and shade, and free of trash and debris, is essential for the growth and development of our children. This is inarguably a right for our next generation and not a privilege that is

available only to those who can afford it. Many PGCPS schools, devoid of trees and natural soil, have not met even these basic environmental standards. Substandard site conditions are common to older, inner-Beltway schools. Many of these school sites have remained unchanged since their construction except for the installation of temporary buildings. Public schools are not given equitable consideration by County and State elected officials and planning and development agencies. Public schools are viewed as a cost burden, to be minimized by relegating them to undevelopable or lesser value sites. Woodland fragments or wetlands that would otherwise become parkland are instead utilized for schools, putting public education in conflict with environmental preservation.

We need to develop schools differently, elevating protection for our remaining natural spaces in the same way that the County prioritizes development. Our survey respondents placed "developing sustainably" at the top of their wish list for stormwater and land use priorities. It is clear that those deeply involved with public schools at the community level understand that a healthy environment contributes in a big way to a healthy learning environment. Siting new schools in a way that protects our natural lands - building on already developed sites, using smaller footprints, minimizing tree and soil removal, preserving slopes, wetlands and woodlands - will also protect the surrounding communities from negative impacts to public health. An approach to school development based on environmental stewardship benefits community well-being as well as reducing climate change impacts.

The Work Group does not intend for the recommendations to be applied to major projects currently sited and in planning, design and construction, however, the Capital Projects department is encouraged to incorporate recommendations where possible.

Implementation Steps:

A. Investigate developed properties that have outlived their current use for reuse as schools. (A4.StormWater.A)

Recommendation Number	Operational Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
O1 Stormwater & Land Use	Conduct a System-wide Landscape Inventory and Develop a Plan for Green Infrastructure & Sustainable Landscape Management	◉	◉	◉	◉	3-5
O2 Stormwater & Land Use	Establish a System-wide Project Database, with Tracking and Monitoring, for all Green Infrastructure and Conservation Landscapes	◉	◒	◒	◉	3-5

O3 Stormwater & Land Use	Incorporate Stormwater Management Activities into School Curriculum to Enhance Climate Science	◉	◉	◉	◉	3-5
O4 Stormwater & Land Use	Streamline the Review Process for Green Infrastructure Projects and Separate the Review Process from the Current Site Permitting Process	◒	◉	◒	◉	1-3

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Recommendation Number	Mitigation Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
M1 Stormwater & Land Use	Plant More Trees at Each School and Across the School System	◉	◉	◉	◉	1-5
M2 Stormwater & Land Use	Plant Native Plants and Create Conservation Landscapes for Stormwater and Multiple Benefits	◉	◉	◉	◉	1-5
M3 Stormwater & Land Use	Increase the Number of School-Based Green Infrastructure Projects	◒	◉	◉	◉	3+
M4 Stormwater & Land Use	Transition Sports Field Surfaces to Natural Turf	◉	◎	◒	◒	3-5

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Recommendation Number	Resiliency Recommendations	Within PGCPS Control	Existing Initiative Alignment	Operational Readiness	Cost Effectiveness	Timeline (Years)
A1 Stormwater & Land Use	Reduce Paved Surfaces and Replace Remaining Impervious Parking Areas with Pervious Paving	◉	◒	◒	◉	3+
A2 Stormwater & Land Use	Investigate Building Structures and Retrofit Green Roofs where Feasible	◉	◉	◉	◉	3+
A3 Stormwater & Land Use	Preserve Existing Trees and Woodlands During Site Development Process	◉	◒	◉	◉	1-15
A4 Lead by Example to Support Transformational Land Use Change	Reuse Already Developed Properties for School Sites	◒	◒	◉	◎	1-15

Chart Key: ◉ = Yes ◒ = Emerging ◎ = To Be Developed; Timeline from Year 2022

Equity Considerations

Green infrastructure programs administered by external organizations currently favor schools with more open space or greater capacity to administer programs or grant funding. A PGCPS-driven, system-wide approach will ensure that all schools and school districts are involved. Increased administrative support will allow schools with limited capacity to participate. An evaluation process that considers equity, such as the Treating & Teaching program does, places all schools on a more equitable footing to receive projects.

Labor Partner Considerations

Maintaining a natural health ecosystem and hydrology will require an increase in both numbers of staff and the training staff received. If an asset-based management framework is used, new staff will be needed to develop and maintain the asset database. Ground staff positions should be restored and training provided so staff is available for maintenance of rain gardens, native plantings, trees, green roofs, and natural turf fields. Some projects based in learning environments can be augmented with help from school green teams, but this cannot be the only source of maintenance since the summer months can be particularly important for green infrastructure maintenance. Management manuals specific to County ecology will be needed, and staff trained in order to properly care for the plantings. There also may be a need for training or hiring of staff to manage data collected to manage the green infrastructure and streamline the green infrastructure permitting process.

Current PGCPS Highlights: School Based Rain Gardens

DuVal High School Rain Garden

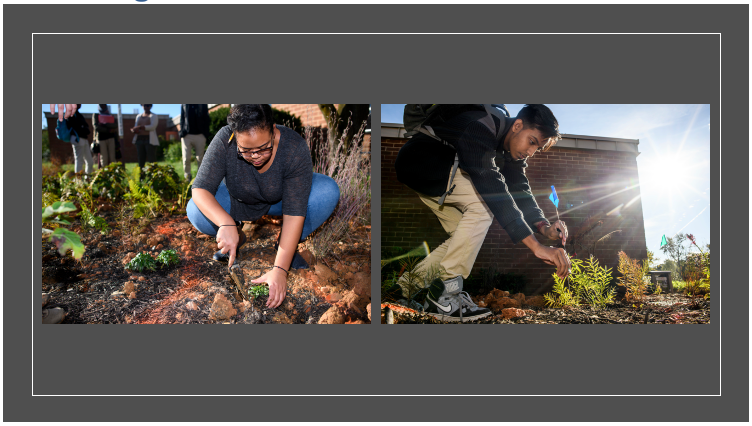


Photo credit: Matt Roth for NDC

In 2018, DuVal High School installed a rain garden on campus through a grant award provided by the Prince George's County Stormwater Stewardship Grant Program. Prior to the installation, DuVal students, teachers, and staff participated in workshops to learn about stormwater runoff, its impact on the health of local rivers and the Chesapeake Bay, and practices they could implement on campus to help improve the health of our waterways. Working with the Neighborhood Design Center, students, teachers, and volunteers planted over 200 native plants that were selected based on the light and soil conditions of the planting site, including black-eyed Susan, Maryland's state flower. In addition to reducing stormwater runoff on campus, the rain garden is also used by the school as an outdoor classroom, where students can investigate and study water flow, stormwater management, native plants, pollinators, and more. With the help of additional community partners including PGCPS William S. Schmidt Outdoor Education Center, Prince George's County Master Gardeners, and University of Maryland, DuVal staff and students learned how to maintain the rain garden and use it for educational purposes, including poetry and art.

Laurel Elementary School Rain Garden

Laurel Elementary School has participated in multiple green infrastructure programs aimed at creating a climate-ready future and involving students in hands-on environmental education and stewardship. As a participant in the Clean Watershed Partnership pilot program, Laurel ES received two rain gardens in 2016, treating runoff from approximately 0.8 acres. Students assisted the school Green Team to plant native wetland plants into the gardens. The school added an outdoor classroom in 2017, working with REAL School Gardens in partnership with the Chesapeake Bay Trust, Prince George's County Department of the Environment and PNC Bank. In April 2018, Laurel ES was the host site for the annual County Arbor Day Celebration, a partnership coordinated by the County Beautification Committee with the Maryland Department of Natural Resources, Prince George's County Department of Public Works and Transportation and the Department of the Environment. Educators and their students planted a tree for each of the thirty classrooms, further transforming the school grounds into a beautiful and sustainable landscape. *Photo Credit: M. Roos*

Implementation Team

Lead Agency

The Department of Building Services will be the lead agency in regards to this effort.

