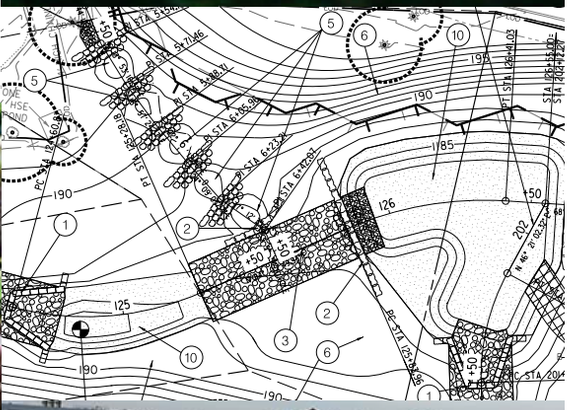
# CLIMATE ACTION IMPLEMENTATION STRATEGY PLAN

MARCH 27, 2024

PLAN AS RECOMMENDED BY

**PRINCE GEORGE'S COUNTY CLIMATE ACTION IMPLEMENTATION TASK FORCE**





Aisha N. Braveboy
*County Executive*

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# EXECUTIVE SUMMARY

The Prince George's County Climate Action Plan (CAP) outlined 26 Priority Recommendations that serve as the foundation of the Prince George's County Climate Action Implementation Strategy Plan. From its inception, the Prince George's County Climate Action Plan (CAP) was not intended to serve as an all-inclusive climate action prescriptive document. In answer to the need for greater clarity and urgency to begin implementation of the CAP, County Executive Angela Alsobrooks authorized the creation of the Climate Action Implementation Task Force (Task Force) via Executive Order NO. 5 – 2022. The primary charge of the Task Force under E.O. NO. 5 – 2022 was to technically review and interpret the CAP to create a living document that is practical, actionable, and relatable to the terms, metrics, and outcomes of our County government.

Initiated in the fall of 2022, the Task Force and its working groups met on an ongoing basis to discuss, consider, and evolve the recommendations of the CAP towards the eventual creation of the Prince George's County Climate Action Implementation Strategy Plan (CAISP). The Task Force focused its efforts to identify concise implementation strategy actions within our County government's sphere of control, budget constraints, and staff capacity. Intended as a companion document to the CAP, the CAISP is a "roadmap" for Prince George's County government to begin the transformational and critical transition to a carbon-neutral and resilient future.

To ensure transparency and trackability against the CAP's overarching mitigation and adaptation goals, the Task Force recommends 17 Climate Action Implementation Strategies (Implementation Strategies) which are categorized by climate action areas intrinsic to the CAP: Leadership (County Operations), Mitigation, and Adaption. The Task Force has approved 12 Implementation Strategies. The remaining five (5) strategies will be prepared for inclusion in the next plan update.

Table A–1. Leadership Implementation Strategies (LIS)

| ID | Climate Action Area | Implementation Strategy Title | Status |
|---|---|---|---|
| LIS-1 | Internal Capacity | Build internal capacity to plan and implement climate action | Recommended by Task Force |
| LIS-2 | Climate Criteria | Integrate climate resilience criteria into long-range County plans, policies, and CIP projects and ensure there is a sustainable source of funding to implement these climate implementation strategies | Recommended by Task Force |
| LIS-3 | Community Engagement | Transparency, equitable engagement, and climate information | Recommended by Task Force |

Table A–2. Mitigation Implementation Strategies (MIS)

| ID | Climate Action Area | Implementation Strategy Title | Status |
|---|---|---|---|
| MIS-1 | Renewables | Equitably transition to a resilient and renewable energy system | Under Development Leads: DoE, OCS |
| MIS-4 | Electric Vehicles | Equitably transition to zero emissions vehicles | Recommended by Task Force |
| MIS-6 | Telework | Adopt internal policies to enhance resilience and reduce VMTs of County employees | Recommended by Task Force |
| MIS-8 | Energy Efficiency | Accelerate implementation of deep energy retrofits and community-wide efficiency and weatherization efforts | Recommended by Task Force |
| MIS-9 | Benchmarking | Establish and adopt benchmarking energy and conservation standards | Recommended by Task Force |
| MIS-10 | Waste | Expand County waste reduction and diversion efforts | Recommended by Task Force |
| MIS-11 | Trees | Maintain a climate-resilient equitable forest and tree canopy cover | Under Development Leads: DoE, DPW&T, M-NCPPC |

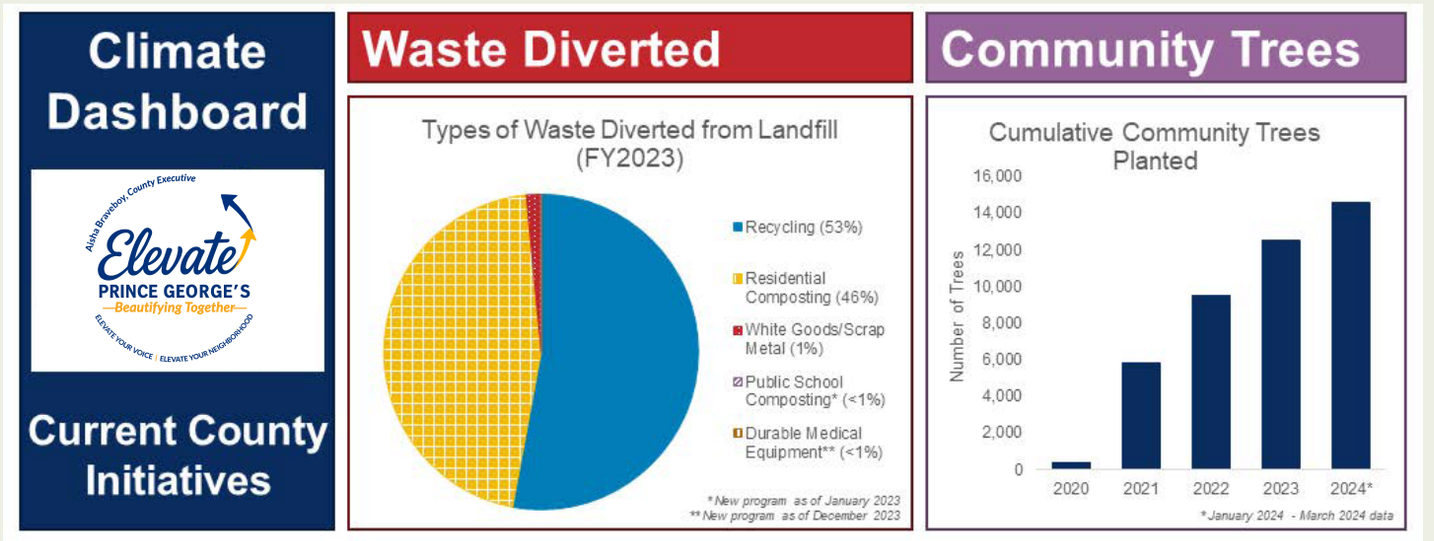
Table A–3. Adaptation Implementation Strategies (AIS)

| ID | Climate Action Area | Implementation Strategy Title | Status |
|---|---|---|---|
| AIS-2 | Stormwater Standards | Build the management of climate change risk into all County codes, standards, practices, and guides to better manage stormwater and reduce flooding | Under development Leads: DoE, DPW&T |
| AIS-3 | Land Use | Establish climate-resilient land use regulations to steer development to high growth areas, minimize impacts to natural resource areas, and reduce the County's exposure to flood risks | Under development Leads: M-NCPPC, Economic Development |
| AIS-4 | Dams Levees | Evaluate and address climate risk to dams and levees | Recommended by Task Force |
| AIS-7 | Extreme Heat | Reduce exposure of vulnerable populations to extreme heat | Recommended by Task Force |
| AIS-8 | Resilience Hubs | Establish resilience hubs to serve the needs of vulnerable communities | Recommended by Task Force |
| AIS-9 | Codes and Standards | Adopt codes, standards, and practices to support a climate-ready Prince George's County | Under development Leads: DPIE |
| AIS-10 | Food | Promote a climate resilient food system supported by low-carbon, climate-smart agriculture and sustainable farming practices | Recommended by Task Force |

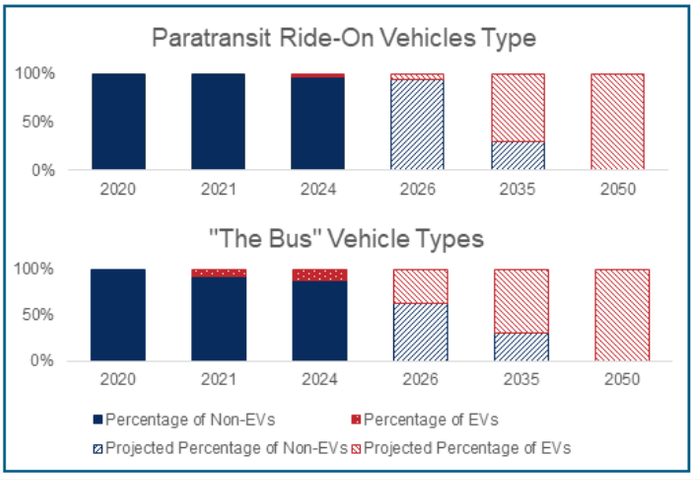
*Complete list of acronyms on page 121.*

Leadership Implementation Strategies focus on actionable transformational changes within county government to embed climate actions as part of our daily mission, budgets, and programmatic efforts. Adaption Implementation Strategies are primarily focused on evolving existing programmatic operations and policies of agencies to prioritize building climate resilience through championing nature-based solutions and green infrastructure for carbon sequestration and to prepare for increasingly frequent extreme weather events, urban heat island impacts, and flooding issues. Implementation Strategies under Mitigation are primarily focused on transitioning away from fossil fuel use, retrofitting for energy efficiency, and ensuring equitable access to renewable energy. In parallel to the overarching goals of the CAP, CAISP's Implementation Strategies share the commonality of championing equitable investment in our County's economically disadvantaged communities and addressing long-standing environmental justice.

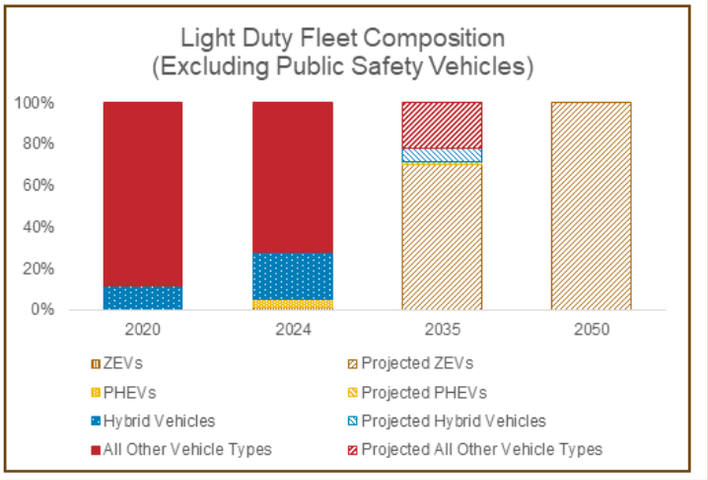
Core to the Task Force's vision to urgently begin climate action implementation, all County agencies and related entities must make a deliberate and conscious effort to allocate resources and make financial decisions that prioritize and promote carbon reductions in tandem with building community-wide climate resilience. As County government, our vision is to create a place where every resident thrives and prospers. To realize this vision today and into the future, we must steadfastly commit to integrating climate actions and resiliency planning across all facets of government to ensure our residents and businesses thrive in the face of escalating impacts from climate change. The initial 17 Implementation Strategies of the CAISP represent an actionable beginning towards ensuring our residents and businesses will be economically thriving, equitable, resilient, and prepared to meet the challenges to come. As a living document, the CAISP must continue to evolve and accelerate embedding climate actions as integral to every agency's daily mission and how we do business as a local government.



# Local Government Fleet




# Transit Fleet




# Climate Dashboard

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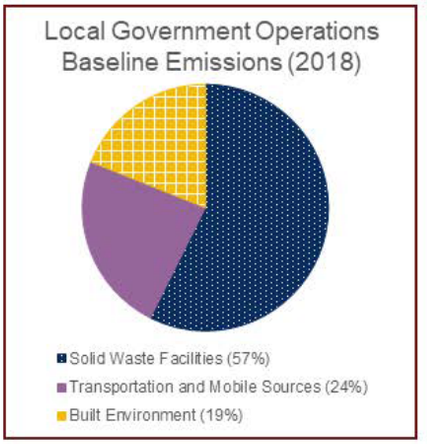
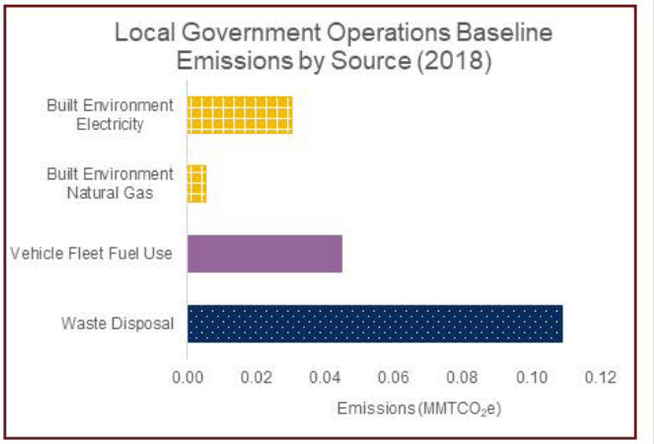
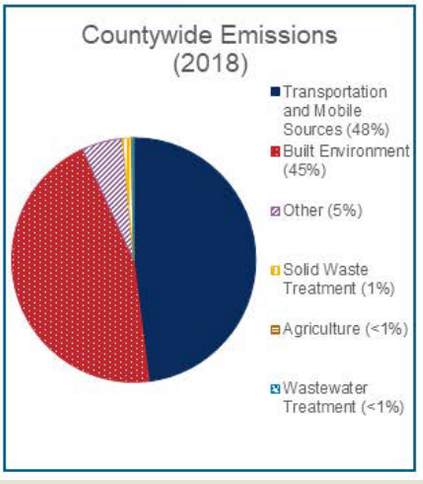
## Past County Progress

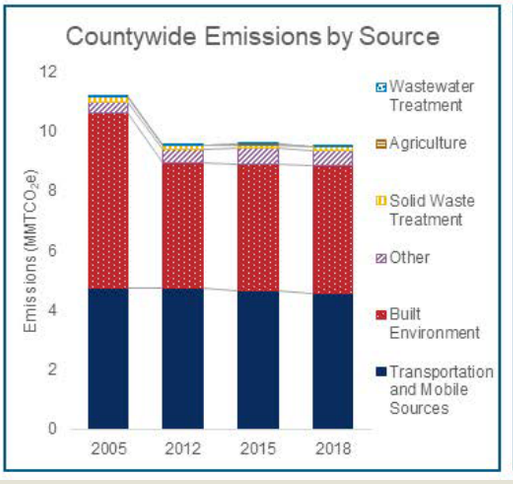
# Local Government Emissions

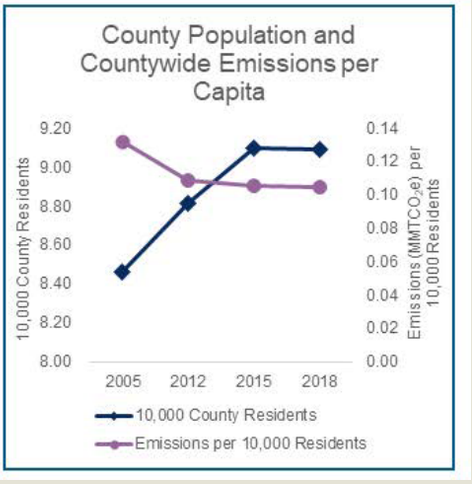



# Countywide Emissions



Across County Government there has been a great deal of success and progress in the past 6 years on Climate Action - here are a just a few examples:

- **Powering County Operations with Renewable Energy:** OCS, in partnership with DoE Sustainable Energy, is installing five (5) solar canopy systems on parking lots at 5 government sites. The systems will generate enough electricity to power over 400 homes, and all the energy generated must be provided to the County free of charge for 15 years. Completion by end of 2023
- **Residential Climate Resilience:** DoE's Sustainability Division has initiated a pilot project (Community SWM Blitz) through the Stormwater Stewardship Grant Program to build community-wide climate resilience and to address local flooding through focused outreach, community engagement, and installation of small to medium scale green infrastructure practices. The practices that will be installed include those supported by the County's Rain Check Rebate Program such as cisterns, rain gardens, conservation landscaping, and pavement removal. Alliance for the Chesapeake is leading this project in the Tantallon area of Ft. Washington.
- **Green Jobs:** With the support of the Prince George's County Economic Development Corporation, Blink Charging Co., a leading global electric vehicle charging equipment provider, opened its global headquarters at a 15,000-square-foot facility in Bowie, MD in 2024 and is constructing a new LEED Gold-certified 30,000-square-foot production facility also in Bowie. Blink's decision to expand its operations in Prince George's County reflected the County's status as a leader in green, sustainable manufacturing and has made a significant commitment to the deployment of electric vehicle charging.
- **EV Charging:** the County has completed installation of ~ 140 public-purpose EVCS on government properties (including municipals) throughout the county at locations such as park and recreational facilities, libraries, government office buildings, and Park and Rides.
- **Zero-emissions Buses:** DPWT has deployed 12 fully-electric buses, and has funding for 26 additional zero emissions buses and the infrastructure to support them.
- **Reducing VMT for County Employees:** Since the COVID emergency sent staff home in March 2020, the County has made significant strides in creating a digital environment that supports minimizing VMT (and minimizing waste- another significant source of GHG), while delivering improved services. The County has been awarded first place in the national "Digital Counties Survey" in its population category (500,000 to 999,000) in 2021, 2022 and 2023, demonstrating our continued commitment to improving services through technology.
- **Energy Efficiency Grants for Homeowners:** As of February 2024, Sustainable Energy has processed over 2,000 energy efficiency grant applications. The grant, coupled with EmPOWER Maryland energy incentives, assists residents with implementing energy-efficiency measures in nine designated neighborhoods, classified as Energy Resiliency Communities (ERCs).
- **Commercial Property Assessed Clean Energy (C-PACE) Program:** FSC First has awarded three loans as of February 2024 designed to assist commercial property owners with financing up to 20% of the appraised value to make qualifying energy efficiency and clean energy improvements.
- **Food Waste in Public Schools**: DoE and PGCPS have partnered, bringing food scrap composting to 26 schools to reduce food waste and to promote food scrap composting- student compost at lunch using the same tools they have at home, so they can be composting "ambassadors" for their families. Also, with the help of a grant for development of education and outreach materials, DoE will train teachers and administrators who will later train others as the program grows.

# CLIMATE ACTION IMPLEMENTATION TASK FORCE

### VOTING MEMBERS

**Director of the Department of the Environment (DoE) (Chair),** Andrea Crooms
**Director of the Office of Central Services (OCS) (Vice-Chair),** Jonathan Butler
**Director of the Department of Permitting, Inspections and Enforcement (DPIE),** Dawit Abraham
**Director of the Department of Public Works and Transportation (DPW&T),** Michael Johnson
**Director of the Office of Homeland Security (OHS),** Ronald E. Gill, Jr.
**Executive Director of the Housing Authority of Prince George's County (HAPGC),** Jessica G. Anderson-Preston
**Director of the Redevelopment Authority (RDA),** Jacqueline West-Spencer
**Deputy Chief Administrative Officer (DCAO) for Economic Development,** Angie Rodgers, (Jim Chandler - Delegate)
**Health Officer/Director of the Prince George's County Health Department,** Dr. Matthew Levy
**Director of the Prince George's County Planning Department, Maryland-National Capital Park and Planning Commission (M-NCPPC),** Lakisha Hull
**Director of the Prince George's County Department of Parks & Recreation, M-NCPPC,** Bill Tyler
**Prince George's County Council,** Alex Hirtle, Policy Analyst and Special Projects Coordinator
**Climate Resident Advisory Group (CRA Group),** Current Chair: Laila Riazi, City of Greenbelt; Previous Chair: Asma Siddiqui, Town of University Park; Interim Chair: Joe Thompson, City of College Park
**President and CEO of the Prince George's County Economic Development Corporation (PGC EDC),** David Iannucci
**Chairman of the Prince George's County Planning Board, M-NCPPC,** Peter Shapiro
**Superintendent of the Prince George's County Public Schools (PGCPS),** Millard House II, (Jamee Alston - Delegate)
**Vice President of the Prince George's County Municipal Association (PGCMA),** Melinda Mendoza, Council Member for Town of Colmar Manor
**President and CEO of FSC First, Business Finance Programs,** Dawn R. Medley

### NON-VOTING REPRESENTATIVES

**Director of Prince George's Soil Conservation District (SCD),** Steven Darcey
**Director of the Prince George's County Office of Management and Budget (OMB),** Stanley Early
**Director of Government Accountability,** Ryan Middleton

# ACKNOWLEDGMENT

The Climate Resident Advisory (CRA) Group has been an invaluable participant in the development of Prince George's County's Climate Action Plan Implementation Strategies. The CRA is a diverse group of volunteers from across the County that have dedicated their free time to this process. From their initial convening in late 2022, the full CRA has met over 18 times at 90-minute all-hands meetings. Starting in July 2023, The CRA members also attended at least one of three 90-minute work group meetings that mirrored the county's Task Force work groups. Each CRA work group met eight (8) times between July and December 2023. Beyond this effort, each CRA work group had at least one liaison who attended the 8 daytime county staff Task Force work group meetings that also took place between July and December 2023.

In addition to attending meetings, the CRA reviewed and provided written input on documents; offered thoughtful feedback on the overall Prince George's County Climate Action Plan implementation process; and pushed the County to move forward on climate action. We would like to acknowledge the substantial time and effort the CRA has put into this process and thank them for working to advance the interests and concerns of Prince George's County residents.

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# I. IMPLEMENTATION VISION:

## EMBEDDING CLIMATE ACTION AS PART OF OUR DAILY MISSION TO SERVE OUR RESIDENTS

The CAP outlines goals and actions to reduce GHG emissions by 50% below 2005 levels by 2030, achieve carbon neutrality by 2050, and prepare our County's residents and businesses to adapt and thrive in the face of climate change threats. With a keen awareness of budget and staff capacity limitations, the Task Force first identified which mitigation and adaptation strategies were feasible and actionable to scale up implementation actions in FY 2025. Prioritizing funding for existing programmatic efforts closely aligned or even implementing climate actions was deemed the most efficient approach given that, with fewer startup costs, existing agency programs could be quickly scaled up to intentionally pursue a relatable climate action goal.

With a sense of urgency that our County's weather and storm events will increasingly become more extreme, frequent, and difficult to predict, the Task Force acknowledged that moving forward, our County must commit to a proactive approach by embedding climate resilient standards (still to be determined) when initiating new infrastructure projects. This implementation vision should also consider requiring climate resilience upgrades when maintaining or repairing significant infrastructure assets. Intrinsic to climate action, the Task Force agreed that County-funded projects and programs should prioritize funding and resources for projects supporting climate resilience for our County's populations and communities most vulnerable to climate change. Harnessing the free power of nature by championing nature-based solutions to overcome the weather extremes anticipated from climate change was also identified as a central component to embrace for future adaptation and climate resilience projects.

However, adaptation was only part of the Task Force's vision. As a general point of consensus, Task Force members agreed that urgent action to curb our County's fossil fuel use and immediately begin the transition to clean renewable energy towards a carbon-neutral future was critical. Additionally, equitable access to clean energy, resilience hubs, and incentives to ensure affordable energy efficiency upgrades are within reach for all our residents was a fundamental goal for the CRA Group, which provided County residents with a strong voice in the Task Force. All Task Force members agreed that transitioning to renewable energy is also a generational business opportunity. Transitioning to a carbon-neutral world helps ensure our future residents inherit a cleaner environment and a path to prosperity.

At a very practicable level, the Task Force's implementation vision begins with the understanding that each County agency and entity must now make a deliberate and conscious effort to allocate resources and make financial decisions that prioritize and promote carbon reductions and adaptation measures as part of their existing

operations. Moreover, budgeting for climate action will require an institutional shift to help operationally prioritize pursuing alternative funding sources, such as grants, low-cost loans, fees, etc., to help bridge growing budget shortfalls. When viewing the breadth of the Task Foce's recommended implementation strategies, most, if not all, of the County government operations will be impacted as we transition to embedding climate actions as part of the daily operations of all County-managed agencies and entities.

Example of some recommended questions agencies and county entities may ask during budget season to proactively embrace embedding climate actions as part of their fiscal budget:

Climate change mitigation refers to efforts to reduce or prevent greenhouse gas emissions. Mitigation strategies include transitioning to renewable energy sources, improving energy efficiency, such as LED lighting and efficient HVAC systems, promoting sustainable transportation, encouraging remote work arrangements, and adopting electric or hybrid vehicles within the fleet. They also include protecting and restoring forests, outreach and education, and other natural carbon sinks.

**What initiatives has your agency implemented to mitigate climate change?**

Climate resiliency involves preparing for and adapting to the impacts of climate change to minimize vulnerabilities and ensure business continuity. Resiliency efforts encompass designing and constructing climate-resilient infrastructure, developing early warning systems, implementing sustainable and resilient stormwater water management practices, and creating emergency response plans if infrastructure fails. Budgetary considerations for resilience involve investing in resilient infrastructure design, conducting risk assessments, implementing disaster preparedness initiatives, affordable housing, and providing resources for community engagement and capacity building.

**What initiatives has your agency implemented to address climate resiliency?**

A carbon diet requires changing behavior and mindset, like adopting healthier eating habits. It encourages employees, stakeholders, and partners to be conscious of their carbon impact and make sustainable choices in their operations.

**What behavioral changes has your agency implemented to address your carbon footprint?**

**Are there opportunities to combine resources and efforts to achieve synergies between mitigation and climate resilience initiatives of your agency or to partner with other agencies?**

**Do you have an existing program that could be quickly altered to respond to the challenge of climate change?**

Actions with co-benefits and synergies can be classified as high impact with low cost. For example, promoting energy efficiency operations, recycling/reuse, rainwater harvesting as part of building retrofits, proactive redesign of CIP projects in the early stages to account for new precipitation standards, embracing water conservation through operational changes of landscape maintenance crews, prohibiting large vehicle or equipment idling by installing an Idle Smart or similar, education, outreach, and training your staff on how their duties may become critical responding to climate change and mitigation strategies.

**What high-impact, low-cost mitigation and/or climate resiliency actions will your agency seek funding to implement in the fiscal budget?**

The primary source of GHG emissions and our County's climate vulnerabilities are complex and evolving processes. Below are charts from the CAP to help explain the source of GHG emissions and why the effort to begin implementation towards our CAP's goals is achievable but an evolving and very complex endeavor.

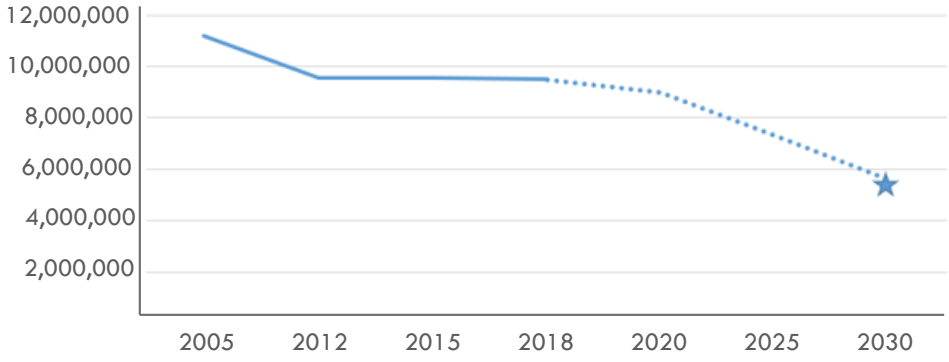



Figure I–1. County GHG Emissions Trends

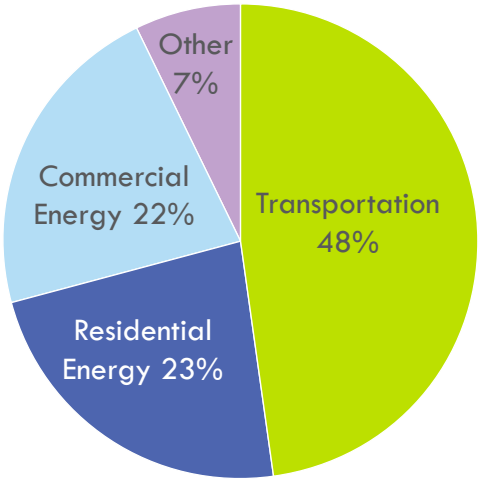



Figure I–2. Year 2018 County GHG Emissions by Sector

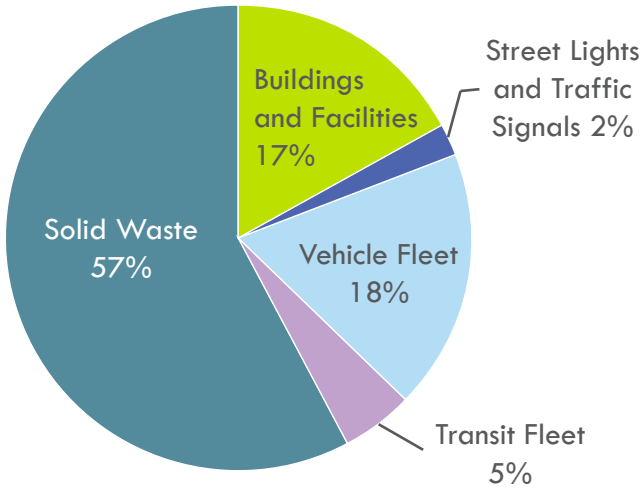



Figure I–3. Emissions from County Operations

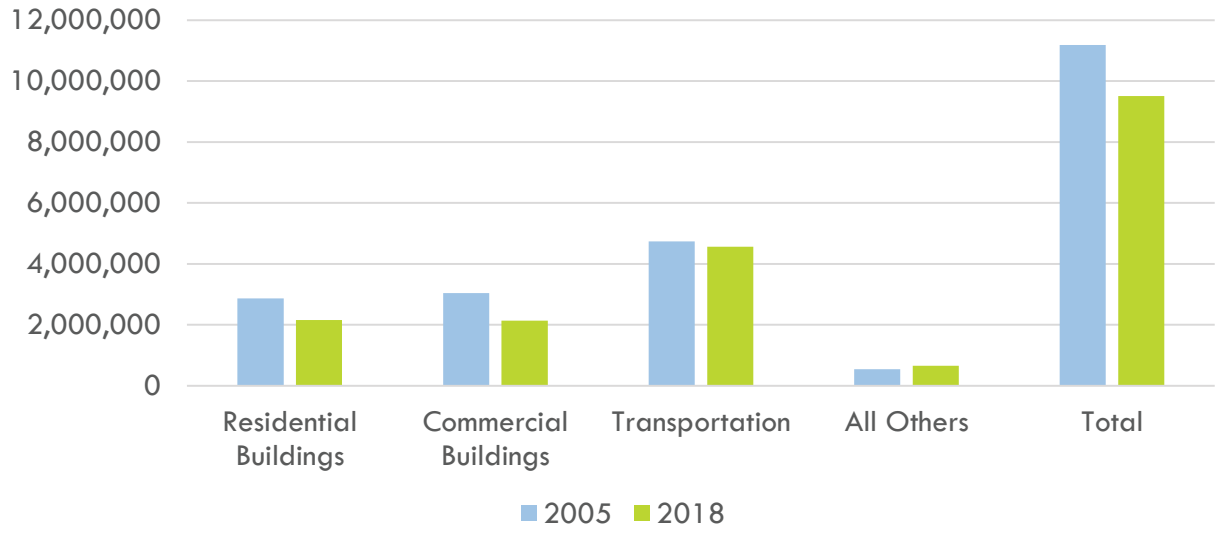



Figure I–4. Prince George's County GHG Emissions 2005-2018

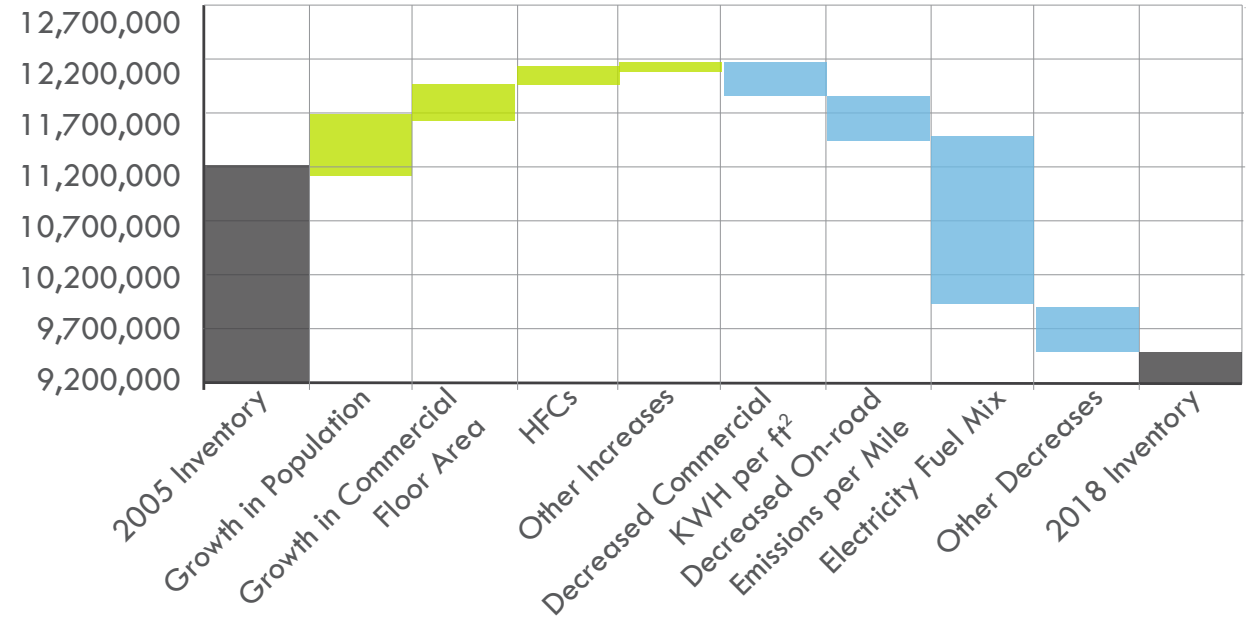
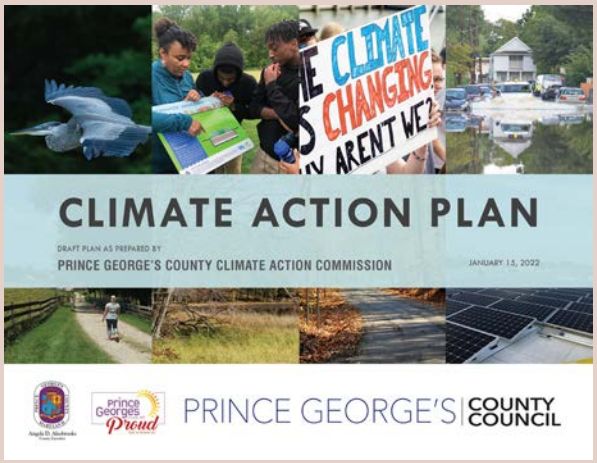



Figure I–5. Drivers of GHG Change in Prince George's County

Though the preceding charts and graphs tell part of the story of our estimated County GHG emissions and climate vulnerabilities when the CAP was drafted in 2021, that data, for better or worse, does not tell our County's emission and climate vulnerabilities story now. An important observation by the Task Force's expert climate action consultant teams is that Prince George's County, like many of our other local jurisdictions, needs a complete and up-to-date asset management system for ongoing assessment of both risks and opportunities of County-wide assets. Additionally, benchmarking data for our buildings and operations must be updated on a set cycle if we are to measure success or failure. Without specific data sets or an up-to-date condition assessment of all County assets accessible in one central depository, developing more detailed implementation strategies was not feasible. As part of the CAISP, investing in a real-time system for up-to-date asset management and energy benchmarking will be critical to achieving the CAP's goals. For reference, the CAP's GHG Inventory and Climate Vulnerability Study can be found in the Appendix section of this document.

# II. UNDERSTANDING CLIMATE IMPLEMENTATION STRATEGIES

## OVERVIEW




The Prince George's County Climate Action Plan (CAP), developed in 2020 by the Climate Action Commission (CAC) and adopted by the County Council in 2022, outlined 26 Priority Recommendations across three categories (County Operations, Mitigation, and Adaptation) with over 144 potential Implementation Steps to help steer and highlight urgent action to transition the County toward a resilient, carbon-neutral future in the face of ongoing and escalating climate change.

From its inception, the draft CAP was not intended to serve as an all-inclusive, prescriptive document but rather an iterative set of recommendations that would help inform the County's priorities and adapt to the County's needs over time. In addition, because the CAP was drafted by the CAC, a diverse group of stakeholders, it was not developed with the level of specificity required for actionable implementation by a County government. As such, the CAP lacked procedural detail and County-based implementation language. In answer to the need for greater clarity to inform more concise agency level climate action directives, County Executive Angela Alsobrooks authorized the creation of the Climate Action Implementation Task Force via Executive Order NO. 5 – 2022.

The primary charge of the Task Force under E.O. NO. 5 – 2022 was to perform a technical review and interpret the CAP to inform a practical Climate Action Implementation Strategy Plan, evolving and streamlining the CAP's 26 Priority Recommendations into actionable, practicable, and transparent climate action implementation strategies that our County government agencies and entities can follow, track, and implement. The Task Force helped inform the Climate Action Implementation Strategy Plan as a companion document to the CAP that serves as a more streamlined "roadmap," using relatable terms, metrics, and clear outcomes for County agencies and related entities.