Supporting Partners

The Area Office on Interscholastic Athletics will play a role in communicating on the issue of natural versus synthetic turf and collaboration with groundskeepers on field maintenance needs.

The County Department of Public Works & Transportation (DPW&T) may play a role in evaluating impervious pavement replacement.

Curriculum and Instruction, the STEM office, and the William S. Schmidt Center for Environmental Outdoor Education will be responsible for integration of stormwater and other related education into the PGCPS elementary, middle, and high school curricula.

Chief Information & Technology Officer may need to assist in developing computer systems needed to track green infrastructure projects.

Measurement and Tracking

O1 Conduct a System-wide Landscape Inventory and Develop a Plan for Green Infrastructure & Sustainable Landscape Management Assets

1. Number of properties in the inventory and regularity of updates.
2. Number of acres of school grounds included in the inventory and management plan.

O2 Establish a System-wide Project Database, with Tracking and Monitoring, for all Green Infrastructure and Conservation Landscape Assets

1. Number of projects, with acreage, in the inventory and regularity of updates.
2. Number of individuals receiving training in database management, including volunteers.

O3 Incorporate Stormwater Management Activities into School Curriculum to Enhance Climate Science

1. Number of programs by grade level.
2. Feedback by students and educators on program success.

O4 Streamline the Review Process for Green Infrastructure Projects and Separate the Review Process from the Current Site Permitting Process

1. Length of time from request to permit issuance for green infrastructure projects.
2. Feedback from schools, design teams and permit reviewers on success of the process.

M1 Preserve Existing Trees and Plant More Trees at Each School and across the School System

1. Number of trees planted by size and species for each school on an annual basis.
2. Acreage of tree cover for each school.

M2 Plant Native Plants and Create Conservation Landscapes for Stormwater and Multiple Benefits

1. Number of native plants planted by type for each school.
2. Acreage of native plantings by school.
3. Number of individuals receiving planting and landscape management training, including staff and volunteers

M3 Increase the Number of School-Based Green Infrastructure Projects

1. Number and type of green infrastructure project by school.
2. Number of individuals receiving green infrastructure maintenance training.

M4 Transition Sports Field Surfaces to Natural Turf

1. Acreage of natural turf fields vs. synthetic fields.
2. Cost and maintenance data for different types of fields (installation, upkeep, mowing)
3. Feedback by sports coaches, players, and grounds staff.

A1 Reduce Paved Surfaces and Replace Remaining

1. Acreage of pervious and impervious parking surfaces.
2. Volume of runoff managed by pervious paving.

A2 Retrofit Buildings with Green Roofs where Feasible

1. Acreage of green roofs and number of schools with green roofs.
2. Volume of runoff managed by green roofs.

A3 Preserve Existing Trees and Woodlands During Site Development Process

1. Acreage of woodlands, stream corridor and wetlands preserved.
2. Number and size of existing trees preserved.

A4 Lead by Example to Support Transformational Land Use Change

1. Acreage of developed properties reused by PGCPS.

Helpful Resources

- Anacostia Watershed Society Treating & Teaching. AWS Treating & Teaching.
- Chesapeake Bay Landscape Professional training. CBLP training
- Chesapeake Conservation Landscaping Council. Conservation Landscaping Guidelines: The Eight Essential Elements of Conservation Landscaping. Resources-CCLC
- Clean Water Partnership, CWP Schools Program. CWP Schools Program
- Green Roofs for Healthy Cities. About Green Roofs.
- Hansen 2008, Hansen, K., Porous Asphalt Pavements for Stormwater Management. National Asphalt Pavement Association. Information Series 131, Lanham, MD. Porous Asphalt Guide for SWM
- Integrated Asset Management Framework: Combining Gray and Green Assets. Southwest Env Finance Center
- MAEOE - Maryland Association for Environmental and Outdoor Education, MAEOE Green Schools
- Penn State University, Center for Sports Surface Research. “Synthetic Turf Heat Evaluation - Progress Report.” 2012. Synthetic Turf Heat Evaluation 2012
- Prince George’s County Stormwater Management Design Manual, 2014 (being updated). Stormwater Design Manual, Prince George's County

- Tree Solutions Act of 2021 (Urban Tree Program) Tree Solutions Act 2021
- University of Maryland, College of Agriculture & Natural Resources. UMD Researchers Unlock the Potential of Trees for Managing Environmental Impacts in Cities. UMD, 2021. Potential of Trees for Managing Environmental Impacts.
- University of Maryland Environmental Science and Policy Capstone. Summary of Athletic Field Options: A Decision-Making Guide for Native-Grass, Modified and Engineered, and Synthetic Turf Fields. UMD, 2019. TerpTurf Final 2019
- University of Maryland, Landscape Architecture. Stormwater Management Lesson Plans for Grades 3-12. Stormwater Management Lesson Plans for Grades 3-12
- US Fish & Wildlife Service. Native Plants for Wildlife Habitat and COnservation Landscaping, Chesapeake Bay Watershed. NativePlantsforWildlifeHabitatandConservationLandscaping.pdf
- The Water Research Foundation. “Incorporating Forestry into Stormwater Management Programs (project 4837).” 2020. Incorporating Forestry into Environmental Programs

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- Prince George’s County Stormwater Management Design Manual, 2014. 8-8. https://www.princegeorgescountymd.gov/DocumentCenter/View/4627/Design-Manuals-PDF
- PGCPS, Prototypical Educational Specifications for Typical Elementary, Middle and High Schools. 2015 https://offices.pgcps.org/cip/index.aspx?id=257782
- PGCPS Climate Change Action Plan Focus Work Group meetings 10/06/2021& 12/01/2021. http://pgcps.org/climate
- UMD Stormwater Management Lesson Plans for Grades 3-12: Green Infrastructure as Outdoor Environmental Laboratories: Urban Water Quality Training in Primary and Secondary Schools https://cbtrust.org/wp-content/uploads/EPA-SW-Lesson-Plan-Book.pdf
- World Resources Forum 2020 https://www.wrforum.org/
- UMD Researchers Unlock the Potential of Trees for Managing Environmental Impacts in Cities https://agnr.umd.edu/news/umd-researchers-unlock-potential-trees-managing-environmental-impacts-cities
- Penn State University Synthetic Turf Research https://plantscience.psu.edu/research/centers/ssrc/research/synthetic-turf-surface-temperature
- The Intergovernmental Panel on Climate Change (IPCC) research https://www.ipcc.ch/ar6-syr/
- Synthetic Turf Council 2017, p 1. https://www.syntheticturfcouncil.org/
- UMD students charged with researching turf grass options for Duvall Field present findings https://dbknews.com/2019/12/04/umd-students-city-council-turf-grass-duvall-field-options-environmental-health/

Priority Recommendation #8: Lead by Example to Support Transformational Change

The school community must lead by example by taking immediate actions to curb greenhouse gas emissions and increase climate resilience in the school system. As climate change accelerates, climate-related natural disasters are becoming more frequent, deadly, and destructive, with growing human and financial costs.1 To protect our community's health and wellbeing, implementing the CCAP must become the top priority. Additionally, in leading, PGCPS can engage more fully students that will be experiencing the long-term impacts of climate change and provide them with the tools and knowledge to tackle the problem. The following recommendations touch on the transformational change necessary to implement a holistic plan and truly demonstrate climate leadership.