To develop the Climate Action Implementation Strategy Plan, the Priority Recommendations were divided into three topical groups and assigned to the following Task Force work groups:

**County Operations & Engagement Work Group**

Priority Recommendations: CO-1, CO-2, CO-3, M-1, M-4, M-6, M-10, A-1, A-6

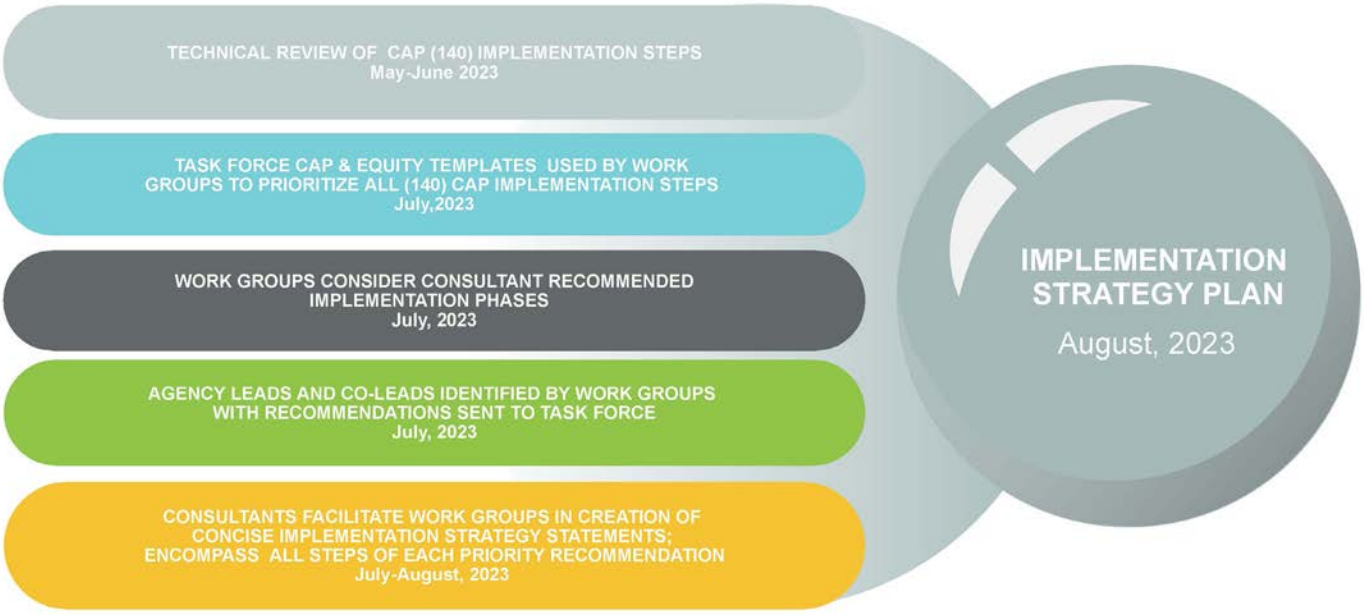
**Energy & Infrastructure Work Group**

Priority Recommendations: CO-4, M-2, M-3, M-8, M-9, A-4, A-7, A-8, A-9

**Land Use, Development, & Transportation Work Group**

Priority Recommendations: CO-5, M-5, M-7, M-11, A-2, A-3, A-5, A-10

These work groups met virtually for 90 minutes approximately every two weeks between July and December 2023. They first completed a technical review of each Priority Recommendation to identify obvious duplication, contradictions, and/or technical issues and anything needing further discussion.




In some cases, as detailed below, Priority Recommendations were combined and/or steps within them were regrouped in more logical arrangements for efficient implementation by the County. Next, the work groups developed an Implementation Strategy summary statement that captured, in a few sentences, the overall intent of each Priority Recommendation(s) but in the lens of implementation. Finally, they laid out each Implementation Strategy in more detail, using a combination of existing language from the Priority Recommendation where appropriate and new language that fits with how the County operates. The Resident Advisory Group for Climate Action and Environmental Justice (CRA), which serves as an active member of the Task Force, formed work groups and followed the same process in their own evening meetings (also meeting 90 minutes every two weeks for each work group) to provide feedback and suggestions to the Task Force. The CRA also had at least one representative participate in each Task Force work group where they also relayed the CRA work group suggestions and feedback.

DoE and its consultant teams have consolidated and summarized feedback from this past year's Task Force work group meetings and reviews. Special attention was also given to feedback from the CRA.

The following chart shows how the Task Force work groups evolved the CAP's 26 Priority Recommendation into 17 Climate Action Implementation Strategies. It is important to note that, in consideration of work group feedback, County budget availability, and the overall complexity of transitioning the CAP's 26 Priority Recommendations into practicable government actions, the Implementation Strategies of the CAP will be rolled out in phases with some implementation Strategies still under development.

# III. CLIMATE ACTION IMPLEMENTATION STRATEGIES



## Climate Action Implementation Strategy Key

CAISP Climate Action Areas:

As a supporting document to the CAP, the CAISP is categorized into three (3) Implementation Strategy Climate Action Areas: Leadership (County Operations), Mitigation, and Adaption. The following are the abbreviations for each Climate Action Area:

| | |
|---|---|
| LIS | Leadership |
| MIS | Mitigation |
| AIS | Adaptation |

The number associated with each Implementation Strategy is for identification only. For example:

**LIS-1**

LIS = Leadership Implementation Strategy

1 = Unique identification within the CAISP Climate Action Area

As possible, the numbers within each Climate Action Category corresponded to the related CAP Priority Recommendation. However, because the Task Force work groups combined some Priority Recommendations, numbering does not always correspond to the identification used within the CAP. If a category skips numbers, for example, in the Mitigation Section MIS-1 is followed by MIS-4, this is not an error.

The CAP recommended 26 Priority Recommendations. Through the work of the Task Force, the CAP's 26 Priority Recommendations have been consolidated down to 17 Implementation Strategies.

## Implementation Strategy Template Key

At a minimum, each Implementation Strategy will provide clarity on specific Implementation Strategy topics as outlined per the Implementation Strategy Template Key:

| | |
|---|---|
| **IMPLEMENTATION STRATEGY SUMMARY STATEMENT** | Using relatable government terminology and references, the Summary Statement is a concise summary of the actions that the lead agency(s) and/or supporting agency(s) must take to implement the strategy. |
| **WHY IT MATTERS** | This section describes why and how a specific Implementation Strategy may be critical and necessary to achieve the overarching goals of the CAP or a goal of the Task Force. |
| **MAGNITUDE OF BENEFIT** | Each Implementation Strategy offers multiple benefits that lead to positive outcomes in the County beyond achieving a specific Implementation Strategy GHG emission reduction or adaption goals. |

<table>
<tr><td>MAGNITUDE OF COST</td><td>Magnitude of cost is only intended as a high-level starting point of the estimated cost range to implement a specific strategy. Given the complexity of climate action and lacking critical details such as current energy benchmarking or up-to-date asset management inventories, estimating the cost of implementation is expressed as a starting range of cost. The following symbology was used to express the potential starting point of cost ranges:
<table>
<tr><th>Cost Assumption</th><th>Cost Key</th><th>Planning/ Implementation Operations</th><th>Planning Capital (O & M TBD)</th><th colspan="2">“Initial” Implementation Cost</th></tr>
<tr><td rowspan="2">Minimal</td><td rowspan="2">$</td><td rowspan="2"><$100,000</td><td>(Direct costs)</td><td>Public (Incentives)</td><td>Private</td></tr>
<tr><td><$100,000</td><td><$100,000</td><td><$10M</td></tr>
<tr><td>Moderate</td><td>$$</td><td>$100,000- $500,000</td><td>$100,000- $1M</td><td>$100,000- $1M</td><td>$10-$100M</td></tr>
<tr><td>Substantial</td><td>$$$</td><td>$500,000- $1M</td><td>>$1M</td><td>>$1M</td><td>>$100M</td></tr>
</table></td></tr>
<tr><td>STATE AND REGIONAL COMMITMENTS/GOALS</td><td>Calls out the state or region’s parallel and supportive climate action-related commitments and/or goals. In some instances, recommended actions of the CAP may be superseded or considered duplicative of state or region goals-i.e., not necessary or in conflict.</td></tr>
<tr><td>EQUITY CONSIDERATIONS</td><td>As defined by U.S. EPA, “Recognizing and addressing the unequal burdens made worse by climate change, while ensuring that all people share the benefits of climate protection efforts.”</td></tr>
<tr><td>PROGRESS FROM 2020-2024</td><td>Many climate actions are already embedded within existing County programs and achieving the goals of the CAP. As may be applicable per each Implementation Strategy, progress made towards implementation is outlined in this section.</td></tr>
<tr><td>KEY PERFORMANCE METRICS</td><td>Quantifiable measurement and/or deliverable to gauge the progress of a specific Implementation Strategy.</td></tr>
<tr><td>2025 GOAL/ACTIONS</td><td>Potentially practicable actions and/or achievable programmatic goals towards beginning a specific Implementation Strategy rollout in fiscal year 2025.</td></tr>
<tr><td>PRIORITY TASKS</td><td>This section of the template outlines potentially important implementation tasks to achieve the goals or deliverables of a specific CAISP Implementation Strategy.</td></tr>
<tr><td>TASK</td><td>Though numbered, the Tasks listed under Priority Tasks are not sequential in order or intended to be a definitive list of what a lead agency must complete to implement the specific Implementation Strategy. The Tasks are meant as a starting point to help guide the lead agency(s) or entity(s) and provide transparency to help align Implementation Strategies with the CAP’s recommendations.</td></tr>
</table>

# IMPLEMENTATION STRATEGIES

## ACTION AREA:

# LEADERSHIP

**LIS-1: BUILD INTERNAL CAPACITY TO PLAN AND IMPLEMENT CLIMATE ACTION**

**LIS-2: INTEGRATE CLIMATE RESILIENCE CRITERIA INTO LONG-RANGE COUNTY PLANS, POLICIES, AND CIP PROJECTA AND ENSURE THERE IS A SUSTAINABLE SOURCE OF FUNDING TO IMPLEMENT THESE CLIMATE IMPLEMENTATION STRATEGIES**

**LIS-3: TRANSPARENCY, EQUITABLE ENGAGEMENT, AND CLIMATE INFORMATION**

# LIS-1: BUILD INTERNAL CAPACITY TO PLAN AND IMPLEMENT CLIMATE ACTION

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

To safeguard the health and well-being of County residents and to rapidly transition to a carbon-free economy, Prince George's County must build capacity to plan, implement, and evaluate necessary actions. This will include growing the climate-related knowledge and skills of County elected officials, Executive and Legislative Branch leaders, and agency directors and staff. It may also require the addition of new County staff with specialized knowledge and skills in order to assess climate change risk and vulnerabilities, develop and implement mitigation and adaptation strategies, ensure equity, and enable the County to emerge as a regional climate action leader. By creating a foundation within County government that understands the full suite of climate impacts and risks to the County and its residents, as well as the urgency, staff and leaders will be able to more effectively guide the County to meet the Climate Action goals. The Climate Action Implementation Plan will be reviewed, and Strategies will be updated, annually.

*Note that this strategy focuses on planning and staffing; Leadership Strategy 2 focuses on funding and process.

## WHY IT MATTERS

To effectively achieve its climate mitigation and resilience goals, it is imperative for the County to enhance its capacity for planning and implementing climate action. Staff members and elected officials equipped with climate knowledge and technical skills are in a stronger position to assess climate change risks and bolster resilience efforts. Building climate responsibilities into job descriptions across the County institutionalizes accountability for climate action and provides a foundation for collaboration towards shared goals.

Well-informed climate policies and programs are crucial in ensuring that the community is prepared to withstand and recover from climate change events. The potential social and economic costs could be substantial if proactive climate actions are not undertaken.


## MAGNITUDE OF BENEFIT

Building internal capacities for climate planning and action can establish strong climate resilience networks to tackle risks that are inflicting damage and causing losses across communities and sectors throughout the County. These networks can create opportunities to share information across agencies on projects and programs that have created positive outcomes and lessons learned from responding to past climate events. In addition to climate partnerships and projects, capacity building initiatives help strengthen collaborative efforts, equipping the County to better anticipate, identify, and consider potential impacts from climate hazards on economic and social activity, while ensuring equity and becoming a leader in climate action. While building greater climate awareness within existing staff positions, this could also provide new job opportunities for climate expertise, including environmental justice expertise, within the County staff. Establishing strong in-house expertise can reduce costs from unrecognized climate risks and identify how climate change impacts are felt locally and regionally. Providing a special focus for environmental justice when developing expertise can ensure a holistic approach, allowing all sectors and issues to be considered while planning to address adaptation needs. Finally, building capacity within the County to manage climate risks will reduce the need for the County to rely on external experts and to efficiently "mainstream" addressing climate risks within existing processes, such as standard capital improvements and long-range planning.

## MAGNITUDE OF COST

Table III–4. Magnitude of Cost

| Annual Cost Considerations | Planning costs (years 1-3) | Implementation costs (years 3 – goal end) |
|---|---|---|
| Existing staff/program | Y | Y |
| Program expansion | | TBD |
| New program and capacity needs | | |
| Current funding within the County budget? | See 2025 goals/actions below | |
| Private Sector Involvement | N | |
| Capital* | | |
| Operations | | |
| » Salary and Benefits | $$ | $$ |
| » Consultants | $$$ | $ |
| » Supplies and Materials | | |

**Assumptions*

## STATE AND REGIONAL COMMITMENTS / GOALS

» The Prince George's County Board of Education established the Climate Change Action Plan (CCAP) Focus Work Group in March of 2021 to develop a plan for meeting climate action goals. Public schools in the County will work together to hit emissions reduction targets and spread climate awareness.

» Maryland Senate Bill 457, passed in 2020, authorizes local governments to establish and fund a Resilience Authority under local law, which would enable a local jurisdiction to flexibly organize funding structure for and manage large-scale infrastructure projects specifically aimed at addressing the effects of climate change. A resilience authority could provide one means of building internal capacity to implement climate change resilience or mitigation projects.

» Maryland Senate Bill 528, the Climate Solutions Now Act of 2022, calls for a 60% reduction in greenhouse gases by 2031 compared to Maryland's 2006 baseline. It tasks the MD Department of the Environment with developing plans to achieve these targets, including the creation of the Climate Transition and Clean Energy Hub, the Just Transition Employment and Retraining Working Group, and the Maryland Climate Justice Corps Program, among others. These programs will bolster climate change expertise, resources, programs, and requirements throughout the state. Prince George's County must be able to respond and efficiently and effectively leverage and integrate similar initiatives into its operations and programs.

» The 2030 GHG emission reduction goals adopted by the Metropolitan Washington Council of Governments (COG) Board, of which Prince Geroge's County is a member, on October14, 2020 align with the level of effort called for by the Intergovernmental Panel on Climate Change (IPCC) to limit global warming to 1.5 degrees Celsius. COG Board Resolution R45-2020 established interim climate change goals including:

  - The climate mitigation goal of 50 percent greenhouse gas emission reductions below 2005 levels by 2030;
  - The climate resilience goal of becoming a Climate Ready Region and making significant progress to be a Climate Resilient Region by 2030; and
  - The need to incorporate equity principles and expand education on climate change into COG's Climate, Energy and Environment Policy Committee (CEEPC) and COG members' actions to reach the climate mitigation and resiliency goals

» Montgomery County's Climate Action Plan designates climate ambassadors within each department to promote sustainability and facilitate GHG reductions in their day-to-day operations. Climate Ambassadors meet quarterly. This can serve as a model for enhancing internal capacity for climate action planning in Prince George's County.

» The Maryland Climate Leadership Academy provides important continuing education and executive training to state and local governments, infrastructure organizations and the private sector to develop and implement sound climate change initiatives.

## EQUITY CONSIDERATIONS

- Improve hiring processes to attain more diverse climate action candidates and workforce, including targeted advertising of job announcements, reevaluating job requirements, and establishing a pipeline program to engage more applicants from underrepresented groups.
- Modify civil service laws and job descriptions and/or establish alternative career pathways within agencies such as enhanced interdisciplinary qualifications, honoring climate certificate programs as credentials, and embedding climate into other fields (e.g. finance, accounting, or wastewater specialists receive on-the- job or certificate training on climate change), because civil service job creation for climate action may not lead to additional employment opportunities for applicants without advanced degrees.
- Invest in career development opportunities, including climate- related professional development for career counselors, augmented offerings for workforce training at Prince George's Community College with special focus on the retraining of displaced workers, climate resilience summer youth employment programs, and an apprenticeship program that does not require higher education degrees for entry-level positions.
- Appoint or hire an Equity Liaison to guide messaging and to engage and solicit input from disenfranchised stakeholders and difficult-to-reach communities.

## PROGRESS FROM 2018-2024

**Planning:**

In 2021 the Draft Climate Action Plan was completed and submitted to the County Council by the Climate Action Commission and County Executive. In 2024, the initial draft of the Climate Action Implementation Plan, including 13 strategies to begin implementation in FY2025, and five (5) strategies that needed additional foundational work to be developed for FY2026 and beyond was delivered to the County Executive and County Council by the County Executive's Climate Action Implementation Task Force. The planning process, as described in tasks below, will continue as a part of County operations in the future.

This plan represents the publication of the initial 12 strategies to move towards Climate Resilience. Note that the Initial Implementation plan supports the uninterrupted, continued development of additional Strategies critical to Climate Action. These Strategies: AIS-2 Stormwater Standards, AIS-3 Land Use, AIS-9 Codes and Standards, MIS-11 Trees, and MIS-1 Renewables, will be submitted for recommendation to fulfill Climate Action Implementation Plan goals and commitments within one year of initial Plan approval. Implementation Plan Strategies will continue to be developed and refined on at least an annual basis.

**Staffing:**

In 2021, in response to the Climate Action Plan resolution passed by County Council, DoE began to include Climate Action responsibilities in the position descriptions of staff in the Sustainability Division and re-assign staff to that responsibility, particularly to the completion of the Climate Action Plan and more recently, this Implementation Plan. In FY2023, the Sustainable Energy team was moved to DoE and an assessment was done of needed staff to implement the recommendations from the Draft Climate Action Plan within the various divisions. In FY2024 a number of additional positions were assigned to DoE and OCS to support these efforts.

## KEY PERFORMANCE METRICS

N/A

## 2025 GOALS / ACTIONS

**Planning:**

- Climate Officer will be hired.
- DoE & OCS will complete onboarding of Climate & Energy Positions funded in FY24.
- DoE & the Climate Officer will coordinate completion of the remaining five (5) strategies.
- The CEX budget supports "staff augmentation" to utilize outside experts to support climate planning and implementation efforts.
- The CEX budget supports planning efforts of $1,405,000 to complete the underlying studies and pilot programs across the strategies, as well as build a Climate Reporting Dashboard and support public engagement (detailed in other strategies).
- The CEX budget supports up to $912,500 in grant matching funds through the DoE- that could leverage up to $200,000,000 in federal funds to support climate action planning and implementation.

# PRIORITY TASKS

## Task 1 Adopt the draft CAP, and develop a Climate Action Implementation Plan.

Adopt the recommendations of the Climate Action Commission in the Draft Climate Action Plan, integrate public comments, and commit to developing a County Implementation Strategy for Climate Action so that there is a roadmap for action, decision making and to facilitate obtaining grant funds. This document will be reviewed annually to track progress and add/adjust priorities to changing conditions, with Implementation Strategies being developed or refined on an annual basis.

The plan will serve as a living document to both set a roadmap for action, and to measure success.

| | |
|---|---|
| **Status March 2024** | Complete* |
| **Responsible Lead Entity** | DoE, Climate Action Implementation Task Force |
| **Secondary Partners** | Task Force Members:<br>1. The Director of the Department of the Environment or their designee, who shall serve as Chair;<br>2. The Director of the Office of Central Services or their designee, who shall serve as Vice-Chair;<br>3. The Director of the Department of Permitting, Inspections and Enforcement or their designee;<br>4. The Director of the Department of Public Works and Transportation or their designee;<br>5. The Director of the Office of Emergency Management or their designee;<br>6. The Director of Housing and Community Development or their designee;<br>7. The Director of the Housing Authority or their designee;<br>8. The Director of the Redevelopment Authority or their designee;<br>9. The Deputy Chief Administrative Officer for Economic Development or their designee;<br>10. The President of the Economic Development Corporation or their designee;<br>11. The Health Officer or their designee;<br>12. The Chair of the Maryland-National Capital Park and Planning Commission or their designee;<br>13. The Director of the Prince George's County Planning Department or their designee;<br>14. The Director Prince George's County Department of Parks and Recreation or their designee;<br>15. A representative designated by the Chief Executive Officer of Prince George's County Public Schools;<br>16. A representative designated by the County Council;<br>17. A representative designated by the Prince George's County Municipal Association;<br>18. A representative designated by the Resident Advisory Group;<br>19. A representative from FSC First; and,<br>20. Office of Management and Budget. |
| **Special Considerations** | *Note that while the initial Implementation plan is complete, Strategies will continue to be developed and refined on at least an annual basis. |

## Task 2 Commit to Climate Resilience and Climate Action.

Explicitly set climate change and resilience as community priorities at all branches of government. All County agencies will review their mission statement, and in their mission/vision/values or priorities, will include a statement reflecting their role in support of County goals for climate change and resilience. Development of this statement will be supported by the County Climate Officer.

| | |
|---|---|
| **Status March 2024** | Not Started |
| **Responsible Lead Entity** | Climate Officer, All County Agency Appointing Authorities |

## Task 3 Hire a Climate Officer in County Executive's Office.

Hire a Climate Officer to be responsible for coordinating County Climate efforts across multiple agencies and sectors. Develop a job description and identify possible candidates for a dedicated executive leadership position within the County Executive Office, independent of executive agency management, to represent climate action issues, facilitate cross-agency collaboration, and provide oversight/ transparency for Climate Action implementation.

| | |
|---|---|
| **Status March 2024** | In Progress, funding is being identified and a position description developed. |
| **Responsible Lead Entity** | County Executive |
| **Special Considerations** | While the actual work of Climate Action occurs inside of County Agencies, having a Climate Officer at the executive level to coordinate the work, provide metrics tracking and updates to the community, and support a centralization of effort for seeking grants and alternative funding will enable the work of Climate Action to move forward more smoothly and consistently. |

## Task 4 Develop a Climate Commission/Climate-Ready Leadership Team so that members of the public, private sector, and non-profit sector, community-based organizations, municipalities, will have an avenue to advise the County Executive's Climate Action Strategies.

A Climate Commission (Recommended Title: Climate Ready Leadership Team (to include members outside of County agencies)) should be selected and given the charge to:

- Receive monitoring and evaluation reports on climate risks, actions, and progress of implementing the County's Climate Action Plan and supporting strategies so that the Commission can make data-based, informed recommendations to the County Executive about climate mitigation and adaptation actions.
- Make recommendations to the County Executive to improve transparency of Climate Action.
- Make recommendations to the County Executive to update Climate Action Implementation Plan.
- Make recommendations to the County Executive on partners in Climate Action, including entities providing financial support/grants/financing etc.

## Task 4 (Continued)

» Make recommendations to the County Executive for internal operational incentives and issues which present an opportunity to adapt climate change approaches.

» Make recommendations to the County Executive on perceived barriers to County internal operations implementing climate change measures.

| | |
|---|---|
| **Status March 2024** | Not Started |
| **Responsible Lead Entity** | County Execuitve/County Council |
| **Secondary Partners** | Climate Officer (shall serve on commission and coordinate commission) |
| **Special Considerations** | Equity must be a part of selecting membership. |

## Task 5

### Establish an internal County structure to sustain climate action, such as a "Climate Cabinet" or "Inter-Agency Task Force."

Develop a structure that will enable funding for sustainable Climate Action, develop processes and procedures, provide training to County employees, and engage partners.

| | |
|---|---|
| **Status March 2024** | Under Development - to be considered at next Climate Action Implementation Task Force Meeting. |
| **Responsible Lead Entity** | Climate Officer (shall serve on and coordinate Task Force/Climate Cabinet) |
| **Secondary Partners** | Task Force Members/Agency Appointing Authorities |

## Task 6 Deliver/host a Prince George's County Climate-Ready Leadership Summit in FY2025 or FY2026.

Host a Climate-Ready Leadership Summit within 12-18 months after completion of the initial implementation plan. The Summit will focus on empowering County leaders to understand the opportunities to implement Climate Action within the portfolios of County agencies, and across the private and non-profit sectors. Attendees will include leaders in all County and Cross-Jurisdictional Agencies, Utilities, County Council as well as the Private and Non-Profit Sectors. Meetings will be open to the public and sessions by experts will be recorded for future training and development opportunities.

| | |
|---|---|
| **Status March 2024** | Not Started |
| **Responsible Lead Entity** | Climate Officer |
| **Secondary Partners** | County Executive Chief of Staff, Department of Environment, Office of Central Services |
| **Special Considerations** | The County's Climate Action Plan will impact land use decisions, community health, financial liability, and economic development opportunities. Leaders from businesses, municipalities and all sectors of County government, including elected officials, must enhance and expand their knowledge of climate risk management, as well as state-of-the-art methods for assessing vulnerabilities and designing solutions to avoid potential Countywide financial hazards resulting from failure to act on climate change.<br><br>Topics Covered may include:<br>» Financing and funding strategies for Climate Action<br>» Understanding Climate Science for non-experts<br>» Understanding the financial risk of Climate Inaction<br>» Understanding the economic opportunities for growth and benefits of Climate Action and long-term returns by committing to economically resilient development<br>» Opportunities for co-benefits for other portfolios, how to embed Climate Action in other core work<br>» Environmental Justice tools and opportunities<br>» Best practices from across the US/World<br>» A comparison of Prince George's County's efforts in the context of other jurisdictions<br>» Significant impacts to Prince George's County from major climate events in other parts of the country (such as regional food shortages, supply chain disruptions, mass migrations, and changes in the insurance industry)<br><br>The Climate-Ready Leadership Summit provides an opportunity to operationalize equity from the beginning, by including elements for accessing traditional knowledge/indigenous perspective and discussing equitable distribution of costs and benefits. These elements can be developed in collaboration with knowledge partners such as NAACP and UMD through its Environmental Justice Symposium. |

## Task 7 Hire and develop environmental justice and climate competence in County staff.

**Identify Staffing Needs**

Conduct a capacity assessment that estimates the additional and repurposed staff capacity per agency and programmatic budget needed across all government sectors to achieve Climate Action goals by 2030. Implementation will likely require additional staff and/or augmented staff capacity, which could be addressed by establishing ongoing partnership arrangements with other organizations to fill capacity gaps, manage climate initiatives and help with climate action implementation.

**Provide ongoing professional development for staff**

Ascertain an efficient way to train employees that balances depth and breadth (recognizing that some positions will require more in-depth training than others), and establish a recurrence interval for trainings. Support the training of staff in how to update plans, capital planning processes, etc. to incorporate resilience and the goals of this plan. Examples of the various options could include County-sponsored climate change lunch-and-learns for County employees, as well as regular updates on CAP implementation. It could also include the development of a Climate 101 training module to familiarize staff with climate impacts and solutions and to build a culture of climate-conscious decision-making at all levels of government service.

**Integrate climate change knowledge and skills in filling job descriptions when hiring new staff or when filling open positions.**

Ascertain the best way to integrate climate into job requirements and develop a process (i.e., start with new positions or all positions as they open and are filled?). Ask questions such as "who needs climate knowledge and skills, and how much do they need?" to determine what knowledge and skills should be incorporated into which jobs. The Climate Director/Officer and Task Force should work with agencies to support their development of job descriptions.

| | |
|---|---|
| **Status March 2024** | Not Started |
| **Responsible Lead Entity** | OHRM |
| **Secondary Partners** | DoE, DPW&T, all hiring agencies |
| **Special Considerations** | Equity is a critical part of the hiring process. Some demographics of employees do not have equal access to scientific careers, etc., and so it is important to invest in current staff and be willing to invest in future staff to develop expertise rather than always expecting it upon hiring. |

# LIS-2: INTEGRATE CLIMATE RESILIENCE CRITERIA INTO LONG-RANGE COUNTY PLANS, POLICIES, AND CIP PROGRAMS AND ENSURE THERE IS A SUSTAINABLE SOURCE OF FUNDING TO IMPLEMENT THESE CLIMATE IMPLEMENTATION STRATEGIES

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Build climate action, including emissions reductions and management of climate risk, into everything the County does. This strategy focuses on the process of developing and embedding these criteria in County work, as well as funding climate action.

## WHY IT MATTERS

As highlighted in the Draft Climate Action Plan, Prince George's County residents have already experienced the impacts of climate change first-hand, such as more days with extreme heat, flooding, and air pollution. It is necessary to revisit existing policies and plans to ensure they account for the changing climate, so they still produce the benefits intended for the community. Important community improvement projects, such as infrastructure upgrades and building retrofits, also need to take climate change into account so they can continue to perform and produce outcomes as desired. By integrating climate resilience criteria into existing plans and policies, the County can ensure climate change considerations are incorporated and reduce damage from climate hazards to the community.

## MAGNITUDE OF BENEFIT

Incorporating climate resilience into all aspects of the County's operations will have far-reaching benefits. Integrating climate resilience criteria into long-range County planning can help identify current and future climate-driven impacts and ensure new policies, programs and projects can produce long-term social and economic benefits. These benefits include avoiding losses associated with extreme weather events, creating new jobs and training opportunities, increasing energy reliability and efficiency and use of clean, green energy, and generating co-benefits for communities and the environment. Incorporating climate projections into infrastructure projects helps ensure that best practices are used when siting, designing, and operating climate resilient natural and built infrastructure and can prevent the losses associated with extreme weather events, such as lost wages, healthcare costs, and damage

**Fordham Street | Before**

**Fordham Street | After**

to property and infrastructure. Often, these losses amplify environmental justice issues and are felt more intensely by low-income and already overburdened communities. Additionally, integrating climate resilience into County programming and action will ensure that communities are better prepared to deal with extreme events. By focusing on a combination of mitigation and resilience activities, Prince George's County will ensure that the entire County is better prepared to deal with the future.

Climate resilient improvements to infrastructure can be multifunctional, producing improved outcomes for communities and the environment. For example, traditional ("gray") stormwater infrastructure can be replaced or supplemented with "green" stormwater infrastructure in the form of stormwater parks[1] and rain gardens. These areas can provide valuable recreation space and more connectivity, potentially giving pedestrians and cyclists access to stores and other commercial areas now available through the pathways supported by green infrastructure. An analysis from the National Institute of Building Sciences estimated that natural hazard mitigation saves $6 on average for every $1 spent on federal mitigation grants.[2] Improvements to infrastructure and green space access can also have design elements that increase the County's tree canopy. In 2013, using 2009 data, the County estimated that each year the tree canopy removes more than 5,100 metric tons of air pollution worth $21 million and absorbs 211,000 metric tons of carbon worth $16.6 million, storing 5 million metric tons of carbon valued at $395 million over the forest's lifetime.[3]

## MAGNITUDE OF COST

Table III–5. Magnitude of Cost

| Annual Cost Considerations | Planning costs (years 1-3) | Implementation costs (years 3 – goal end) |
|---|---|---|
| Existing staff/program | Y | Y |
| Program expansion | | |
| New program and capacity needs | | TBD |
| Current funding within the County budget? | Y | |
| Private Sector Involvement | N | |
| Capital | | |
| Operations | | |
| » Salary and Benefits* | | $$ |
| » Consultants* | $$ | $$ |
| » Supplies and Materials | | |

**Assume that most costs will be covered by budget and future budget allocations for staff and consultants*

## STATE AND REGIONAL COMMITMENTS / GOALS

- Maryland Greenhouse Gas Emission Reduction Act of 2009 established as law achieving 40% emissions reduction below 2006 by 2030.
- Maryland's 2030 Greenhouse Gas Emission Reduction Act Plan called for a stretch goal of achieving 50% emission reduction by 2030.
- The Climate Solutions Now Act of 2022 increased this goal to 60% by 2031. Climate resilience is part of the overall goal set established in these legislative packages.
- SB0630/HB0706 established an Office of Resilience in the Maryland Department of Emergency Management
- Chapter 429 of 2015—Maryland's HB 514 requires each state agency to annually review its programs to improve their integration of greenhouse gas emissions reduction goals and the impacts of climate change. Since, all state agencies have been required to include sea level rise, storm surges and flooding, extreme weather events, and increased precipitation and temperature.
- State permitting processes—including the Maryland Public Service Commission's Certificate of Public Convenience and Necessity (CPCN), which is required to construct or modify generation and transmission—consider climate risk in their evaluations. Legislation to require this of other state permitting processes have been introduced in the General Assembly.
- The Resilient Maryland Program, administered by the Maryland Energy Administration, supports distributed energy resource (DER) system development and installation incentives to help Maryland communities and organizations plan, design, and construct microgrids, resilient facility power systems, and resiliency hubs.

## EQUITY CONSIDERATIONS

- Prioritize implementation of County projects in underserved and overburdened communities when making improvements, upgrades, and replacements to critical infrastructure (e.g., bridges, roads, storm drain system upgrades and repairs, land acquisition for green spaces).
- Ensure community input is part of the initial evaluation process when ranking and prioritizing climate resilient capital improvement projects.
- Consider a formal set-aside in significant capital projects (e.g., all projects with budgets over $2 million) – for the sole purpose of funding an equitable priority project.
- Develop a structured mechanism for tracking and quantifying equity-based outcomes for government-led development and CIP improvement projects.
- Measure environmental, social, and economic outcomes of projects (the "triple bottom-line") in the County's economic development process.

## PROGRESS FROM 2018-2024

For the FY25 budget, agencies identified enhancements to their baseline budget which fit into the broad categories of Climate Action. The impact on Climate goals was considered as one of the factors in prioritizing projects and expenditures. The Department of Environment contracted with outside experts to evaluate funding structures including a grants center and a resilience authority, the reports of those evaluations with further recommendations are anticipated in summer 2024.

## KEY PERFORMANCE METRICS

This Strategy is measured qualitatively as well as quantitatively where possible using metrics derived from the tasks. Such metrics may include, for example: number or percent of CIP projects that include climate considerations in design or green and nature-based features; percent of agency guidelines, regulatory requirements, and technical manuals that have been updated to include climate change criteria; and percent of departments and agencies that have embedded climate resilience, energy efficiency, and greenhouse gas reduction strategies into daily operations.

## 2025 GOALS / ACTIONS

- The CEX budget supports planning efforts of $1,405,000 to complete the underlying studies and pilot programs across the strategies, as well as build a Climate Reporting Dashboard and support public engagement (detailed in other strategies)
- The CEX budget supports up to $912,500 in grant matching funds through the Department of Environment- that could leverage up to $200,000,000 in federal funds to support climate action planning and implementation.
- FY2025 will primarily focus on completing and reviewing foundational pieces of Tasks described on the following page.

# PRIORITY TASKS

## Task 1 Develop a core set of climate resiliency criteria and a methodology for evaluating climate impacts/benefits and equity impacts/benefits of operational and CIP projects.

Define what climate resilience means for the County and adopt this across all County agencies. Ascertain what criteria may have already been adopted that support mitigation and adaptation objectives and identify gaps to address. To the extent possible, develop a core set of climate resilience criteria that are consistent across agencies, sectors, and projects and include equity considerations for evaluating and reviewing plans and programs. Develop additional sector-specific criteria as needed. These climate resilience criteria should be science-based and incorporate current climate risks and future projections. Relevant criteria should be updated accordingly after receiving and adopting the latest information on climate risks and projections.

| | |
|---|---|
| **Status March 2024** | Not Started |
| **Responsible Lead Entity** | Climate Officer |
| **Secondary Partners** | OMB/Implementing Agencies |

## Task 2 The internal "Climate Cabinet" or "Inter-Agency Task Force" (described in Task 4 of Leadership Strategy 1) will integrate climate mitigation and adaptation into all County plans, policies, and CIP and operational budgets and programs.

After the climate criteria are developed, begin integration of criteria into the County structure. For example:

- Integrate climate action into County planning documents, policies, ordinances, regulations, permitting processes, and internal practices.
- Incorporate current climate risks and future projections when updating policies and making decisions.
- Track these integration efforts and share progress via transparent communication processes (such as the website and other avenues described in Leadership Strategy 3).
- Embed climate resilient priorities into the County's investment and economic development decision-making processes.
- Ensure staff and decision makers are trained as processes are developed and implemented (See Leadership Strategy 1).
- **Planning:**
  - Integrate recommended climate actions within all County master plans and policies.
  - Conduct a crosswalk of all planning documents to identify any climate action-related initiatives, projects or missed opportunities.

**Task 2 (Continued)**

- Create a resilience work program within M-NCPPC Planning to integrate resilience into sector plans.
- Require explicit consideration of impacts on greenhouse gas emissions, energy efficiency, vehicle-miles traveled, climate resilience, and waste management.
- Identify instances where plans, policies, or ordinances disincentivize climate action and/or contain clauses that allow waivers, exemptions, or variances that undermine climate action.
- Track outcomes of permitting processes, as well as waivers and variances issued.

» **Procurement:**

- Include a set of "boilerplate" language that can be used to prioritize procurement with positive impacts on greenhouse gas emissions, energy efficiency, vehicle-miles traveled, climate resilience, and waste management.
- Establish a baseline and target for reducing emissions associated with the County's public food purchasing. Adopt strategies from the low-carbon resilient food system study as it relates to the County's food procurement policies.

» **Capital Expenditures**

- Integrate resilience criteria into programs for purchase and replacement of County-owned assets.

» **Asset Management**

- Integrate climate risk into all County asset management processes. Develop and maintain a detailed inventory of County assets (adding natural assets if not included), and then assess and document the vulnerability of the County's built infrastructure and natural assets to climate change. Update maintenance, upgrade, and replacement schedules accordingly to account for climate impacts.

» **Capital Improvement Projects**

- Develop a process to evaluate the climate impact and environmental justice/equity impact of both individual CIP projects and the portfolio of County projects as a whole to ensure that the impacts and benefits are equitably apportioned to all residents.
- Use science-based climate resilience standards to inform land development decisions for all government development and major CIP projects.
- Develop procedures and tools (such as scoring sheets) to support the climate resilience review process.
- Prioritize climate-resilient projects (as determined by criteria developed in Task 1) for capital improvement investments.
- Create a transparent project prioritization process for project selection and funding allocation for all Capital Improvement Program (CIP) projects, that weighs climate and other critical considerations when making funding and prioritization decisions.
  - Review opportunities for the use of science-based climate resilience, energy efficiency, and greenhouse gas reduction criteria (per Task 1) for evaluation and prioritization of CIP.

**Task 2 (Continued)**

- Prioritize infrastructure improvement projects and climate resiliency projects within underserved and climate-vulnerable communities for fast-tracked funding with a streamlined permit and design process.
- Review opportunities for comprehensive neighborhood improvements, rather than piecemeal repairs or upgrades, within underserved and climate-vulnerable communities. For example, when replacing a sidewalk or curb and gutter on a street in a flood-prone equity area, a replacement project must also include recommended climate resilience measures such as adequate space for trees and using heat cooling permeable paving instead of concrete.

» **Operations**

- Incorporate climate criteria/climate risk into emergency management and public safety (police, hospitals, targeted government operations).