Priority Recommendation #8: Lead by Example to Support Transformational Change outlines 8 Operational Actions considered critical to supporting the goals of this recommendation. No direct Mitigation or Adaptation Actions are outlined under this recommendation.

Operational Recommendations

O1 Create a Sustainability & Resiliency Officer Position in the PGCPS Administration

Just as climate change will touch nearly every aspect of our lives, adapting to and mitigating the impacts of climate change will touch on numerous departments and staff of PGCPS. To best work across the numerous departments and ensure coordination between department heads and staff, this position should report to the CEO.

Also, grants, programs, laws and regulations, information, and technology in this field are changing so fast and it will be necessary to have a point person that is aware of the current state of affairs with regards to all of the different factors that can impact the climate plan. For instance, as we were writing this plan, a new federal school bus grant was announced, a new state grant program for energy benchmarking schools began, and several pieces of Maryland General Assembly legislation were being discussed that could have since been passed. Having a position that is responsible for being aware of these types of resources and can direct them to the proper department in PGCPS will benefit financial and environmental progress for the school system.

This position could be modeled after the Climate Change Officer in Montgomery County Government.

O2 Ensure that Equity Permeates through All Decisions Implementing the CCAP

It is vital that the Office of Equity & Excellence for PGCPS works to ensure that the equity considerations included in each section are accomplished. If the plan is implemented in a fashion that results in certain areas of the school system getting positive environmental treatments, and others not, this could lead to a negative perspective on this important work. Additionally, and more importantly, it could exacerbate negative health outcomes, access to resources, and other problems that historically disadvantaged communities in Prince George's County face.

O3 Ensure Equitable, Meaningful Student and Community Engagement.

Full implementation of the CCAP will require extensive changes that will impact the experience of students, teachers, and the community at large. A program of dedicated messaging, education, and outreach must be implemented to empower all community sectors. Students in particular need to contribute to the decisions being made.

> **"As a parent, a PGCPS employee, and an advocate, it is important that we take action towards developing a climate friendly present and future for the next generation. The actions that this work group is taking on climate change will lead the way for the next generation in PGCPS and Prince George's County.** – *David Smith, Sr., District Liaison at Prince George's County Board of Education, PGCPS Alumni and Work Group Administrator*

But this is also a two way street, especially in regards to the student body and staff. Students, staff, and the community at large will have to engage in programs to increase recycling, begin composting, stop idling, and be a part of numerous other behavioral changes that will lead to net-zero emissions system wide. Additionally, students, staff, and the community at large will need additional opportunities to provide feedback in order to find out where this plan and the actions taken are successful and need improvement. It is vital for students, staff, and the community at large to feel empowered to make the changes they need to and to play a role in the iterative improvements of the plan.

O4 Ensure that Negotiated Workforce Contracts Respond to the CCAP Recommendations

Unionized staff will play a vital role in the success of the CCAP and numerous recommendations will require adjustments to the requirements of daily work for PGCPS. Some of the changes will be challenging to undertake due to obligations in negotiated contracts with unions. During negotiations, PGCPS should maintain an open dialog with union representatives in order to ensure that updates to working requirements are necessary for successful implementation of the CCAP.

O5 Lobby for Necessary Changes to State, County & Federal Law and Regulations

In order for an orderly transition, there will be a need for some changes to State, County and Federal laws, as well as additional funding needs from the state of Maryland. The Sustainability & Resiliency Officer should be directed to advocate for changes to State, County and Federal laws that are recommended in the CCAP.

While PGCPS students are already advocating at all levels for climate action legislation and regulations, PGCPS will dedicate resources to provide students with direct experiences at the Board of Education, County Council, Maryland General Assembly, Congress and the White House levels that include dedicated lobby days and advocacy action events.

O6 Ensure that Capital Program and Other Budgetary Decisions Keep the CCAP Goals

Investments in infrastructure that rely on fossil-fuels to operate are becoming less economical to install and operate over a long-term horizon, to the point where further investment in new fossil-

fuel infrastructure will cost PGCPS more than the zero emission alternatives. In fact, it is already at the point where many new buildings are more economical to build without fossil fuels already. For instance, new school construction is analyzed on a thirty year horizon required by the IAC, but the goals for zero fossil fuel use in buildings occur with twelve years left on that horizon. If proper accounting is not undertaken this could lead to PGCPS stranding infrastructure investments prior to the end of the useful life. As a result, all long-term financial planning should at a minimum rely on an end of life date that meets the deadlines for PGCPS to meet clean energy goals if the infrastructure burns fossil fuels. It is also vital that climate resilience be baked into all long term capital decisions.

O7 Calculate a PGCPS Greenhouse Gas Inventory

Mitigation strategies in this document were focused on reducing fossil fuel usage based on the assumption that using fossil fuels directly contributes to greenhouse gas emissions. While a reasonable assumption, it does leave out some greenhouse gasses often used in coolant systems that are contributing to climate change but are often neglected under a fossil fuel focused approach. Also this approach did not consider if some activities produce more greenhouse gasses than others, and thus some priority actions could have gone unrecommended. At this current stage, so much progress is needed that this rougher approach is likely fine, but as PGCPS continues to reduce emissions it is recommended that an analysis of all greenhouse gas emissions produced by PGCPS be conducted so as to better determine priorities in future iterations of this work. In the future, all emissions should be examined regardless of if they emanate directly from burning fossil fuels.

O8 Update Inaugural Climate Change Action Plan

This Climate Change Action Plan is thorough, but by no means exhaustive. Not every stone was overturned and as discussed O7.Transformative the plan did not rely on a greenhouse gas inventory for decision making. Also new technologies, financing methods, and legislation may result in new opportunities that were not available at the time of writing, or were just not yet realistic to implement. In order to consider new information and engage a new generation of student leaders and staff the Climate Change Action Plan should be revisited and updated in 2027.

Summary & Next Steps

Mitigating greenhouse gas emissions and adapting to climate change that is already occurring will be a challenge for everyone, including PGCPS. However, through this work the Focus Work Group has determined both that progress is already being made at PGCPS and that many of the solutions that are needed can be implemented. There will be change needed though. Staff will need to learn new skills and take new approaches. Funding will have to be obtained and approaches to allocating resources over time will have to be altered. New skilled staff will be needed to perform new tasks or revitalize tasks that had been cut from operations and budgets.

> **"We need to do what we can to show the next generation we are taking action on climate change and are doing our part to help make that happen for my children and all of their peers. This work we have done together, when implemented, will lead to a healthier learning environment for PGCPS students and a better future for all Prince Georgians."** *– Joseph Jakuta, Work Group Co-Chair, Lead Volunteer, Climate Parents of Prince George's*

Though there will be challenges and change, the CCAP Focus Work Group did find that all stakeholder groups in the County are ready to help. Students are passionate about solving the problem and many will be active in doing so and learning about environmental issues. Many staff members are very knowledgeable about the issues facing PGCPS from climate change and are ready to use their skills to attack the problem. The community at large is also very interested in this work. The people of Prince George's County are ready to tackle the problem of climate change in our school system.

Next steps will begin immediately upon adoption of the CCAP by the PGCPS Board of Education. Stakeholders will be invited to serve on the CCAP Implementation Advisory Group Ad Hoc Committee of the Board of Education and on the Task Forces and work groups outlined in the plan. Agenda planning for the first annual Climate Ready Leadership Summit will begin by September 2022.

The Climate Change Action Plan Focus Work Group Members, Methodology & Timeline

Meet the Work Group Members

Pamela Boozer-Strother - Co-Chair
PGCPS Board of Education Member, District 3 and PGCPS Parent

Elected in November 2018, Pamela Boozer-Strother is the representative for Prince George's County Board of Education, District 3, and the parent of a PGCPS student. In her service on the Board of Education, Ms.Boozer-Strother has served as Vice-Chair and Chair of the Policy & Governance Committee, represented the Board of Education on the Legislative Committee of the Maryland Association of Boards of Education (MABE) and has served on the Operations, Budget, and Fiscal Affairs Committee. Ms. Boozer-Strother's interest in electric buses and Net-Zero Energy school construction for climate action (and the promise of reduction of long-term maintenance and energy expenses) propelled her interest in establishing this Work Group. Ms. Boozer-Strother earned her MBA from the Kogod School of Business at American University and B.A. from Alfred University, NY, and is a Certified Association Executive (CAE).

Joseph Jakuta - Co-Chair
Lead Volunteer, Climate Parents of Prince George's and PGCPS Parent

Joseph Jakuta is an environmental professional in the Washington, DC area. He has a Bachelor's of Science in Computer Science from the University of Maryland and a Master's in Environmental Management with a focus on Environmental Economics and Policy from the Nicholas School of the Environment. Following graduate school he worked at the Ozone Transport Commission (OTC) In 2018 he joined the District of Columbia Department of Energy and Environment as a Senior Air Quality Planner and was recently promoted to be a Branch Chief for the Air Quality Planning Branch. Mr. Jakuta is also active in the community. From 2015 to 2018 he chaired the Mount Rainier Green Team which assisted the City of Mount Rainier on developing local environmental policies and achieving Sustainable Maryland Certification for the city. In 2019 he became the lead volunteer of the Climate Parents Prince George's County campaign for 100% Clean Energy Schools. He is also on the Executive Committee for the Sierra Club Prince George's County Group.

Donald Belle
Environmental Programs Leader & Teacher Environmental Outreach Educator with the William S. Schmidt Outdoor Environmental Education Center, PGCPS

Donald Belle is an 18-year educator in the Prince George's County Public School (PGCPS) system. Mr. Belle is an Environmental Outreach Educator with the William Schmidt Outdoor and Environmental Education Center and has worked in the past as the science teacher coordinator and academy of environmental studies coordinator at Gwynn Park High School. He is an advocate for STEM education and has worked on numerous STEM initiatives. In 2012, Mr. Belle was awarded Outstanding Educator by Prince George's County Public Schools. Mr. Belle has recently contributed to, or coordinated, several environmental literacy initiatives including the Mussel Power Citizen Science Program, the Prince George's County Envirothon, and Climate Action Initiatives. For the past four years, he has organized and grown the Student Environmental Alliance Summit. The Student Environmental Alliance Summit supports high school students that have expressed an interest in working or learning about careers in

environmental science, natural resource management, or agriculture. In 2020, Mr. Belle was appointed to serve on the Prince George's County Climate Action Commission.

Nanette Amihere
PGCPS Class of 2021, Charles H. Flowers High School

Nanette Amihere is a graduate of the Charles H. Flowers High School 3D Scholars Program. She was heavily involved in several organizations including her school's Environmental Club, 2020-2021 Student Member of the Board Ninah Jackson's Advisory Council, National Honor Society, and the Leading Ladies and Lads Mentorship club in CHFHS. In her school's Environmental Club, she led group activities, and coordinated events, with the goal of increasing the awareness on recycling. She founded CNK Health Services, a nonprofit organization with the mission of giving back to the community. Through the organization she has initiated several service projects, and learned more about the issues facing her community.

Asia Gray
PGCPS Class of 2021, Charles H. Flowers High School, Columbia University Class of 2025.

Asia Gray is a graduate of the Charles H. Flowers High School in the Science and Technology Program. She was involved in several community organizations such as Girl Scouts, CHF Principal's Action Council, 2020-2021 Student Member of the Board Ninah Jackson's Advisory Council where she served as Director of Student Services Task Force for 2020-2021, and the District 4 Board Member Community Advisory Council. In the summer and fall of 2018 and 2019, she interned at the Smithsonian National Museum of Natural History through the Youth Engagement through Science Program. There, she performed research on cell phone infrastructure and sustainability practices in coordination with the Anthropology Department. She also participated in her school's internship program and served as an independent research intern at NASA Goddard Space Flight Center.

Nithin Gudderra
PGCPS Class of 2023, Oxon Hill High School

Nithin Gudderra is a Junior at Oxon Hill High School in the Science and Technology Program. In school, he is heavily involved in the AFJROTC Program as a member of the Kitty Hawk Air Society (HS), MD-011 Honor Guard, and serves as his wing's Inspector General Commander. Out of school, Nithin is an active member in his local 4-H Livestock Club (President 2018-21) and serves as a member of Maryland's 4H State Council on the public issues committee. Through his association with Gwynn Park High School he has been an active participant in the USDA AgDiscovery program, Jr. MANRRS for the past 7 years and National MANRRS (Minorities in Agriculture Natural Resources and Related Sciences) where he's participated in regional and national speaking competitions, exploring interests and gaining academic experiences in STEM and Agriculture. In addition, he has previously been selected to represent Maryland as a Delegate to the 2021 World Food Prize Global Youth Institute (GYI) where he participated with international experts discussing pressing food security and agricultural global issues and connecting with students around the world.

Breanna Malcolm
PGCPS Class of 2022, Eleanor Roosevelt High School

Breanna Malcolm is a senior at Eleanor Roosevelt High School who is heavily involved in several organizations such as the AFJROTC Program, Environmental Defense Club, 2021-2022

Student Member of the Board Alvaro Ceron-Ruiz's Advisory Council, the Japanese National Honor Society, and UNICEF club. In the AFJROTC program, she serves as her unit's Chief of Staff, the Deputy Commander of Color Guard, a member of the Kitty Hawk Air Society, and her unit's Sabre Team. In her school's environmental club she is the composting and recycling officer tasked with leading and coordinating activities to promote awareness on recycling and composting throughout her school. She started a composting initiative at her school with the help of CCAP Work Group members. Outside of school, she works as her sister's Technical Assistant for the Caribbean National Weekly (CNW), disseminating information pertaining to the Caribbean diaspora.

Ja'Bari Woodberry
PGCPS Class of 2023, Fairmont Heights High School

Jabari Woodberry was recommended to join the Climate Action Plan Focus Work Group in the summer of 2021, due to his interest in environmental studying and participation in events like Envirothon, Digital Footprint, and clubs. This has become one of his main focuses to be able to make the world a better environment. He wishes to inspire others to do the same and treat the world kindly. Being a support for the world was always one of his concerns and ideas. He is now working on cleaning up his neighborhood, and to be more aware of how he is living and what actions he is performing that affects our environment. He hopes to graduate high school, obtain a bachelor's degree, attend University of Maryland college, and finally study fine arts.