» **Codes and Standards**

- Work with the cross-departmental task force to integrate the criteria developed under Task 1 into codes, standards, and practices (A-9 Codes and Standards).

» **Development Project Review and Permitting Processes**

- Establish a transparent climate resilience review process for development plans. Include climate resilience criteria (Task 1) as well as criteria that take into account the status of natural resource indicators in the County (e.g., tree canopy, wetlands, floodplains) for evaluating the project. Include these criteria in memos that are conveyed from staff to decision-makers, and make documents and decisions publicly available.
  - Consider requiring submittal of predevelopment Environmental Impact Statements (EIS) for projects that rely on public resources before funding or consideration for land transfers, request for proposals, or proposed redevelopment of land parcels for economic development. EISs should meet standards required for successful application for federal funding to increase County access to funds needed for implementing the Climate Action Plan.
  - Consider establishing an independent Environmental Assessment Panel including agency experts and community representatives to review all proposals for disposition of County lands. The Prince George's County Climate Resiliency Land Trust (MIS-11 Task 8) will receive first right to transfer forested land and land designated as part of the County's regulated Green Infrastructure Network. This includes priority selection over land transfer to the State of Maryland or its entities. The Environmental Assessment Panel can assess and report on the following:
    - Evaluate positive and negative impacts of the potential redevelopment with regards to compliance with the Climate Action Plan and Plan 2035, as well as overall environmental impacts.
    - Evaluate traffic and health impacts to the surrounding communities.
    - CEX or designee or Council / designee should provide a public briefing report to the Prince George's County Resiliency Authority (future Authority), DoE, and County Executive Climate Action Liaison (future liaison) with ultimate

**Task 2 (Continued)**

recommendation to the County Executive and County Council before the project can move forward for funding or next phase of design development.

- Consider requiring the inclusion of the following in RFPs for land development planning purposes by the County (which are released to the public for bid or comment before adoption):
  - Existing tree canopy potentially lost by the development.
  - Impervious area created or removed.
  - Satellite imagery of the proposed site and surrounding areas with all-natural resources, streams, floodplains, ecosystem features, and location of 311 calls over the last five years for flooding and drainage issues in the surrounding areas.
  - Climate Resilience score as informed by the EIS and Environmental Assessment Panel.
- Create tools and checklists that help projects move more efficiently, help eliminate disparities in information and access, for example, consider the following:
  - Create a Resilience Checklist that lays out the permit review process and demonstrates how new buildings will meet the revised code requirements as well as any other requirements, such as updated codes and standards ( see Future Strategy on Codes and Standards).
  - Create a document for the public to understand the opportunities during the development process to ask questions and voice opinions, as well as any legal rights to challenge actions.
  - Create a centralized website, that provides information of value to government, and members of the public about where projects are in the pipeline of development.
  - Create a centralized website that shows all government construction/development projects and their status & purpose.

| | |
|---|---|
| **Status March 2024** | Not Started |
| **Responsible Lead Entity** | County Agencies/Inter-Agency Task Force |

**Task 3**

## Identify opportunities to secure new financing for climate resilience projects, and determine a structure to most effectively obtain that financing.

Determine both an appropriate structure and processes to obtain funding.

- Review options for a Grants Center, whether within a central office (such as reporting to the CAO or a Deputy-CAO or within OMB) or as hub-and-spoke or distributed model with specialists in core agencies to obtain grant funding.
- Enlist experts to advise leadership regarding whether a Resilience Authority is an appropriate and feasible mechanism for meeting the County's needs to support Climate Strategy implementation. Determine if an existing authority in the County has the capacity to fill this role.

**Task 3 (Continued)**

- Perform a valuation analysis of County resources to identify opportunities for leveraging County assets and property value to secure new financing for climate resilience projects.
- Recommend strategies to develop joint planning and financing infrastructure investments across municipalities, utility jurisdictions, and the County.
- Recommend strategies to redesign existing County investment plans to combine Countywide revenues and incentives for private investment in fair and equitable ways.
- Review partnership options, and develop a list of potential partners for applying to grants opportunities and developing public-private-partnerships.
- Review opportunities for private sector, non-profit and other alternative financing mechanisms.
- Review opportunities for cross-sector collaboration between County agencies and partnership with regional authorities to achieve mutual goals, raise and leverage funding, and implement community-wide initiatives.
- Review opportunities for partnership with universities, municipalities, regional government, transit and rail agencies, utilities, and County agencies to identify and jointly pursue state and federal grant funding.

| | |
|---|---|
| **Status March 2024** | Evaluation of grants center and resilience authority in progress. |
| **Responsible Lead Entity** | DoE/OMB |

**Task 4**

## Apply sustainable funding mechanisms and structure to prioritize climate action.

Upon completion of Analyses and Planning Tasks, the final step will be full implementation of the structures and mechanisms defined. This task will be more fully developed in future iterations of the Climate Implementation Plan.

| | |
|---|---|
| **Status March 2024** | Preliminary efforts made in FY25 budget development process. |
| **Responsible Lead Entity** | Climate Lead Position (CAO's Office)/OMB |

**Task 5**

## Lead by Example by reducing the environmental impacts of day-to-day County operations through initiatives to transition to renewable energy, decrease greenhouse gas emissions, increase energy efficiency, decrease vehicle-miles traveled, and decrease waste.

Expand existing and launch new internal initiatives to reduce the environmental impacts of County government operations.

Potential initiatives may include:

- Issue Countywide guidelines and recommendations on climate-smart operational and behavior changes, increase energy efficiency, reduce waste, and conserve water in all County facilities.

**Task 5 (Continued)**

- Landscape and garden maintenance operations to convert to battery or electric-powered small lawn and garden equipment.
- Conversion of all mowing equipment to hybrid power or all-electric.
- Conversion of all mowing equipment to hybrid power or all-electric by 2025.
- Adopt green IT and office equipment best practices by identifying what is covered by the Department of Environment's (DoE) green IT policy and best practices, determine where there is room for improvement in other departments' and agencies' IT practices, and expand these policies and practices to other government entities.
- Have County-owned facilities and parks to identify opportunities and implement plans for reducing lawns and impervious surfaces, increasing conservation landscaping and naturalization, increasing tree planting, reducing parking area, improving water conservation measures, and protecting natural areas from unneeded mowing.
- Create a green procurement system that enables preferential use of sustainable goods and professional environmental services through a streamlined purchase system.
- Green all County-sponsored events.
    - Develop a checklist of green event practices for use throughout the County.
    - Locate events close to transit and provide directions for attending via public transportation.
    - Establish zero waste guidelines for County events (e.g., ban single-use beverage containers and disposable packaging, dishes, and utensils).
    - Eliminate plastic marketing materials or giveaways by the County.
    - Require the provision of locally grown and locally produced food for all catered public events.
    - Increase availability of vegetarian and low-meat options at County events.
    - Highlight zero waste and low-carbon features at County events.

| | |
|---|---|
| **Status March 2024** | Preliminary efforts made in FY25 budget development process. |
| **Responsible Lead Entity** | Climate Task Force/Climate Officer |
| **Supporting Entities** | Office of Central Services- County Facilities<br>Chief of Staff- County-sponsored events<br>Office of Information Technology/Office of Human Resources Management- Green IT policies<br>M-NCPPC- Park Facilities and Programs<br>PGCPS- School Facilities and Programs |

# L-3: TRANSPARENCY, EQUITABLE ENGAGEMENT, AND CLIMATE INFORMATION

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Track and communicate progress on Climate Resilience in a transparent way. Inform the public of climate impacts and risks and educate them about actions they can take, as well as about County resources that are available to them. Empower all community sectors to take the actions necessary to address climate change. Ensure that underserved and overburdened communities can access and participate in the process and that investments in Climate Resilience are inclusive and equitable.

## WHY IT MATTERS

Robust, equitable community engagement is necessary to ensure that climate action reflects community needs and is targeted to advance multiple community goals such as economic development, improved public health, or social justice. Collaboration, transparency, and participatory engagement is beneficial for stakeholders throughout the County. Such an approach encourages and empowers individual agency and collective ownership of climate action by non-profits, community groups and organizations, private sector businesses, HOAs, civic associations and municipalities, as well as across all public County departments - for the success of the Climate Action Implementation Plan. By implementing a program of open messaging, education, and outreach, Prince George's County can gain input and support from the community and empower community members to take action. Intentional and dedicated outreach efforts are especially important to engaging underserved and overburdened communities who may have less access to web resources and education. By sharing the County's progress and success as it leads by example, and sharing resources and locally-relevant information in a streamlined and easy to access format, the County can build trust within the community, demonstrate sustainability initiatives, raise awareness of potential climate risks and impacts, and motivate community members to undertake climate action within their own lives and businesses. With engagement of the community in a collaborative manner and integration of climate resiliency into all of its processes, the County can further establish itself as a climate leader in the region.

## MAGNITUDE OF BENEFIT


Increasing awareness of the community and stakeholders about climate impacts and informing them of resources and actions to mitigate adverse effects can empower community members to undertake actions that reduce overall GHG emissions, increase investment in buildings and properties across the County, and result in greater climate resiliency. Environmental education has been shown to increase individuals' willingness to participate in sustainable and environmentally friendly behaviors,[4] and studies have shown that environmental governance can significantly improve happiness.[5] By spurring and supporting action at the individual level, the County could achieve progress at greater scale and foster economic growth. For example, educating the community about the benefits of renewable energy and resources to support its investment, such as in installing solar, could grow the renewable energy industry, supporting workforce development and retraining, job opportunities, and reduced energy bill costs over the lifetime of the renewable energy system. Increased improvements in energy efficiency could reduce the need for some public services, such as utility bill payment assistance, by reducing utility costs through energy and water efficiency improvements. Transparent and equitable engagement can also provide social co-benefits by connecting the community, removing communication and language barriers, fostering inclusive discussions about climate awareness, and promoting equity.

## MAGNITUDE OF COST

| Cost Considerations | Planning costs (years 1-3) | Implementation costs (years 3 – goal end) |
|---|---|---|
| Existing staff/program | Y | |
| Program expansion | Y | |
| New program and capacity needs | | TBD |
| Current funding within the County budget? | Y | |
| Capital | | |
| Operations | | |
| » Salary and Benefits* | $ | $ |
| » Consultants | | |
| » Supplies and Materials | $ | $ |

*Assume additional staff needs as the program expands.

## STATE AND REGIONAL COMMITMENTS / GOALS

» Maryland Department of Natural Resources hosts a park equity mapping tool that combines demographic and environmental health data to identify disparities in park access and quality. (includes only M-NCPPC parks at this time, not municipal parks). This tool is helpful for County planners to identify areas in need of more green space and consider equitable distribution and access to communities across the County.

» Code of Maryland Regulations (COMAR) 13A.04.17.01, Requirements for Environmental Literacy Instructional Programs for Grades Prekindergarten – 12: As of 2023, Maryland has had an institutional Environmental Literacy program that requires all public schools (from prekindergarten to Grade 12) to

include a "comprehensive, multi-disciplinary environmental literacy program infused with current curricular offerings and aligned with the Maryland Environmental Literacy Standards." The Prekindergarten to Grade 12 Environmental Literacy Framework was released in March 2023.

- In 2008, Governor O'Malley issued an Executive Order to establish the Maryland Partnership for Children in Nature, with the goal of promoting outdoor, experience-based environmental education for Maryland youth. Since 2008, the Partnership has expanded to elevate environmental literacy, strengthen the partnership, and expand membership and capacity and renew commitment to ensure every child in Maryland has the opportunity to experience, understand, and learn to conserve the natural environment.
- Maryland Association for Environmental and Outdoor Education (MAEOE) is a non-profit association promoting environmental awareness through teaching program managers, teachers, resource managers, and more on environmental education. This organization helps improve environmental literacy and community engagement throughout the State.
- Maryland Department of the Environment (MDE) is conducting environmental justice listening sessions throughout the state to hear the concerns and experiences of populations in underserved and overburdened communities. Collaboration between the state government and local communities is key for effective climate action.

## EQUITY CONSIDERATIONS

- Ensure that underserved and overburdened communities can access and participate in the process and that investments in Climate Resilience implementation are inclusive and equitable.
- Consider establishing routine leadership and task force meetings within underserved, climate-vulnerable, and aging communities. This will also enable community members to attend by meeting people where they are.
- Enroll local faith-based, nonprofit, and community organizations as leaders in engaging their communities in taking individual and collective action on climate change.
- Share progress on Climate Resilience implementation in a transparent way.
- Make educational materials available in multiple languages and formats (including non-digital) for accessibility by individuals with diverse backgrounds, learning styles, technological access, and language abilities.
- Remove communication barriers for residents with disabilities and health issues (eyesight, hearing) that could impact relaying important climate-related information and opportunities.
- Develop multilingual-enabled websites and communication materials that are easily accessible for the public, and deliver information through multiple channels, including online, in-person, and through trusted organizations and messengers.
- Commit to providing free nondigital communication equipment for underserved and climate-vulnerable communities in tandem with the creation of a "Buddy System" to relay emergency information.
- IIJA and IRA funding opportunities also require and encourage equitable community engagement processes.

## PROGRESS FROM 2018-2024

To date, these metrics have largely been kept inside of the individual agencies, and published in their annual reports, as part of the budget process, or on their webpages. The initial dashboard, which will be published in April 2024, will be the first combination of these metrics/accomplishments onto a consolidated Countywide webpage.

## KEY PERFORMANCE METRICS

While much of the progress in this area is hard to quantify, tools such as pre- and post- engagement in-person and online surveys can be used to assess knowledge of impact of climate change on individuals and communities and confidence that they can take individual and collective positive action to address climate change.

## 2025 GOALS / ACTIONS

- The CEX budget supports planning efforts of $1,405,000 to complete the underlying studies and pilot programs across the strategies, as well as build a Climate Reporting Dashboard and support public engagement (detailed in other strategies)
- By April of Claendar Year (CY) 2024, a preliminary dashboard with progress to date, and these strategies, will be available.
- By Autumn CY2024, an interactive dashboard will be available online for residents, and will be updated at least two-times-per-year thereafter with the newest data and information
- The CEX budget supports up to $912,500 in grant matching funds through the Department of Environment- that could leverage up to $200,000,000 in federal funds to support climate action planning and implementation.
- In FY2025, Specific, Measurable, Achievable, Relevant, and Time-Bound (SMART) Climate Goals that are both specific to the strategies and cross-cutting will be developed for the initial 12 published strategies. In alignment with the values and strategies expressed across this report, County leaders will develop key metrics used to measure and manage climate-related risks and opportunities.
- In FY2025, Office of Emergency Management (OEM), Department of Environment and Department of Public Works and Transportation will expand efforts to educate residents on flood risks and flood mitigation efforts.

# PRIORITY TASKS

## Task 1 Meaningfully engage community members in Climate implementation at the County government level and in communities.

Develop and implement a comprehensive, inclusive climate resiliency stakeholder engagement plan to engage and educate residents about climate change impacts and resilience solutions.

This plan should support other steps in this strategy where appropriate and also:

- Establish a process to coordinate dialogue between County agencies and municipalities to strengthen communications and share resources to implement climate strategies.
- Integrate climate change considerations with the Equity and Social Justice Strategic Plan, as well as commitments at the County, state and federal[6] level, and apply what is learned from that engagement process to shape future engagement on climate action and resilience.
- Evaluate current outreach efforts and identify gaps (e.g., topic, sector, demographics, language, geography, etc.).
- Identify specific communications and outreach strategies for engaging vulnerable populations, youth, homeowners, and municipalities so that they can help shape climate action decisions and are better able to access information and assistance.
- Partner with schools, non-profit groups, community organizations, faith-based groups and other private entities to develop effective messaging and programs to reach general audiences Countywide.
- Expand the existing County Executive's Prince George's Proud campaign to include evidence-based communication to inspire climate action and community resilience as part of all litter and beautification topics.
- Create Countywide recognition programs for businesses and residents who exemplify excellence, meet new benchmarks, create clean-energy jobs, and embrace new climate mitigation and adaptation recommendations.
- In addition to a formal Climate Commission - establish and formalize Resident Advisory Group/Groups to inform ongoing implementation of the Climate Action Plan. The Resident Advisory Group should be an inclusive, active, diverse group of County residents from every district and should have the full support of County leadership.
- Empower the Resident Advisory Group/Groups to interact with the Climate Commission to ensure agencies are provided with the education and resources needed to implement and motivate needed change throughout County operations.
- Empower the Climate Commission and Resident Advisory Group/Groups to meet with relevant County departments heads or designees for Plan progress updates and follow-on discussion. Such interaction will build public trust for the County's implementation process and help to inform government leadership of residents' ideas for procurement, transportation, land use, and infrastructure.
- Promote available technical and financial assistance through community-based

organizations and at community events, and further expand outreach at senior centers, community centers, libraries, and schools.

» Create public engagement events such as Sustainability Days or Climate-Ready Drives that involve local businesses.

| | |
|---|---|
| **Status March 2024** | This report. |
| **Responsible Lead Entity** | Climate Officer |
| **Secondary Partners** | All County Agencies |

## Task 2 Develop climate resilience goals & metrics.

Develop Specific, Measurable, Achievable, Relevant, and Time-Bound (SMART) Climate Goals that are both specific to the strategies and cross-cutting. In alignment with the values and strategies expressed across this report, develop key metrics used to measure and manage climate-related risks and opportunities.

| | |
|---|---|
| **Status March 2024** | Some preliminary metrics that are already tracked by agencies are being collected, as well as progress on Climate Implementation strategies to date. These will be provided in this report and/or on the Climate Implementation Dashboard. |
| **Responsible Lead Entity** | Climate Officer |
| **Secondary Partners** | All County Agencies with relevant data |

## Task 3 Track climate resilience methods on a public dashboard.

Share quantitative and qualitative progress via a dashboard on Climate Resilience web page on the County website (detailed under Leadership Strategy 3 Step 5).

| | |
|---|---|
| **Status March 2024** | Preliminary Dashboard scheduled to be released April 1, 2024 in celebration of Earth Month. |
| **Responsible Lead Entity** | Climate Officer |
| **Secondary Partners** | All County Agencies with relevant data |

## Task 4 Track climate implementation progress and report annually.

Create and follow a transparent system for tracking Climate Resilience implementation, evaluating results, and communicating progress to the public. Track progress on a regular basis and report results within the County and to the public. Monitor progress and evaluate effectiveness of and challenges with Climate Resilience implementation. Report annually in the Climate Implementation Strategies Report.

Additional considerations for monitoring and tracking include but are not limited to:

**Task 4 (Continued)**

- How climate action is integrated into County planning, capital improvements, procurement, repair, and replacement programs
- Outcomes of permitting processes, as well as waivers and variances issued
- Which design guidelines, standards, and manuals are in the process of being updated or have been updated
- How the County manages climate-related financial risks and opportunities
- Provide annual updates to the County Council on the progress of this integration effort
- Link to relevant state and federal tracking related to how the County's actions work towards these larger goals
- Indicators of natural resources that will be also considered in development review (e.g., tree canopy, wetlands, floodplains)

| | |
|---|---|
| **Status March 2024** | This plan represents the publication of the initial 12 strategies to move towards Climate Resilience. Note that the Initial Implementation plan supports the uninterrupted, continued development of additional Strategies critical to Climate Action. These Strategies: AIS-2 Stormwater Standards, AIS-3 Land Use, AIS-9 Codes and Standards, MIS-11 Trees, and MIS-1 Renewables, will be submitted for recommendation to fulfill Climate Action Implementation Plan goals and commitments within one year of initial Plan approval. Implementation Plan Strategies will continue to be developed and refined on at least an annual basis. |
| **Responsible Lead Entity** | Climate Officer |
| **Secondary Partners** | All County Agencies |

**Task 5**

### Provide information and resources to the public to build awareness of climate impacts and to support community members' climate actions.