Sonya Williams
PGCPS Board of Education Vice-Chair and Member, District 9, PGCPS Parent and PGCPS Alumni

Sonya Williams was sworn in for her second elected term to represent Board of Education District 9 and was appointed as Vice-Chair of the Board of Education in January 2021. Mrs. Williams is a Civil Engineer with over 25 years of project management experience on local and national construction projects. As a developer who constructs buildings it is her intent to find ways to reduce the carbon footprint over the lifecycle of that building. Mrs. Williams, a Prince George's County resident since the age of 5, completed her secondary education at Crossland High School in 1985. After which she attended the University of Maryland to study Civil Engineering. Her career in Civil Engineering began as a project management intern at the Washington Suburban Sanitary Commission working on the headquarters building in Laurel. Mrs. Williams has worked on other local notable projects including the expansion of BWI-Marshall Airport and most recently the Tanger Outlet Mall. She received her master's degree in International Organizational Leadership from Georgetown University.

Mary A. Lehman
Maryland General Assembly Delegate, District 21, PGCPS Parent and PGCPS Alumni

Elected as a Delegate to the Maryland Assembly for District 21 in 2018, Ms. Lehman has served on many committees, including the Environment and Transportation Committee. Ms. Lehman was the District 1 representative to the Prince George's County Council from 2010 to 2018 where she served as a Member of the Health, Education and Human Services Committee, Vice-Chair, Transportation, Housing and the Environment Committee among other roles. As a councilmember, she oversaw the opening of the Prince George's Laurel Library Branch and lobbied for the library to have solar panels, pervious parking surfaces, electric car chargers, low flow toilets and sinks, and emergency lighting. Ms. Lehman is the parent of a current PGCPS

student and of graduates of the school system and has served in many roles as a PGCPS parent leader.

Deni Taveras
Council Member, Prince George's County Council District 2

Deni Taveras was re-elected to her second 4-year term on the Prince George's County Council in 2018. In 2020, she was elected as Vice-Chair, making history as the first Latinx person elected to a leadership role on the Council. As council member, she has put eight schools and two libraries in the pipeline for construction. Ms. Taveras has been lead sponsor and co-proposer of several key environmental legislation in the county including the establishment of the County Climate Action Commission. Council Member Taveras has been appointed to serve as the Chair of the Metropolitan Washington Council of Government's Climate, Energy and Environment Policy Committee (CEEPC) and is currently an appointed member of the Transportation Planning Board and a previous member of the Metropolitan Washington Air Quality Committee (MWAQC). Prior to coming to the council, she worked at the World Bank on solid waste management issues in urban areas in South Asia, in FEMA responding to catastrophic disasters such as Hurricane Katrina, and at the EPA regulating the Toxic Release Inventory program and assessing the cleanup at Superfund sites. Ms. Taveras holds a dual Masters degree in public affairs and urban regional planning from Princeton University's School of International and Public Affairs, a Master's degree from the University of Utah, and a Bachelor's degree from Barnard College; the latter two in chemistry.

Donald Goldberg
Executive Director and Founder, Climate Law & Policy Project (CLPP)

Donald Goldberg is the Executive Director and founder of Climate Law & Policy Project (CLPP), which he founded CLPP in 2007 after spending more than 18 years as a senior attorney and director of the Climate Change Program at the Center for International Environmental Law (CIEL). CLPP is a non-profit organization established in 2007 to develop and promote sound and safe policies to slow, stop, and ultimately reverse the buildup of greenhouse gases in the atmosphere and ensure that vulnerable communities are protected from climate impacts that cannot be avoided. Prior to his work at CLPP he participated in several UN Framework Convention on Climate Change negotiations and has spoken about climate change at many conferences, workshops, and academic meetings. Mr. Goldberg co-authored climate change reports for the US Environmental Protection Agency, the Intergovernmental Panel on Climate Change, and the World Bank. In 2005, in collaboration with Earthjustice, he filed a global-warming-based human rights case with the Inter-American Commission on Human Rights on behalf of the Inuit. Mr. Goldberg has taught international environmental law at the American University Washington College of Law and served as chair and vice chair of the ABA Committee on Sustainable Development, Ecosystems, and Climate Change from 1998-2006.

Ramón Palencia-Calvo
Deputy Executive Director, Maryland League of Conservation Voters, Chispa Maryland Director

Soon after Ramón Palencia-Calvo joined the organization in 2014, he launched Chispa Maryland, a Latino outreach and organizing program created to ensure that Maryland Latino families and community leaders are a powerful voice in protecting their rights to clean air and water, healthy neighborhoods, and a safe climate for generations to come. During his time at Maryland LCV, Ramon has developed and implemented issue organizing campaigns that led to local and statewide victories and developed new Latino leaders in Maryland that can take

grassroots and legislative action in a number of environmental justice issues. Mr. Palencia-Calvo has more than 15 years of experience in leadership and advocacy on environmental and social issues. Before joining Maryland LCV, Ramon was a Fellow at the Worldwatch Institute, where he worked on an international project identifying social, political and economic opportunities to accelerate the deployment of renewable energy in Central America.

Michael Harris
Senior Capital Projects Manager, Bowie State University

Over the course of several decades Michael Harris has been involved in the programming, planning, design, construction, and project management of building and infrastructure projects totaling in excess of $2 billion. Michael has experience in leadership roles for facilities operations and maintenance at Bowie State University where he currently serves as the Senior Capital Projects Manager, and previously at Howard University where he held the position of Associate Vice President for Facilities Management and Capital Planning. Michael is currently leading development of a new mixed-use residence hall which is under construction and slated for LEED Silver or Gold. In addition, he is overseeing numerous major HVAC improvements with centralized BAS controls. Michael led the implementation of seven Solar PV installations, including two parking lot solar canopies, with a capacity in excess of 2 MW making it one of the largest on- campus solar PV installations in the University System of Maryland. Mr. Harris previously worked with a large national construction company providing superintendence for two large Class A office buildings in Washington DC, and, earlier in his career worked in structural design for various types of facilities. Mr. Harris received his Bachelor of Science in Engineering from Princeton University.

Chloë Waterman
Program Manager, Friends of the Earth's Climate-Friendly Food Purchasing Program

Chloë Waterman currently serves as the program manager for Friends of the Earth's Climate-Friendly Food Purchasing Program where she implements policy and markets campaigns to advance a sustainable and just food system. Her work centers around reducing consumption of factory farmed animal products and growing the market for plant-based foods and regenerative, organic, and more humanely raised meat and dairy. Ms. Waterman previously served as the senior manager of state legislative strategy for the American Society for the Prevention of Cruelty to Animals (ASPCA) where she successfully lobbied for a wide range of animal protection legislation and was instrumental in defeating pro-factory farming measures. Ms. Waterman holds a B.A. in Environmental Studies and Philosophy from Lewis & Clark College, and an M.S. in Applied Economics from University of Maryland.

Marita Roos, RLA
Principal, UrbanBiology LLC

Marita Roos is a Maryland-registered landscape architect and certified planner with twenty-five years' experience designing urban streetscapes, green infrastructure, campus master plans and designs, parks, ecosystem restoration and historic preservation projects. As the Landscape Programs Director with NDC's Prince George's County office, Ms. Roos worked with local governments, nonprofit organizations, schools and citizen associations to plan and design projects that integrate community goals into sustainable and equitable public spaces. Ms. Roos has contributed expertise in green infrastructure and sustainable design to national policy initiatives including Rebuilding America: APA National Infrastructure Investment Task Force Report and the U.S. Green Building Council LEED 2009 Sustainable Sites. She authored the

Green Infrastructure Guidelines for the Edwards Aquifer Region of south-central Texas and worked with the DC Clean Rivers Program to plan for green stormwater infrastructure across the Rock Creek and Potomac River watersheds. As a landscape architect, Ms. Roos has designed numerous environmental landscapes for schools, parks and public spaces within Prince George's County and across the mid-Atlantic region. Ms. Roos has lectured in environmental design at the University of Maryland and Catholic University of America, among others.