Conduct outreach to the wider community about climate risks and impacts in Prince George's County, about ways to mitigate emissions and build resilience, and about why taking action at both the government and community levels is important and beneficial. Use the stakeholder engagement plan, assessment of existing program knowledge and participation, etc. to inform improvements in community education and engagement efforts.

## FUTURE TASKS UNDER DEVELOPMENT

**Task: Develop toolkits for residents, HOAs, businesses, and municipalities regarding different climate resilience strategies.**

**Task: Improve awareness and utilization of existing support programs, services, and information that are relevant to CAP recommendations.**

**Task: Build partnerships to expand climate education.**

**Task: Coordinate workforce development across strategies.**

## SECTION III LEADERSHIP ENDNOTES

1 For example, recreational spaces that are designed to flood during extreme events.

2 Federal Insurance and Mitigation Administration. Mitigation Saves. 2018 Factsheet. Mitigation Saves Fact Sheet (fema.gov)

3 Prince George's County Department of the Environment. Understanding the Relationship Between Land Use Practices & Climate Change. 2021. https://princegeorgesCountymd.gov/sites/default/files/media-document/dcv36878_cap-trees-and-climate-change-july-23-2021.pdf

4 Effects of Climate Change Knowledge on Adolescents' Attitudes and Willingness to Participate in Carbon Neutrality Education - PMC (nih.gov)

5 Sustainability, 2017. Environmental Governance, Green Tax and Happiness – An Empirical Study Based on CSS (2019) Data. https://www.mdpi.com/2071-1050/14/14/8947#:~:text=The%20results%20show%20that%3A%20%281%29%20environmental%20governance%20can,and%20mediating%20effects%20of%20environmental%20governance%20on%20happiness.

6 Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government. https://www.whitehouse.gov/equity/ and subsequent related executive orders.

# IMPLEMENTATION STRATEGIES

## ACTION AREA:

# MITIGATION

**MIS-1: EQUITABLY TRANSITION TO A RESILIENT AND RENEWABLE ENERGY SYSTEM**

**MIS-4: EQUITABLY TRANSITION TO ZERO EMISSIONS VEHICLES**

**MIS-6: ADOPT INTERNAL POLICIES TO ENHANCE RESILIENCE AND REDUCE VMTS OF COUNTY EMPLOYEES**

**MIS-8: ACCELERATE IMPLEMENTATION OF DEEP ENERGY RETROFITS AND COMMUNITY-WIDE EFFICIENCY AND WEATHERIZATION EFFORTS**

**MIS-9: ESTABLISH AND ADOPT BENCHMARKING ENERGY AND CONSERVATION STANDARDS**

**MIS-10: EXPAND COUNTY WASTE REDUCTION AND DIVERSION EFFORTS**

**MIS-11: MAINTAIN A CLIMATE-RESILIENT EQUITABLE FOREST AND TREE CANOPY COVER**

# MIS-1: EQUITABLY TRANSITION TO A RESILIENT AND RENEWABLE ENERGY SYSTEM

## IMPLEMENTATION STRATEGY STATUS:

## UNDER DEVELOPMENT

# MIS-4: EQUITABLY TRANSITION TO ZERO EMISSIONS VEHICLES

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Reduce the number of gas-powered vehicles on the road and accelerate the equitable transition to Zero-Emissions Vehicles (ZEVs) Countywide by converting County-owned fleet and public transit to ZEVs (including EVs, which are a type of ZEV powered by electricity); converting school-buses to ZEVs; developing programs and policies that encourage private adoption of ZEVs by County residents and commercial fleets; and installing additional charging stations throughout the County.[1]

## WHY IT MATTERS

The transportation sector is the largest contributor of greenhouse gas (GHG) emissions in the United States, with on-road vehicles producing the majority of these emissions. In 2021, transportation accounted for 29% of total US GHG emissions.[2] In Prince George's County, transportation accounts for 48% of Countywide emissions and 23% of emissions associated with the County's operations.[3] Making transportation the largest source of GHG emission Countywide and the second largest source for the County's local government operations. Disadvantaged and highway-adjacent communities are disproportionately burdened with the impacts of tailpipe emissions and pollution from the transportation sector. ZEVs are one of the most promising tools to not only reduce GHG emissions but also improve the air quality and health of these communities.

Prince George's County has ambitious goals to reduce the emissions of its transportation sector by 50% by 2030. To support its goals, the County is committed to working with other public agencies to accelerate community-wide deployment of ZEVs, charging infrastructure, and ZEV public transit options. Overall, reducing the number of on-road fossil fuel-powered cars offers opportunities for cleaner air and improved public health, as well as bolstering the long-term well-being and climate resilience of communities.

## MAGNITUDE OF BENEFIT

The reduction of on-road gas-powered vehicles can help reduce GHG emissions from the transportation sector and lessen Prince George's County's fossil fuel consumption. Employing alternative fuels and vehicle hybridization may support the longer-term transition to ZEVs Countywide. ZEVs also provide compelling ancillary benefits, including the following:

- **Emissions Reduction**
  - ZEVs eliminate mobile source criteria pollutants and GHG emissions.
  - Light-duty battery electric vehicles reduce GHG emissions by over 72% compared to light-duty gasoline-powered vehicles.
- **Community health and quality of life**
  - ZEVs can reduce hazardous air pollutant emissions, improving air quality and reducing local negative health impacts of pollution.
  - Fossil fuel vehicles release pollutants, including nitrogen oxides, particulate matter, and volatile organic compounds. These pollutants worsen air quality, which can lead to health issues in communities.
  - By eliminating tailpipe emissions, EVs and ZEVs help maintain cleaner air quality in cities by reducing smog, respiratory illnesses, and heart conditions.
  - Investment in ZEV public transport options and related charging equipment can help communities to increase transit service levels and reduce wait and travel times, which can help make jobs more reachable.
- **Economic**
  - While EV purchase prices can be higher initially, the costs are ultimately offset by fuel cost savings, federal tax credits, and state and utility incentives.
  - EVs have significantly lower fuel costs compared to traditional vehicles. On average, energy costs are 50–75% lower than conventional vehicles.[4]
  - EVs have few maintenance costs as there is no need for oil changes or exhaust system repairs. The federal Clean Vehicle Credit provides a tax credit of $3,750 to $7,500 for eligible EV purchases, depending on factors like battery capacity and vehicle cost.[5]
- **Greenhouse gas emissions**
  - The total lifecycle GHG emissions of ZEVs (including production, operation, and disposal) are typically lower than those of gasoline cars.
  - Gas-powered cars produce nearly three times as many pounds of 'well-to-wheel' emissions compared to all-electric vehicles.

## MAGNITUDE OF COST

Table III–6. Magnitude of Cost

| Annual Cost Considerations | Planning costs (years 1-3) | Implementation costs (years 3 – goal end) |
|---|---|---|
| Existing staff/program | | |
| Program expansion | | TBD |
| New program and capacity needs | Y | |
| Current funding within the County budget? | N | |
| Private Sector Involvement | Y | |
| Capital* | | $$$ |
| Operations | | |
| » Salary and Benefits** | $ | $ |
| » Consultants | $ | |
| » Supplies and Materials | TBD | TBD |

**Assumes supplemental federal and/or state funding*
***Assumes salary and benefits are supplemental to broader energy program*

## STATE AND REGIONAL COMMITMENTS / GOALS

- Governor Wes Moore's initial down payment on addressing climate change included $17 million for grants for electric school buses and $23 million for grants to install electric vehicle charging infrastructure in low- and moderate-income communities.
- Prince George's County aims to have at least 15% of its approximately 620,000 vehicles (approximately 100,000) powered by electricity by 2030 (this aligns with the State of Maryland goal of having 600,000 Electric Vehicles (EVs) registered statewide by 2030).
- Maryland Senate Bill 528, the Climate Solutions Now Act of 2022, calls for all public schools to electrify their bus fleets through a statewide rebate program.
- The Maryland Department of Transportation established a goal for a 4% decrease in emissions between 2022 and 2023 as part of its Climate Pollution Reduction Plan.
    - As part of this plan, Maryland is taking advantage of federal funding and in many cases, matching those funds. For example, the Diesel Emissions Reduction Act provides federal funding for public agencies to switch diesel engines in transit systems to low carbon fuels.
    - Maryland is expanding EV charging with a goal of no more than 50 miles between charging stations along highways.

- Maryland is adopting California Air Resources Board (CARB) standards—all light duty vehicles and trucks on the market must be electric by 2035.
- Maryland has signed a multi-state Medium Heavy-Duty Emission Vehicles memorandum of understanding to transition to low carbon and electric vehicles.
- Maryland Department of the Environment (MDE) received funding for the Maryland Electric School Bus Fund, with approximately $3 million available in 2023/2024 to cover up to $300,000 for the cost of an electric school bus and infrastructure.
- MDE plans to reopen its VW Electric School Bus Program in 2024 with at least $4 million in funding.[6]
- Prince George's County Public Schools (PGCPS) published a Climate Change Action Plan (CCAP) in 2022 which outlines actions the PGCPS Board of Education plans to align itself with to achieve a carbon neural future, including committing to low carbon school transportation.
- The Governor of Maryland signed a Memorandum of Understanding with the Multi-State Zero Emissions Vehicle Action Plan (2021) that requires all school buses to be electric by 2045.
- The Metropolitan Washington Council of Governments 2030 Climate and Energy Action Plan establishes collaborative goals for area governments and partners to work on together to help move the region towards meeting its' 2030 climate mitigation and resiliency objectives, including expanding light-duty electric vehicle deployment and build out of regional electric vehicle charging networks.
- The US Department of Education's Climate Adaptation Plan September 2021aims to promote adaptation and resilience through the Department's programs and operations.
- The Aspen Institute's K12 Climate Action Plan (2021) aims to support the K-12 public education sector in becoming a force for climate action, solutions, and environmental justice to help prepare children and youth to advance a more sustainable, resilient, and equitable society.
- The Sierra Club's Climate Parents 100% Clean Energy School Districts Campaigns are working to transition school districts to 100% clean energy.

## EQUITY CONSIDERATIONS

- Traditional fossil fuel vehicles contribute to air pollution that negatively impacts health; however, lower-income residents and renters are less likely to be able to afford an EV or to have access to charging infrastructure.
- Prioritize the installation of EVSE for public use, with a focus on underserved communities in tandem with the following:
  - **Prioritize Public Transportation:** Prioritize The Bus fleet and collaborate with WMATA to advocate for the transition of regional buses to ZEVs to ensure equitable access to the benefits of the EV transition.
  - **Minimize the Emissions of County-owned Vehicles**: Convert all County-owned and operated vehicles to ZEV as quickly as possible to minimize the effect of emissions on residents.
  - **Incentivize Fleets to Convert to ZEV:** Many of the areas most utilized for the storage of commercial fleets vehicles, and the areas where those vehicles are used, are in areas with the most vulnerable populations. Develop programs to encourage the conversion of those vehicles to ZEV to minimize emissions impacts on the community.
  - **Evaluate Trade Offs:** When choosing between high-priority actions in a limited budget, prioritize the needs of vulnerable populations, and ensure work is completed in an equitable manner.
  - **Pilot Car Share:** Evaluate the feasibility of, and pilot, an EV or hybrid car voucher/discount program (subsidized by County) with ZIP or other related short-term car rental or car share programs in equity emphasis areas located near County installed EVSE. Support (via grants and partnerships) the purchase of EVs and installation of EVSEs as part of community-wide car share program in equity emphasis areas. Local advertisement of EV car share programs should be multilingual and leverage the trusted voices of the community.
  - **Ensure Equitable Distribution of Charging Stations:** Focus on ensuring those who cannot charge at home (renters, those with street parking, etc.) have a safe, accessible, affordable place to charge their vehicle, that is within a reasonable and safe walking distance of their home or office. Explore options that enable homeowners without a driveway to install curbside charging stations in front of their homes.

## PROGRESS FROM 2020 – 2024

### Planning Progress

The County Published the Prince George's County Government Operations: Electric Vehicle and Charging Infrastructure Action Plan in 2021.

The County engaged consultants through COG to develop a plan to prioritize EVCS deployment under various programs and incentives in 2023.

### Electric Vehicle Charging Station (EVCS) Progress

The County has exceeded the charging station deployment goals of the 2021 Prince George's County Government Operations: Electric Vehicle and Charging Infrastructure Action Plan.

The County and M-NCPPC have both partnered with electric utilities such as Pepco, BGE, and SMECO to address equitable access to electric vehicle charging infrastructure for its residents. This partnership has led to the installation of over 140 public-purpose EVCS on government properties (including municipals) throughout the County at locations such as park and recreational facilities, libraries, government office buildings, and Park and Rides.

Currently, approximately 58 electric vehicle charging ports or stations have been installed for government fleet usage per OCS.

In partnership with the electric utilities, Prince George's County Department of the Environment Sustainable Energy Program, the Office of Central Services, and M-NCPPC have installed or facilitated the deployment of the stations listed below.

Table III–7. Electrical Vehicle Charging Station installed by DoE

| Pepco EVCS Site Name | Location | LVL2 | DCFC |
|---|---|---|---|
| Ft Washington Park and Ride | 11901 West Livingston Rd, Upper Marlboro, MD 20772 | - | 2 |
| Largo-Kettering Library | 9601 Capital Ln, Largo, MD 20774 | 2 | 1 |
| Beltsville FSO | 11760 Baltimore Ave, Beltsville, MD 20705 | 4 | 1 |
| Largo - FSO (MVA) | 10251 Central Ave, Upper Marlboro, MD 20774 | 4 | 1 |
| Southern Regional Technology & Recreation Complex | 7011 Bock Rd, Fort Washington, MD 20744 | 4 | 1 |
| Bladensburg Street Parking | 4500 57th Ave, Bladensburg, MD 20710 | 3 | - |
| Berwyn Heights Police Dept | 5411 Berwyn Rd, Berwyn Heights, MD 20740 | 2 | - |
| Oakcrest Community Center | 1300 Capitol Heights Blvd, Capitol Heights, MD 20743 | 2 | - |
| Bladensburg Town Hall Parking Lot | 4229 Edmonston Rd, Bladensburg, MD 20710 | 2 | - |
| Brentwood Police Department | 4300 39th Pl, Brentwood, MD 20722 | 2 | - |
| Sasscer Admin Bldg. VCS | 14201 School Ln, Upper Marlboro, MD 20772 | 4 | - |
| Tanglewood Regional School | 8333 Woodyard Rd, Clinton, MD 20735 | 4 | - |
| Palmer Park Community Center | 7720 Barlowe Rd, Hyattsville, MD 20785 | 4 | - |
| Town Hall Seat Pleasant | 6301 Addison Rd, Capitol Heights, MD 20743 | 3 | - |
| Acredale Community Park | 4200 Metzerott Rd College Park, MD 20740 | 4 | - |
| Cherry Hill Community Park | 4620 Cherry Hill Rd College Park, MD 20740 | 4 | - |
| Hillcrest Heights Community Center | 2300 Oxon Run Dr Temple Hills, MD 20748 | 4 | - |
| Town of Fairmount Heights | 6005 J St, Capitol Heights, MD 20743 | 2 | - |
| Kentland Community Center | 2413 Pinebrook Ave, Hyattsville, MD 20785 | 4 | - |
| Peppermill Village Community Center | 610 Hill Rd, Hyattsville, MD 20785 | 4 | - |
| North Barnaby Splash Park | 5000 Wheeler Rd, Hillcrest Heights, MD 20748 | 2 | - |
| Prince George's Plaza Community Center | 6600 Adelphi Rd, Hyattsville, MD 20782 | 2 | - |

Table III–7. Electrical Vehicle Charging Station installed by DoE

| Pepco EVCS Site Name | Location | LVL2 | DCFC |
|---|---|---|---|
| Lake Arbor Community Center | 10100 Lake Arbor Way, Bowie, MD 20721 | 4 | - |
| Tanglewood Park | 8339 Woodyard Rd, Clinton, MD 20735 | 2 | - |
| Harmony Hall Regional Center | 10701 Livingston Rd, Fort Washington, MD 20744 | 4 | - |
| Langley Park Community Center | 8201 15th Ave, Hyattsville, MD 20783 | 2 | - |
| PGCC Lot J | 301 Largo Rd, Largo, MD 20774 | 4 | - |
| PGCC Lot I | 301 Largo Rd, Largo, MD 20774 | 4 | - |
| Public Library- Spaulding | 5811 Old Silver Hill Rd, District Heights, MD 20747 | 4 | - |
| Department of Housing 9200 Basil Court | 9200 Basil Ct, Upper Marlboro, MD 20774 | 4 | - |
| North Brentwood Municipal Center | 4012 Webster St, North Brentwood, MD 20722 | 2 | - |
| Forest Heights Community Park | 5433 Sachem Dr, Forest Heights, Maryland 20745 | - | 1 |
| Colmar Manor Town Lot (SITE TWO) KFC Lot | 3613 40th Pl, Colmar Manor, MD 20722 | 4 | - |
| Colmar Manor Town Lot | 3603 40th Ave, Colmar Manor, MD 20722 | 2 | - |
| Clinton Park and Ride | 9000 Stuart Ln, Clinton, MD 20735 | - | 1 |
| Town of Riverdale Park Town Center | 6200 Rhode Island Ave, Riverdale Park, MD 20737 | 2 | - |
| Davis Hall DPW | 9217 51st Ave, College Park, MD 20740 | 1 | - |
| Capitol Heights Municipal Parking | 6053 Central Ave, Capitol Heights, MD 20743 | 3 | - |
| Forest Heights Police and Community Center | 5508 Arapahoe Dr, Oxon Hill, MD 20745 | 2 | - |
| Oxon Hill Park and Ride | 6600 Oxon Hill Rd, Oxon Hill, MD 20745 | 2 | - |
| Springhill Lake Recreational Center | 6101 Cherrywood Ln, Greenbelt, MD 20770 | 1 | - |
| Schrom Hills Recreational Center | 6925 Hanover Pkwy, Greenbelt, MD 20770 | 4 | - |
| Prince George's County Equestrian Center | 14900 Pennsylvania Ave, Upper Marlboro, MD 20772 | 4 | - |
| 35th Street | Perry St Mount Rainier, MD 20712 | 3 | - |
| Andrew Hanko Building | 8511 Legation Rd, New Carrollton, MD 20784 | 3 | - |
| **SMECO EVCS Site Name** | **Location** | **LVL2** | **DCFC** |
| Accokeek Branch Library | 15773 Livingston Road, Accokeek, MD 20607 | 2 | - |
| **BGE EVCS Site Name** | **Location** | **LVL2** | **DCFC** |
| Bowie Park and Ride | Installation in Progress | | |

*Data Source: Pepco, SMECO, BGE as of March 2024*

**Fleet ZEV Adoption Progress**
Total light vehicle fleet size[Z] – 1,200
Zero Emission Battery Electric Vehicles – 15
Plug-In Hybrid Electric Vehicles – 51
Hybrid Electric Vehicles – 273

**Transit ZEV Adoption Progress**
12 full size ZEV transit buses currently deployed
5 additional zero emission buses on order, with funding for 21 additional zero emission buses
Funding secured for additional infrastructure to support transit bus charging infrastructure
2 EV Paratransit Ford E-Transit vans deployed in paratransit service

## KEY PERFOMANCE METRICS

- Number of Electric Transit Buses (full-size)/Total Number of Buses (DPW&T)
- Number of Electric "Ride-On" buses/ Total number of Ride-on Buses (DPW&T)
- Number of Electric Fleet Light-Duty Vehicles/ Total Number of Fleet Light-Duty Vehicles (DPW&T)
- Number of ZEV Heavy Duty Vehicles/ Total Number of Heavy Duty Vehicles
- Number of ZEV County-Owned Specialty Equipment/ Total number of Specialty Equipment
- Number of Publicly Operated Charging Stations
- Number of level 2 and DC fast chargers located in the County
- Charging station utilization rate
- Downtime rate of stations Revenue generation for government-owned or operated stations
- CO2 reductions for vehicles and charging infrastructure.
- Number of electric vehicles including plug-in registered in the County
- Number of permits issued for electric vehicle charging stations

## 2025 GOALS / ACTIONS

The CEX's FY2025 budget includes over $20,000,000 in funds (a significant portion of which are grant funds secured by DPW&T) to replace buses and fleet vehicles, improve EV infrastructure, hire an electrician with specific expertise to maintain EV charging stations, convert existing vehicles to bio-diesel as a transition strategy, support and improve bicycle infrastructure and capital bike share, and a variety of other transportation initiatives.