Dawn Holton, PE
A/E Design Supervisor/Senior Mechanical Engineer, Department of Capital Programs, PGCPS and PGCPS Alumni

Dawn Holton grew up in Landover, MD, and attended PGCPS schools, graduating from Eleanor Roosevelt High School in 2000. She went on to attend North Carolina Agricultural and Technical State University and graduated in 2004 with a Bachelor of Science in Architectural Engineering (HVAC Systems concentration). In 2012, she also passed the mechanical engineering principles and practices exam earning her Professional Engineer (PE) designation and became fully licensed in the State of Maryland. Prior to working at PGCPS, she spent 12+ years; designing heating,ventilation, air conditioning and plumbing systems for commercial buildings at various private engineering firms. Many of the types of projects she worked on included designs for office tenant fit-outs, medical offices, hotels, residential high-rise buildings, gymnasiums, fitness centers, restaurants, retail spaces, numerous data centers, and public school construction projects in Maryland/DC region including Prince George's County, Baltimore City, Montgomery County, Anne Arundel County, Fairfax County and Howard County. Of all of the different types of projects that she worked on in her career, she feels most connected with school projects because of the ability to interact more with the end users - students, teachers and staff. The greatest joy in her current position at PGCPS is that she has the opportunity to have a direct impact on repairing the buildings she grew up attending.

Jamee Alston
Management Analyst, Division of Supporting Services, Department of Building Services, PGCPS

Jamee Alson has almost twelve years of service with PGCPS, including 6 years as Management Analyst with the Division of Supporting Services, Department of Building Services. She has been fully engaged in energy management/sustainability efforts by monitoring all utilities, serving as a liaison with our utility partners, touring NetZero schools, implementing the EmPower Maryland Program, managing three rooftop solar projects from start to finish, retrofitting schools, facilities, bus lots, garages, and gyms with LED lighting, partnering with our PGCPS Mechanical Engineer, Facilities Service Base Master Foremen/Maintenance Team, and Capital Programs Project Managers/Design Team to select Energy Star rated energy efficient equipment. Ms Alson has advocated for energy efficient tools/resources/practices that assist with promoting energy and water savings; expose students to energy related careers; co-implement the National Energy Education Development' Energizing Student Potential energy education program with PGCPS educators and students; conduct energy audits with K-12 students at STEM programs at the University of Maryland, Drexel University, and The Illinois Institute of Technology; facilitate energy sessions at Prince George's County's SYEP (Summer Youth Employment Program). Finally. Ms. Alson was afforded the opportunity to become CPTED (Crime Prevention Through Environmental Design) certified by the National Association of School Resource Officers in Peachtree, Georgia.

David Hill
Transportation Operations Supervisor, Transportation Department, PGCPS

David Hill oversees scheduling, routing, payroll, communications and overall operations within the department. He has over 20 years of school transportation and logistical planning experience and also has over 40 years of Transportation Operational and Maintenance experience in various key leadership positions. Mr. Hill has served as a Transportation Director, Supervisor of Planning and Technology, Routing Manager, Maintenance Manager and various other vital positions producing outstanding results. Additionally Mr. Hill has received numerous awards for outstanding leadership and professionalism, is an active member of the National Association for Pupil Transportation and the Maryland Association for Pupil Transportation, and is also actively involved with The Prince Georges County Pedestrian and Bicycle Safety Committee. Finally, Mr. Hill is retired from the United States Marine Corps, where he served for 22 years as a 1st Sgt and a Transportation Operations Manager and has a Bachelor Degree and a Master's Degree in Transportation Management.

Martin Diggs
President, ACE/AFSCME, LOCAL 2250, AFL-CIO

Martin Diggs is a Bus Driver with over 19 years of experience with the Prince George's County School System. He is also an entrepreneur, having owned a Limo Service, Classy Limousine co. for the past 2 years.
Mr. Diggs. serves on the Executive Board of Local 2250 for the school year 2018-2020. During this time, he saw opportunities for improving the outreach to members by increasing communication, transparency, visibility, and accountability. Mr. Diggs is an active member of the Transportation Chapter. However, he recognizes, Local 2250 will only achieve more significant accomplishments when all of its chapters have the representation they need. His vision for Local 2250 is to have knowledgeable and active members who participate in all parts of the union. Mr. Diggs is also an Army veteran who served honorably from 1987-1995 as a combat soldier.

Additionally, Kevin Kennedy of ACE/AFSCME, LOCAL 2250, AFL-CIO attended several meetings as a proxy for Mr. Diggs.

Alveta Addison
Co-chair of the Environmental Justice Committee, Alpha Kappa Alpha

Ms. Alveta Addison has organized Earth Month for university students, oversaw student research on police violence against African Americans, and developed other community-based programs while an advisor for HU Mission for Better Living for Everyone. Additionally, Ms. Addison worked for the Doug Williams Foundation to provide educational outreach programs for communities in underserved neighborhoods in Washington, DC. She also served on the Board of Rise, Inc., which provided various services for the same community. Ms. Addison helped develop and manage programs for grants sponsored by institutions such as National Science Foundation, NASA, and SECME. As part of these programs, she organized and coordinated middle and high school science, engineering,and mathematics programs in addition to teacher training programs. Ms. Addison is a graduate of Howard University: B.A. English and M.A. Education. She currently serves as an administrator in the Office of Student Affairs in the Graduate School at Howard. She is a member of Tau Beta Sigma Honorary Band Sorority, Alpha Kappa Alpha Sorority, Inc. and the Howard University Alumni Association. As an Alpha Kappa Alpha Sorority member, she is co-chair of the Environmental Justice Committee.

Michelle Smith
Assistant Principal, Largo High School & Academic Resource Teacher, Academy of Health Sciences @ PGCC, PGCPS Alumni

Michele Smith is a product of Prince George's County Public Schools, and has spent her entire 22-year career in the same school system. She started her career as a middle grades English/Language Arts and Social Studies classroom teacher. Later she served as a central office instructional specialist; mentor teacher, instructional literacy coach; and an area office resource teacher. Ms. Smith was also an adjunct professor for Trinity Washington University School of Education for 6 years. She earned her National Board Certified Teacher distinction in December of 2017. Ms. Smith is the assistant principal for the Largo High School Class of 2K23. She served as an assistant principal at Largo High School for 5 years. During her tenure, she supervised the Science, Social Studies, and World Languages departments. Her greatest professional achievement to date is serving as the assistant principal for the Largo High School Class of 2019. Ms. Smith is a proud alumna of Oxon Hill High School's Science and Technology program, The Ohio State University (undergraduate and graduate school); and Bowie State University. She has one child, who was diagnosed on the Autism spectrum; making her extremely passionate that ALL children can learn when someone meets them where they are, and keeps motivating them to be "better than they were, the day before."

Board of Education Support Staff

Valerie Ervin
Special Assistant to the Chief of Staff, Prince George's County Public Schools

David W. Smith Sr.
District Liaison at Prince George's County Board of Education

Expert Advisors

Introductions, Intentions, Overview, Planning, PGCPS Structure

- Dr. Alvin Thornton, Former Chair of the PGCPS Board of Education & Chair of the Thornton Commission on Education Finance, Equity and Excellence
- Kate Culzoni, CCAP Volunteer Facilitator, PGCPS Parent

State & County Legislation and Funding and County Climate Action Commission - May 19, 2021

- Delegate Mary E. Lehman, District 21
- Dawn Hawkins-Nixon, P.E., Associate Director, Sustainability Division, Prince George's County Department of Environment
- Mary Abe, , RLA, LEED AP, Section Head | Natural Resource Protection & Stewardship, Sustainability Division, Prince George's County Department of the Environment

Town Hall Student Moderators - May 20, 2021 & February , 2022

- Asia Gray, Charles Herbert Flowers High School (Work Group Member)
- Nithin Gudderra, Oxon Hill High School (Work Group Member)
- Breanna Malcolm, Eleanor Roosevelt High School (Work Group Member)
- Ja'bari Woodberry, Fairmont Heights High School (Work Group Member)
- Javier Fuentes, Laurel High School

- Jessica Watts, Friendly High School
- Sydnee Assan, Charles Herbert Flowers High school
- Esther Binigbolo, Charles Herbert Flowers High School
- Laylah-Toné Castro, Academy of Health Sciences @ PGCC
- Chari Molley, Academy of Health Sciences @ PGCC
- Hopeabigail Mbanga, Academy of Health Sciences @ PGCC
- Hailey Bowen, Academy of Health Sciences @ PGCC
- Cheryl Fagbemi, Academy of Health Sciences @ PGCC
- Hope Tiwang, Academy of Health Sciences @ PGCC
- Maya Miller, Eleanor Roosevelt High School
- Jehan Idsassi, Eleanor Roosevelt High School
- Chad Bo, Eleanor Roosevelt High School
- Jennifer Tepetate, Eleanor Roosevelt High School
- Maha Idsassi, Eleanor Roosevelt High School
- Jalal-Abdul Yahaya, Eleanor Roosevelt High School

Environmental Justice and Equity - June 23, 2021

- Senator Clarence Lam, Maryland General Assembly, District 12
- Abel Olivo, Executive Director, Defensores de la Cuenca
- Staci Hartwell , co-chair Environmental and Climate Justice Committee, Maryland NAACP
- Jan-Michael Archer, Doctoral Candidate, University of Maryland, Community Engagement, Environmental Justice, and Health (CEEJH)
- Emily Frias, Maryland Grassroots Coordinator, Chesapeake Climate Action Network (CCAN)

STEM/General Education - July 21, 2021

- Dr. Kia McDaniel, Director, Curriculum and Instruction, PGCPS
- Desann Manzano-Lee, Instructional Specialist, PGCPS

CTE Program - September 15, 2021

- Dr. Judith White, Chief Academic Officer, PGCPS
- Dr. Jean-Paul Cadet, Director, Career Technical Education, PGCPS

Labor - September 15, 2021

- Doris Reed, Executive Director, ASASP
- William Sellman, President, SEIU Local 400
- Elizabeth Bunn, National Policy and Maryland State Director, Labor Network for Sustainability
- Dr. Judith White, Chief Academic Officer, PGCPS

Food Production - October 6, 2021

- Joan Shorter, Director, Food and Nutrition Service (FNS), PGCPS

Waste Cycles - October 6, 2021 & January 19, 2021

- Sara Gillespie, Maintenance Technician for Recycling, PGCPS
- Diana E. Conway, President, Safe Healthy Playing Fields Inc.
- Dr. Kathleen Michaels, Advocate, Safe Healthy Playing Fields Inc.
- Joe Richardson, Lunch Out of Landfills

Buildings - October 15, 2021 & November 3, 2021

- Dr. Shawn Matlock, Director, Capital Programs, PGCPS
- Antoine Taylor, Operations Supervisor, Building Services, PGCPS
- Sam Stefanelli, Director, Building Services, PGCPS
- Reilly Loveland, Senior Project Manager, New Buildings Institute

Transportation - November 17, 2021 & January 19, 2021

- Dr. Rudolph Saunders, Director, Transportation, PGCPS
- Dr. Mark Fossett, Chief Operating Officer, PGCPS
- Dr. Charoscar Coleman, Associate Superintendent-Supporting Services, PGCPS
- Mark Dreszer, Supervisor, Central Garage Services, PGCPS
- Christine Gerbode, Former Senior Research Analyst, ACEEE
- Dr. Avi Mersky, Transportation Program Senior Researcher, ACEE
- Michael Mancinelli, Electric Design Manager, Highland Electric Fleets
- Gerry Chessman, Highland Electric Fleets

Stormwater and Land Use - December 1, 2021

- Sam Stefanelli, Director of Building Services, PGCPS
- Karen Bowlding, Maintenance Training Specialist, Building Services - Electric Shop, PGCPS
- James Roberson, Instructional Specialist - Environmental Literacy, William S. Schmidt Outdoor Environmental Education Center, PGCPS
- Eric Jones, Program Manager, Corvias (Clean Water Partnership)
- Ariel Trahan, Director of River Restoration Programs, Anacostia Watershed Society
- Sadie Drescher, Vice President of Programs for Restoration, Chesapeake Bay Trust
- Valerie Woodall, Grounds Committee, Mount Rainier Elementary School PTO

Regional Collaboration - February 23, 2022

- Antoine Thompson, Executive Director, Greater Washington Region Clean Cities Coalition

Guiding Principles

#1 We believe in broad Work Group member buy in:
- Therefore, we will make consensus-driven decisions that drive CCAP elements.
- Therefore, we will rely on a multi-facilitator approach to running meetings with each member taking on the lead at a point.
- Therefore, meetings will end with a discussion and decision point by consensus on the course of action from the prior meeting.

#2 We believe in science:
- Therefore, we will create data-driven solutions that drive positive impact.
- Therefore, we will strive to develop a plan to meet the science-based goals in the originating resolution.

#3 We believe in transparency, equity, and inclusivity:
- Therefore, we will employ a comprehensive stakeholder engagement approach to gather input and communicate information throughout the process.
- Therefore, we will find solutions that can be implemented fairly for all stakeholders.

#4 We believe in accountability:
- Therefore, we will reevaluate principles after four meetings.
- Therefore, we will strive to participate fully in meetings and provide necessary feedback in a timely fashion.

- Therefore we will incorporate an adaptive management approach to our recommendations in order to incorporate lessons learned, emerging technology, and best practices

Work Group Meetings

Work Group meetings were held by relevant topic area and featured expert panels to discuss the current state of affairs, challenges being faced, and actions for the future. The first meeting was intended as an introduction opportunity for the Focus Work Group members to each other and the process. The next four meetings covered overarching topics that affected all aspects of the Climate Change Action Plan. These meetings covered State and County legislation, equity and environmental justice issues, education and outreach, and career technical education and labor issues. Seven meetings were held to cover each of the technical topic areas, with experts from outside the PGCPS community and relevant staff from PGCPS.

Data Request

In order to better understand the current state of PGCPS in regards to the seven issues areas a data request was made in June 2021. PGCPS provided vital data for the buildings, electricity, and transportation sub-work groups to analyze. Some data could not be obtained. The CCAP plan sections on recommended tracking metrics do include recommendations on data that should be collected so that PGCPS staff, and the public at large, can better understand areas for improvement and how progress is being made.