The CEX budget supports planning efforts of $1,405,000 to complete the underlying studies and pilot programs across the strategies, as well as build a Climate Reporting Dashboard and support public engagement (detailed in other strategies).

The CEX budget supports up to $912,500 in grant matching funds through the Department of Environment that could leverage up to $200,000,000 in federal funds to support climate action planning and implementation including zero emissions in transportation and infrastructure.

# PRIORITY TASKS

## Task 1 Develop an EV deployment strategy that addresses both the County fleet transition and community-wide EV adoption.

The County should develop an updated Prince George's County EV deployment strategy, growing off the sucesses of the 2021 Prince George's County Government Operations: Electric Vehicle and Charging Infrastructure Action Plan (*2021 EVPlan*).

- The County has exceeded the charging deployment goals of the *2021 EVPlan*.
- The County continues the transition of public transit to ZEVs
- The County has only made minor progress towards the goal of deployment of 100,000 EVs throughout the County by 2030.

*Per the* Maryland MDOT/MVA*, Electric and Plug-In Hybrid Vehicle Registration as of December 2023:*

Table III–8. Electric and Plug-In Hybrid Vehicle Registration

| | Electric Vehicles | Plug-In Hybrid |
|---|---|---|
| State of Maryland | 64,586 | 28,135 |
| Prince George's County | 8,274 | 3,018 |

Lessons learned, case studies, programs, policies, and outreach efforts from other regions that have successfully piloted EV programs will support the development of this strategy. To identify where to prioritize EVSE installations, the County should perform a GIS analysis of public charging stations needs by census tract over the next 5, 10, and 30 years, along with an analysis of County-owned facilities where EVSE installation will have the greatest impact. These studies should be coupled with a careful examination of bus routes that travel through low-income and underserved communities to identify priority areas for the EVSE transition.

The EV deployment plan should summarize code revisions and other materials needed to support permitting. It should also include a myriad of recommendations linked to the following:

1. Adoption and installation targets.
2. Opportunities for policy revisions, collaborations, multimodal transit solutions, and workforce development.
3. EV infrastructure service models and best practices.
4. Maintenance schedules and procedures for charging stations.

To ensure that the adopted measures are grounded in the needs and concerns of interested parties, the development of this strategy should involve significant stakeholder engagement from both County residents and transportation service companies. In that spirit, the organization of meetings with community members will help spread information and incentives and establish a clear set of goals.

## Task 1 (Continued)

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|---|---|
| **Responsible Lead Entity** | OCS, DPW&T, DoE |
| **Secondary/Partners** | DPIE, Utilities |

## Task 2 Establish a baseline by which goals and targets can and will be tracked.

Based on the recommendations provided in the EV deployment strategy, clearly establish a baseline and a related set of goals and targets through which implementation can be tracked. Measure and report on the progress made toward achieving these goals across departments and agencies.

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| **Responsible Lead Entity** | OCS |

## Task 3 Prioritize transitioning public transit to ZEVS.

The County should transition the bus system to ensure it meets the local transportation needs while minimizing environmental impacts. Through coordination with WMATA, DPW&T, and MetroAccess, the County could support prioritization of ZEVs on bus routes that travel through low-income and underserved communities. Additionally, the County should collaborate with and/or urge paratransit organizations (Call-a-Bus, Call-a-Cab, MetroAccess, and Senior Transportation Services) to electrify their fleets and fueling infrastructure.

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| **Responsible Lead Entity** | DPW&T |
| **Secondary/Partners** | RTA, WMATA, Paratransit systems |

## Task 4 Continue to increase EVSE installations through utility pilot programs and other partnerships.

Continue installing EVSE through utility pilot programs, federal funding opportunities, and partnerships with transportation network companies. Installation efforts should be coordinated across the County and partner organizations (e.g., the County, PGCPS, MNPPC, privately-owned fleets). Additionally, the usage requirements for County-owned facilities as opposed to stations for public usage should be clarified. Once an EV deployment strategy is developed, the EVSE installations should be aligned with recommended priorities (for example, electric utility programs that promote EV charging stations) and goals from existing plans. Promotion of the EV deployment strategy should be promoted to local businesses to inform their EV strategy development plans as well.

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| **Responsible Lead Entity** | OCS |
| **Secondary/Partners** | County, PGCPS, M-NCPPC, others |

## Task 5 Revise Prince George's County code of ordinance, standards, policies, and processes to support ZEV deployment.

Evaluate and adopt strategies to accelerate EV deployment. Consider amending parking ordinances to specify the regulations that apply to parking spaces designated for EVs. Applicable definitions, enforcement policies, time limits, and fees should be specified, as well as the minimum dimensions for EVSE parking spaces compliant with the County code and the Americans with Disabilities Act (ADA). Additionally, the County code should be reviewed and revised as appropriate to incorporate development standards for EVSE and EV parking. On the one hand, EVSE signage requirements should be added, including those for wayfinding signage, parking restrictions that prevent internal combustion engines (ICE) from using PEV-dedicated parking spaces, guidance on EVSE use, and penalties for regulation violations. On the other hand, revisions will be necessary on procurement policies, permitting processes, solicitations for implementing renewable energy projects on County-owned properties, CIP process to prioritize renewable energy implementation, and ordinances or policies that restrict residents' ability to site renewable energy generation and storage on their property. It will be crucial to clarify the existing DPIE and DPW&T process and standards on which to build, as well as any gaps in DPIE's guidance. Departments in charge of zoning should be responsible for establishing parking-related stations on private property.

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| **Responsible Lead Entity** | M-NCPPC Planning Department, DPW&T, DPIE |

## Task 6 Expand community education and outreach on zero emissions vehicles.

Develop educational materials and conduct community outreach, including targeted outreach to commercial and multi-family property owners. To do so, it is crucial to ensure that education starts in communities initially identified through Environmental Justice (EJ) screening tools, for addressing community concerns and misconceptions related to EV performance will be crucial to improving uptake. Similarly, community education should heavily focus on available incentives and benefits linked to the purchase of EVs and anticipate the longer-term reduction or disappearance of such incentives. Beyond ensuring that communication objectives are tailored to address the concerns of these communities, the strategy should actively ensure that they are reached. This can be done through regular listening and information-sharing sessions.

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|---|---|
| **Responsible Lead Entity** | DoE/DPW&T |
| **Secondary/Partners** | County Council |
| **Special Considerations** | The County should leverage recognized EV programs and resources such as the Joint Office of Energy and Transportation's driveelectric.gov website, U.S. Department of Energy's Alternative Fuels Data Center, and Pepco's EVsmart Program which can provide best practices and technical assistance with regards to revising policies and process to expand the adoption of ZEV use. |

## Task 7 Electrify Prince George's County Public Schools' fleet, including light-duty vehicles, school buses, and other mobile equipment by 2040, and private school bus fleets.

Transportation is a key element of school systems, and school buses are the primary source of emissions from PGCPS transportation activities. PGCPS also operates a fleet of maintenance vehicles and other off-road sources of GHG and air pollution emissions, such as lawn mowers, that should be incorporated into PGCPS's electrification 2040 goals. Private schools with bus and vehicle fleets contribute to the County's GHG emissions as well as and should be included in fleet electrification transition efforts. The three primary areas to address are:

1. **Electrify the school buses and the light-duty vehicles fleets** that are maintained by PGCPS for use by staff for work-related purposes. Private schools will be required to use electric school buses by the 2040 timeline.
2. **Electrify equipment used for grounds maintenance.** 2-stroke engines in particular produce high levels of air pollution, GHG emissions, and noise. Full-scale replacement is not yet feasible based on current market offerings; however, the County should adopt an 'electrify-first' purchasing stance to evaluate and select suitable electric replacements to ensure that it takes advantage of the increasing number of options becoming available.
3. Design facilities to allow space for charging infrastructure to be added as needed, otherwise known as **designing to be electric vehicle ready** (EV ready).

| | |
|---|---|
| **Responsible Lead Entity** | PGCPS |
| **Secondary/Partners** | DPW&T, DoE |
| **Special Considerations** | The County should leverage recognized programs and resources. 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. **MDE's "clean" school bus 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. |

## Task 8 Assess opportunities for the adoption of multimodal transit solutions such as increasing mass transit, EV car sharing, and electric shared bikes.

Effective public transportation requires the integration of multiple types of travel modes from public transit options that can cover long distances to micromobility for that 'last mile' of travel to/from someone's destination.

The County should support existing and future programs for mass transit, car sharing, and electrified micromobility by promoting the air quality, human health impacts, and environmental justice benefits through a multilingual advertising campaign and work with community partners to disseminate information about the programs.

» These different forms of travel can be leveraged as a multimodal network to offer effective and useful alternatives to single occupancy, privately owned vehicle travel.

» To increase use of mass transit, the County can pursue a transit vision study to assess

**Task 8 (Continued)**

pathways to increased ridership. Through recruitment and partnership with short-term car share and e-bike share programs, the County should seek to increase the use and availability of EVs, hybrid vehicles, and e-bikes Countywide and the availability of these rentals in equity emphasis and underserved areas.

» The County could pursue these outcomes through a contract and licensing program with short-term car share and e-bike companies, which could include requirements for minimum numbers and distribution of EVs, hybrid vehicles, and e-bikes across the County, incentivizing driver selection of EVs and hybrids with a point-of-sale voucher/discount program, and installing charging equipment in areas identified as prime locations for the car sharing vehicles and e-bikes to be parked.

» To support availability of these programs in proximity to low-income housing, the County should work with housing partners and community-based organizations or non-profits such as those in the U.S. Department of Energy Clean Cities and Communities Network to provide technical support and seek out incentives. The County can explore with car share program operators opportunities to recondition and integrate EVs and hybrid vehicles from the County's fleet into the car share program.

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| **Responsible Lead Entity** | DPW&T |
| **Secondary/Partners** | DoE, DPIE, Utilities |

## THEBUS AND HEAVY VEHICLES GO ELECTRIC

To reduce greenhouse gas emissions, the Department of Public Works and Transportation is modernizing TheBus fleet by replacing old diesel buses with battery electric buses and/or other energy-efficient alternative fueled vehicles. In 2021, DPW&T plans to install four electric charging stations and purchase four battery electric buses that emit no greenhouse gases. Each time a diesel bus is replaced by a zero-emission electric bus, CO2 emissions are reduced by approximately 229,167 pounds annually[8]. This means that over the 12-year life of a typical transit bus, replacing a single diesel bus with a battery electric bus can save over 2.5 million pounds of carbon emissions. Additionally, the Maryland Volkswagen Mitigation Plan awarded DPW&T funding to replace six diesel trucks with electric trucks. This switch to zero-emission vehicles cuts pollution, creates healthier communities, and brings the County closer to achieving its greenhouse gas reduction targets.


### LED Street Lighting Upgrades

A reduction in energy consumption and an increase in energy efficiency are required in all sectors of the economy for the County to achieve its sustainability goals. DPW&T is committed to making the County transportation network energy efficient by replacing high pressure sodium (HPS) street lights with more efficient light emitting diode (LED) lights. Already, DPW&T has upgraded 6,026 lights to LED and an additional 3,891 lights will be upgraded in summer 2021. By working with utility companies, DPW&T aims to implement the LED street light conversion program across the County, thereby contributing to a healthier environment and reducing the long-term financial impact of inefficient lighting.

10


# MIS-6: ADOPT INTERNAL POLICIES TO ENHANCE RESILIENCE AND REDUCE VMTS OF COUNTY EMPLOYEES

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Reduce County employee Vehicle Miles Traveled (VMT) to reduce transportation carbon emissions and enhance County resiliency.

## WHY IT MATTERS

Prince George's County has a goal to reduce its carbon emissions by 50% by 2030 compared to 2005 levels, with the ultimate goal of achieving carbon neutrality by 2050. Vehicle Miles Traveled (VMT), which are defined as the total annual miles of vehicle travel divided by the total population in an urbanized area (U.S. DoT), are correlated with the County's carbon emissions and thus play an important part in the County's carbon reduction goals. In addition to carbon reduction benefits, reducing VMT can offer opportunities to improve the accessibility of communities, particularly marginalized communities that may be disproportionately affected by traffic congestion, pollution, or limited mobility options.

Administrative Procedure 226 establishes guidelines for implementing and operating the County government's Telework Arrangement Program (TAP), which will help to decrease VMT among commuting employees. More broadly, smart growth patterns, such as designing communities such that essential services and workplaces are easily accessed via walking, biking, or by public transportation, are also a highly effective way to decrease VMT. Communities with diverse and easily accessible transportation options, including buses, bike lanes, and pedestrian-friendly streets, become more accessible to people of all ages, abilities, and income levels.

## MAGNITUDE OF BENEFIT

Goals to reduce VMT in Prince George's County can result in reduced vehicle emissions and the development of more walkable and bike-friendly communities, which can lead to benefits including increased community well-being and health.

Encouraging telework opportunities is one way the County is focusing on reducing VMT. Telework can reduce commuting times and traffic in communities. Telework can also help to foster a better work–life balance among employees, which increases well-being. This may also increase equity among employees, as they will be able to save time and money by reducing their workday commutes, which may place additional burdens on some individuals. Telework can also provide additional economic benefits by increasing worker productivity and reducing operational costs.[8] Prince George's County government's VMT policy may also set an example to encourage other businesses and industries to consider adopting a similar VMT policy, potentially leading to additional emission reductions and economic benefits. When viewed in total, County residents participating in a VMT program could help drive a new local marketplace to support the County's focus of building activity centers that are mixed-use developments with easy access to necessary services and transportation. Residents will spend less time on the road, more time at home, and potentially become steady patrons of local businesses at a nearby activity center, leading to increased community benefits while decreasing carbon emissions.

## MAGNITUDE OF COST

Table III–9. Magnitude of Cost

| Annual Cost Considerations | Planning costs (years 1-3) | Implementation costs (years 3 – goal end) |
|---|---|---|
| Existing staff/program* | | |
| Program expansion | | TBD |
| New program and capacity needs | Y | |
| Current funding within the County budget? | N | |
| Private Sector Involvement | Y | |
| Capital** | | $$$ |
| Operations | | |
| » Salary and Benefits | $ | $ |
| » Consultants | $ | |
| » Supplies and Materials** | TBD | TBD |

**Assumes current staff and salary funding can complete planning and implementation.*
***Assumes minor capital/material for computers and home office reimbursements. This may not be a new budget item and may be a reallocation of existing funds.*

## STATE AND REGIONAL COMMITMENTS / GOALS

- The Greenhouse Gas Emissions Reduction Act-Reauthorization (GGRA of 2016) set forth a goal to achieve a 40% reduction in statewide greenhouse gas emissions by 2030. The Act also required the Maryland Department of the Environment (MDE) to develop a statewide plan (2030 GGRA Plan) to achieve this goal.
- The Maryland Department of Transportation established a goal for a 4% decrease in emissions between 2022 and 2023 as part of its Climate Pollution Reduction Plan
    - As part of this plan, Maryland is taking advantage of federal funding, and, in many cases, matching those funds. For example, the Diesel Emissions Reduction Act provides federal funding for public agencies to switch diesel engines in transit systems to low carbon fuels.
    - Maryland is expanding electric vehicle (EV) charging with a goal of no more than 50 miles between charging stations along highways.
    - Maryland is adopting CARB standards—all light duty vehicles and trucks on the market must be electric by 2035.
- Maryland's Statewide Transit Plan (2023) outlines the state's transit strategy and goals to increase the geographic range and frequency of service over the next 50 years with an emphasis on sustainability.
- In 2019, Maryland began subsidizing transit for certain permanent State government employees.
- The Maryland Climate Pathway Report that informed the initial plan for the state's Climate Solutions Now Act (CSNA) implementation mentioned VMT reduction as a primary transportation sector decarbonization strategy.
- The Transportation Planning Board's Climate Change Mitigation Study found that the DC-Metro area needs to achieve light-duty VMT reductions 15–20% below the current transportation plan's forecast.
- Prince George's County Plan 2035 identifies a reduction in the per-capita vehicle miles traveled as an indicator of success

## EQUITY CONSIDERATIONS

- Offer technical and/or financial incentives to employees with disabilities or other medical needs to optimize their work from home space.
- Offer AWS as an option for job types that are not eligible for participation in the TAP. An alternative work schedule will allow employees to meet work requirements and bi-weekly eighty (80) hour requirements via compressed or flexible schedule plans.
- Provide reasonable accommodations, such as necessary equipment, to ensure that any employee who is eligible and interested in working from home has a safe and functioning workspace.
- Consider how requiring telework can increase the financial burden on employees; ensure that any telework policy is flexible and does not provide undue hardship.

## PROGRESS FROM 2020 – 2024

Since the COVID emergency sent staff home in March 2020, the County has made significant strides in creating a digital environment that supports minimizing VMT (and minimizing waste - another significant source of GHG) while delivering improved services.

The County has been awarded first place in the national "Digital Counties Survey" in its population category (500,000 to 999,000) in 2021, 2022 and 2023, demonstrating our continued commitment to improving services through technology.

The County Council also finalized its move to the Wayne K. Curry Administration building in Largo, consolidating the Council and Executive branch functions to a transit-accessible building and further reducing VMT and following guidance and recommendations in plan 2035.

### KEY PERFORMANCE METRICS

Metrics will be developed as part of the tasks below

### 2025 GOALS / ACTIONS

The CEX budget continues to support the tools and policies to for a hybrid work environment that prioritizes service delivery while also permitting flexibility for some workers to work from alternative workspaces (generally home) to reduce VMT where productivity is increased or not affected.

## PRIORITY TASKS

### Task 1 Conduct an employee commute survey and establish baseline vehicle miles traveled (VMT) among commuters and fleet users.

Gather data to quantify and establish baseline VMT among commuters and fleet users; existing participation in telework and Alternative Work Schedules program; and usage of alternative parking arrangements for fleet vehicles to identify areas for improvement and to track reductions in VMT. Include data on usage of mass transit, carpools, etc. Clarify where opportunities exist to reduce VMT among County employees.