Sub-work Groups

Following the fact finding meetings held by the Climate Change Action Plan Focus Work Group, eight Sub-work groups were established. Six of these sub-workroups were set up to address one of the technical topic areas outlined in the implementing document (Climate-Friendly Food and Food Waste was combined with Other Waste Streams) and two were set up to approach the topics of legislation and equity. At their meetings, they reviewed the results of the stakeholder engagement, the discussions from the relevant Focus Work Group meetings, data obtained through the data request, and other relevant information. Using the information from this review they relied on a matrix valuation in order to estimate the impact and ease of implementation of multiple recommendations. These recommendations are the basis of the priority recommendations and actions in the CCAP.

Stakeholder Engagement

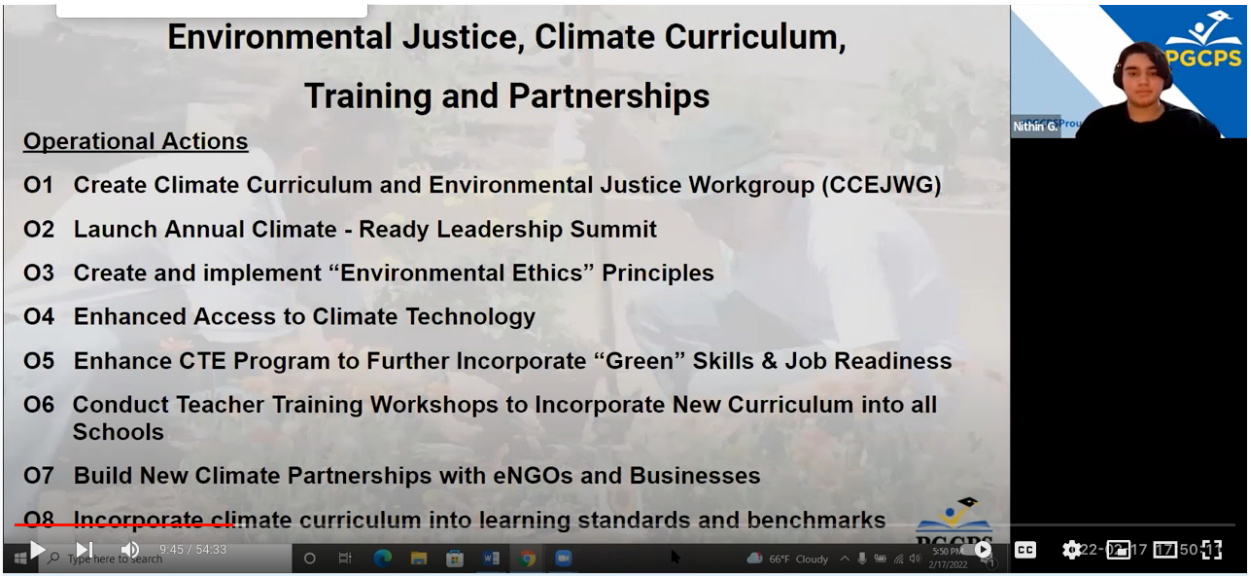
Multiple opportunities for stakeholder engagement occurred from April 2021-February 2022 so as to ensure community buy-in on the development of the CCAP. Ideas were fleshed out democratically and served to increase awareness about the CCAP and climate change in general. The stakeholder engagement opportunities were geared towards the students more so since they would be the ones most affected by these recommendations and are the generation that will be more affected by climate change. A student-led virtual Student Town Hall was held on May 20, 2021, and was attended by 90 people, which allowed students to discuss and engage on the issues. Some results of the event follows:

- Identification of student climate action leaders who served as moderators of breakout sessions.
- Ranking of climate action priorities.
- Ranking of individual actions to engage in at school, in the community and policy advocacy.
- Ranking of how current PGCPS curriculum and Career & Technical Education (CTE) opportunities are preparing students for future careers and citizen engagement.
- Additional Data Analysis and Results from Student Town Hall https://go.boarddocs.com/mabe/pgcps/Board.nsf/files/C55PM26527E5/$file/PGCPS%20Student%20Climate%20Change%20Town%20Hall%20Analysis%20and%20Data.pdf
- Recording of May 20, 2021, Student Town Hall, https://youtu.be/0XkSJrj3tjY

An online survey of open-ended questions was posted from October 1st-November 12, 2021. There were 155 respondents representing students, teachers, staff, parents, environmental advocates and concerned citizens. The feedback from the survey was integrated into the recommendations and the results are available online: https://drive.google.com/file/d/1I2P7KzypCBfCoD-I5pu3gpNLU2n_2JUJ/view

A second student-led Town Hall was held on February, 17, 2022, to reveal the draft priority recommendations and receive input from students, staff and parents on their level of enthusiasm for the plan and how they see themselves engaged in action and implementation.

- Recording on February 17, 2022 Town Hall, https://www.youtube.com/watch?v=EI7dBk9jQcU



Agendas & Meetings Schedule

Date	Topic
January 14, 2021	First Reader of Implementing Resolution at Board of Education
March 1, 2021	Unanimous Adoption of Implementing Resolution by Board of Education
April 21, 2021`	Introduction, Intentions, and PGCPS Structure with Special Guest Dr. Alvin Thornton
May 19, 2021	Overarching Topic: State County Legislation/Funding
May 20, 2021	Student Town Hall (Student Focus Groups)
June 23, 2021	Overarching Topic: Environmental Justice
July 21, 2021	Overarching Topic: Education and Awareness
July 28, 2021	July Board Meeting - Mid Term Update and Approval of Members and Timeline changes
August 18, 2021	No Meeting - Summer Break
September 15, 2021	Overarching Topic: Labor Present and Future
October 6, 2021	Special Topic: Materials and Waste Cycles Special Topic: Food/Food Waste
October 12, 2021	Online Stakeholder Survey Distribution Began
October 20, 2021	Special Topic: Building Construction, Maintenance, and Operations

November 3, 2021	Special Topic: Electricity Procurement and Continuation of Building Discussion
November 17, 2021	Special Topic: Transportation
December 1, 2021	Special Topic: Stormwater and Land Management
Throughout December	Sub-work group Meetings
December 15, 2021	Wrap-Up: Report Out of Sub-work groups
January 19, 2022	Wrap-Up: Review of Initial Draft
January 19, 2022	Presentation to the Board of Education Operations, Budget and Fiscal Affairs Committee
January 24, 2022	Presentation to the Board of Education Academic Achievement Committee
January 25, 2022	Presentation to the Board of Education Policy and Governance Committee
February 17, 2022	Second Student Town Hall to Reveal Draft Recommendations
February 23, 2022	Wrap-Up: Review Draft Final Editing
March 17, 2022	Work Group Vote to Recommend Final Plan to the Board of Education
March 24, 2022	1st Reader on Board of Education Agenda
April 28, 2022	Adoption by the PGCPS Board of Education (unanimous vote): • Dr. Juanita Miller, Chair • Sonya Williams, Vice Chair, District 9 • Alvaro Ceron-Ruiz, Student Member of the Board • David Murray, District 1 • Joshua M. Thomas, District 2 • Pamela Boozer-Strother, District 3 • Shayla Adams-Stafford, District 4 • Dr. Zipporah Miller, District 5 • Vacant, District 6 • Kenneth F. Harris II, District 7 • Madeline LaSalle Frazier, District 8 • Judy Mickens-Murray, Appointed • Curtis Valentine, M.P.P., Appointed

The Prince George's County Board of Education Climate Change Action Plan Focus Work Group meeting recordings, agendas and supporting documents are archived on the PGCPS website, pgcps.org/climate.