Conduct an employee commute survey. Include questions to assess commuter preferences and behavior, amenities that workers may drive to during the day, quality of work days if teleworking, and home energy consumption and efficiency rates. Potentially include questions about use of mass transit or other single-occupancy vehicle (SOV) alternatives. Identify barriers to participation in VMT reduction actions like telework or alternative work schedules for eligible employees (e.g. childcare, internet, etc). Inquire about interest in home energy efficiency programs and provide information on available support for reducing home energy usage.

Items to measure and track include:

- County employee VMT
- % County employees who telework vs. % County employees eligible to participate
- Employee satisfaction with telework and related policies
- Estimate potential net emissions reductions associated with reductions in VMT

| | |
|---|---|
| **Responsible Lead Entity** | OHRM, OCS |
| **Secondary/Partners** | County Agencies |

## Task 2 Expand participation in VMT reduction strategies for commuters and fleet users.

Based on results of survey and data gathering in *Task 1*, clarify remaining steps and proceed with implementation to expand participation in VMT reduction strategies. These steps will likely include:

- Promote and if appropriate incentivize participation in VMT reduction programs including TAP and AWS, alternative parking arrangements for fleet vehicles, mass transit, carpools, etc.
- Develop and market informational material to raise awareness of available programs and to show employees how their actions can help the County reach its emission reduction goals.

Address barriers to participation in VMT reduction programs. These steps may include:

- Provide additional technical support for home offices.
- Conduct capacity building training and professional development for supervisors of remote workers to enhance team cohesion in a remote work environment.
- Expand alternative parking options for fleet vehicles.

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| **Responsible Lead Entity** | OHRM |
| **Secondary/Partners** | County Agencies |

## Task 3 Reduce the carbon impacts of employee travel.

Encourage maximum participation virtually for County training, information sessions, lunch and learns, meetings, etc. by making meetings accessible via teleconference, video streaming, and other electronic media formats.

Evaluate and recommend a process to account for how CO2 emissions reductions can be quantified and taken into consideration when developing departmental travel plans (also specify which scope(s)).

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| **Responsible Lead Entity** | OHRM |
| **Secondary/Partners** | OIT/ County Agencies |
| **Special Considerations** | Consider encouraging offsets (i.e., purchase of carbon credits) for the travel footprints of County agencies. |

# MIS-8: ACCELERATE IMPLEMENTATION OF DEEP ENERGY RETROFITS AND COMMUNITY-WIDE EFFICIENCY AND WEATHERIZATION EFFORTS

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Implement deep energy retrofits in County buildings and develop programs and policies that accelerate community-wide implementation of deep energy retrofits on private properties, including energy efficiency and weatherization efforts.

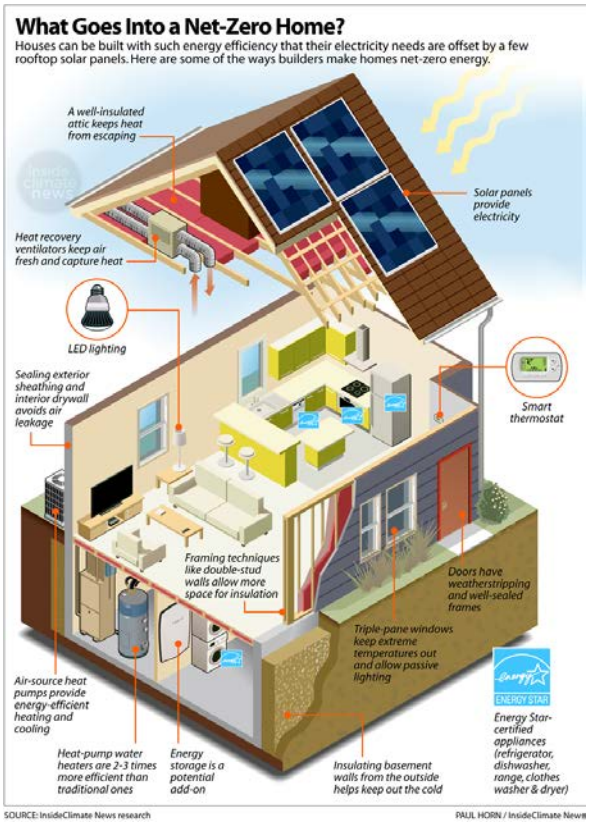
Note: This Strategy focuses exclusively on residential properties owned by public and private entities. MIS-9 focuses more broadly on commercial buildings used for commercial activities and County-owned/operated buildings. There is some inevitable overlap.

## WHY IT MATTERS

Prince George's County is committed to reducing energy consumption to levels that will enable the County to achieve its goal of 50% reduction in greenhouse gases by 2030. The use of energy to heat, cool, light, and power equipment and devices in commercial and residential buildings is the second largest source of GHG emissions in the County. By increasing energy efficiency community-wide, especially in the form of deep energy retrofits, the County can reduce energy costs, improve air quality, and move closer to achieving its energy consumption and GHG emissions reduction goals. Accelerating deep energy retrofits, a comprehensive approach to improving a building's energy efficiency that leads to 50% or more energy savings as compared to pre-retrofitted conditions, also supports equity efforts as there is an emphasis on ensuring that these retrofits occur across the County, including in disadvantaged communities. These retrofits will also make buildings more resilient to extreme climate impacts, thus increasing the overall resilience of the County.

## MAGNITUDE OF BENEFIT

Increasing energy efficiency has a broad range of benefits since it both mitigates the cause of climate change by reducing carbon emissions and increases resilience by updating and retrofitting buildings. Prince George's County has already begun to implement innovative building designs, appliances, and energy efficiency upgrades, all of which will help achieve its energy reduction goal. The County has also already established ongoing programs that focus on weatherization and installation of energy efficient lights and appliances in both commercial and residential buildings, ensuring community members will experience the benefits.




The County's energy reduction goal is focused on equity, ensuring that retrofits are carried out for all individuals and across socioeconomically diverse areas. These retrofits can help older buildings better sustain climate hazards, such as extreme heat and cold, better protecting residents from these impacts. Building improvements can help homeowners remain comfortable in their homes and reduce the need for temporary heating or cooling shelters on extreme weather days, lessening the burden on community resources.

The reduction in GHG emissions that comes from decreased energy demand through energy efficiency will also help mitigate climate change impacts. In buildings, energy efficiency may include measures such as using LED lighting, improving building insulation, optimizing natural ventilation, retrofitting heating and cooling systems, or through use of daylighting.

Enhancing energy efficiency not only benefits individual households but also plays a crucial role in reducing strain on the electricity grid. At the grid level, enhancing energy efficiency may involve grid modernization measures such as use of tamper proof meters, upgraded efficiency transformers, or employing distribution automation with advanced sensors and controls and software. Energy efficiency to reduce GHG emissions can also be targeted by enhancing energy efficiency at public utilities such as for water treatment (pumping of water and aeration of tanks), management, and distribution plants.

Energy efficiency improvements also offer a wide range of economic benefits including cost savings for businesses and households and new job opportunities for individuals to audit, design, and construct energy projects and improvements. Low-income households, Black households, Native American households, Hispanic households, older adults, and renters all face disproportionately high energy burdens (the amount of their income spent on energy bills). According to recent estimates, 67% of low-income households face a high energy burden (above 6%). A quarter of all households in the country face a high energy burden. Energy efficiency upgrades such as weatherization (adding insulation and sealing air leaks) can reduce energy burdens by about 25%, making weatherization an important strategy for reducing energy burdens as well as energy use. An analysis by the American Council for an Energy-Efficient Economy (ACEEE) estimated that having a requirement for new homes purchased with federally backed loans/mortgages to meet the latest building energy codes could provide $5,700 in lifetime net savings for the average household and $27 billion in total net savings through 2050.[9]

Beyond immediate savings, improved energy efficiency sets the stage for broader energy enhancements. This includes integrating strategies like solar photovoltaics, electric vehicle chargers, and battery storage systems. By combining these approaches, households not only reduce their environmental footprint but also contribute to building a more resilient and sustainable energy landscape.

## MAGNITUDE OF COST

Table III–10. Magnitude of Cost

| Annual Cost Considerations | Planning costs Task 1 (years 1 – 3) | Implementation costs (years 3 – goal end) |
|---|---|---|
| Existing staff/program | 2 | Y |
| Program expansion | | TBD |
| New program and capacity needs | | TBD |
| Current funding within the County budget? | Y | |
| Private Sector Involvement | Y | |
| Capital* | | $$$ |
| Operations | | |
| » Salary and Benefits | | $$ |
| » Consultants | | $$ |
| » Supplies and Materials | | $$ |

**Assumes federal and state support.*

## STATE AND REGIONAL COMMITMENTS / GOALS

- The Climate Solutions Now Act of 2022 requires the State to reduce statewide greenhouse gas emissions by updating the reduction goal to 60% by 2031, setting a new net-zero greenhouse gas emissions goal for the economy by 2045, and implementing other projects and programs. To improve energy efficiency in buildings, the Act requires the Maryland Department of the Environment (MDE) to develop building energy performance standards (BEPS) in buildings 35,000 square feet or larger. These "covered buildings" will be required to report their emissions and engage in emissions reductions measures or face fines. Existing buildings may qualify for funded retrofits to improve energy efficiency. Most new buildings will be required to use entirely electric systems.
- SB0524/HB0108 requires the Department of Housing and Community Development to provide funding for energy efficiency programs to achieve 1% annual savings for low-income households by 2026.
- HB6 2023 required the Department of General Services to establish and update standards for State buildings to conserve energy.
- Maryland is expanding the EmPOWER Limited-Income Programs from 2024–2026 and will administer $335 million in energy efficiency funds.
- The Maryland Department of Energy has committed to a 50% GHG reduction over 10 years, including a 20% reduction in energy intensity as part of its Better Climate Challenge. It will accomplish this through building performance standards that increase with stringency over time.
- The Maryland Department of Housing and Community Development offers various funding opportunities, generally aimed at low-income households, to improve energy efficiency through improved insulation and weatherization assistance. It also administers a BeSMART home loan program to offer loans for upgrading appliances, heating, ventilation, and cooling systems. Some of this funding is offered in partnership with utilities (the Low-Income Energy Efficiency Program).
- As a member of the U.S. Climate Alliance, Governor Wes Moore committed to delivering 4 million heat pumps to Maryland by 2030.
- Maryland asserted its commitment to energy efficiency by joining the White House National Building Performance Standards Coalition in

the Summer of 2023. The State's Office of People's Counsel (OPC) and the Maryland Building Energy Transition Implementation Task Force both issued reports ahead of the state's reconsideration of the Strategic Infrastructure Development and Enhancement Plan (STRIDE), its program for replacing gas infrastructure, that recommended the program be replaced by increased efforts and investment in building electrification. SB548/HB731 — STRIDE-related bills being considered by the General Assembly reform the program with building electrification, decarbonization, and efficiency in mind.

- Maryland's 2023 Climate Pathway Report and Climate Pollution Reduction Plan, which guide Climate Solutions Now Act implementation, emphasize climate and energy job growth as a priority. Energy efficiency measures and building electrification are strategies to enhance workforce development goals outlined in these plans. Expanding efficiency workforce development programs is also a priority strategy recommended by the Maryland Building Energy Transition Implementation Task Force.
- The plan also states that "Maryland's 23 counties are responsible for the adoption of new building energy codes and related operational impacts", with the goal of improving building efficiency and decarbonization.
- Maryland's Greenhouse Gas Reduction Plan recommends that the state improve its efforts to transition appliances to clean-powered and efficient alternatives.
- MDE is in the process of developing its final zero emissions appliance plans.
- Baltimore Gas and Electric (BGE) Integrated Decarbonization Strategy—their multi-year capacity expansion plan—requires efficiency beyond Maryland's current targets and encourages additional funding and coordination for energy efficiency programs.

## EQUITY CONSIDERATIONS

- Incentivize, subsidize, or provide grant funding for the implementation of deep energy retrofits in vulnerable communities.
- Low-income residents may require additional programs and direct funding to address barriers to implementing deep energy retrofits and weatherization projects (I.e. residents may need costly roof repairs before they can install solar panels).
- Cost may not be the only barrier preventing homeowners from implementing deep energy retrofits and weatherization efforts. Identifying qualified contractors and onerous permitting processes and paperwork may also reduce participation. Where possible, simplify these processes and develop technical assistance programs to support homeowners. Ensure information is available in multiple languages based on community demographics.
- Renters often directly pay for utilities, but do not have the ability to perform deep energy retrofits or weatherization projects to reduce their energy costs. Landlords may pass any upgrades they perform on to renters, limiting the financial benefit of performing these upgrades. Develop incentive programs for rental buildings that are designed to limit costs being passed on to tenants.

## PROGRESS FROM 2020 – 2024

### CLEAN ENERGY PROGRAM

The Clean Energy Program, Energy Efficiency Grant joins ongoing efforts and programs created by the County to uplift neighborhoods that face economic and health challenges. The grant, coupled with EmPOWER Maryland energy incentives, assists residents with implementing energy-efficiency measures in nine designated neighborhoods, classified as Energy Resiliency Communities (ERCs).

The overarching goal of the ERC designation is to help communities anticipate, prepare for, and adapt to changing conditions and recover from energy disruptions. The ERCs evolved from a County initiative, formerly known as the Transforming Neighborhoods Initiative (TNI), which utilized several metric indicators such as education, public safety, and employment to identify key neighborhoods across the County needing holistic uplifting.

As of February 2024, Sustainable Energy has processed over 2,000 energy efficiency grant applications. Due to the success of the grant, the agency is in the last round of funding for this aspect of the program.

### GREEN ENERGY LOAN PROGRAM

FSC First serves as the Green Energy Loan administrator and provides loans to participating lenders to compel them to provide financing for sustainable energy projects. Eligible projects include but are not limited to energy and water efficiency in buildings, microgrids, solar including community solar projects, resiliency measures, and clean transportation such as electric vehicle charging infrastructure. As of the date of this strategy, FSC First is reviewing a proposal to allocate 100% of this funding source.

### COMMERCIAL PROPERTY ASSESSED CLEAN ENERGY PROGRAM (C-PACE)

FSC First administers the Commercial Property Assessed Clean Energy (C-PACE) Program designed to assist commercial property owners with financing up to 20% of the appraised value to make qualifying energy efficiency and clean energy improvements. Examples of projects that can be funded via C-PACE are energy efficiency and conservation measures, water conservation, and clean renewable energy such as solar equipment. The loans are repaid through an annual surcharge on the owner's property tax bill. FSC First has awarded three loans as of February 2024.

## KEY PERFORMANCE METRICS

- Number of energy audits performed
- Number of energy upgrades performed – commercial and residential
- Number of referrals to Maryland Department of Housing and Community Development (DHCD) Low-Income Energy Efficiency Program (LIEEP)

## 2025 GOALS / ACTIONS

- Perform the necessary studies and analysis to set Countywide energy reduction goals.
- Identify and develop the enabling legislation to administer a Countywide deep energy retrofit program.
- Continue to provide Clean Energy Program grants until funding is spent.

# PRIORITY TASKS

## Task 1 Assess current policies and programs that incentivize or hinder deep energy retrofits for residential buildings.

Work with utilities (and Maryland DHCD LIEEP) to identify existing programs, technical assistance, incentives, and financing support to support deep energy retrofits. Identify gaps and document the need for additional support (to inform *Task 4*).

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| **Responsible Lead Entity** | DHCD |
| **Secondary/Partners** | DoE, FSC First, DSS |

## Task 2 Pass the necessary legislation and make updates to County codes, policies, and programs to facilitate the implementation of deep energy retrofits for homes and residential buildings.

Based on the assessment conducted in *Task 1*, pass resolutions, and make changes to the County's code, ordinances, policies, and programs to accelerate community-wide transitions towards more energy-efficient buildings. (Note: the details of this work will be fleshed out in the future strategy "Codes and Standards").

County programs should provide guidance and support for completing deep energy upgrades over time. These upgrades should be associated with an appropriate permitting method to avoid duplicative processes throughout the implementation of these upgrades. The County should also adopt GHG-based energy efficiency performance standards, in addition to energy efficiency standards. GHG-based standards will be more specific, thus allowing for targeted reductions of GHG emissions. These standards should continue to be reviewed in the future to ensure they remain up-to-date and consistent with the latest climate goals.

For new legislation, the following should be analyzed and considered:

- Energy reporting for non-residential buildings to meet energy and water conservation performance standards.
- Electrification of heating and hot water equipment during significant renovations of commercial and multifamily housing.
- Energy audits at title transfer.
- Reporting of energy use history and ENERGY STAR® scores when residential or commercial buildings are listed for sale.

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| **Responsible Lead Entity** | DPIE, M-NCPPC |
| **Secondary/Partners** | OCS, DoE, DHCD |

## Task 3 Support community-wide implementation of weatherization and deep energy retrofits for homes and residential buildings.

Leverage and expand existing programs needed to support community-wide weatherization and implementation of deep energy retrofits through community engagement and education. For example, developing and distributing materials on incentives, financing options, and skilled contractors will help build industry and community awareness and knowledge of the importance of deep energy retrofits. Educating and incentivizing both renters and landlords, providing information about renters' opportunities for energy efficiency and information to landlords about policies and opportunities. Training contractors in career and technical education (CTE) programs on implementing weatherization and deep energy retrofits will increase the number of skilled workers able to implement weatherization projects and deep energy retrofits. Lastly, opportunities for peer learning and connections to energy coaches should be provided to community members.

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| **Responsible Lead Entity** | DHCD, DoE, FSC First |
| **Secondary/Partners** | DPIE, Employ PGC, PGCC, PGCPS |

## Task 4 Advocate for statewide standards and financial support.

Based on the assessment in *Task 1* and feedback gathered from community engagement efforts in *Task 3*, work with neighboring jurisdictions to advocate for statewide deep energy retrofit standards and incentives.

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| **Responsible Lead Entity** | DHCD |
| **Secondary/Partners** | To be determined |

# MIS-9: ESTABLISH AND ADOPT BENCHMARKING ENERGY AND CONSERVATION STANDARDS

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Align Prince George's County building benchmarking initiatives with the recommendations of the Climate Action Plan (CAP) and the upcoming Maryland State Building Energy Performance Standard (BEPS) to reduce greenhouse gas (GHG) emissions and improve overall energy efficiency in the building sector.

Note: This strategy focuses primarily on buildings over 35,000 square feet which include publicly-owned buildings and most commercial buildings used for public activity. MIS-8 focuses on residential properties owned by public and private entities. There may be overlap and thus the two strategies should be coordinated.

## WHY IT MATTERS

Prince George's County is committed to rapidly reducing its GHG emissions. As part of that commitment, the County's 2022 CAP mandated a 50% carbon emissions reduction by 2030 (compared to 2005 levels).[10] A key pathway to achieving rapid emissions reduction lies in the establishment and improvement of building energy performance standards and benchmarks against which to track progress. At the national level, commercial and residential buildings account for nearly 30% of GHG emissions. The development of benchmarking and disclosure programs will ensure building energy and water consumption are measured and made publicly available, in turn, allowing County owners and tenants to compare performance and facilitating targeted investments in energy and water efficiency improvements. Through data collection and information sharing, such programs will also establish a baseline to build further policies aimed at increasing energy and water efficiency across Prince George's County. The combination of benchmarking with performance standards will generate building improvements that reduce the amount of energy and water used, produce ongoing economic benefits of reduced utility bills, and reduce demand on the electric grid.

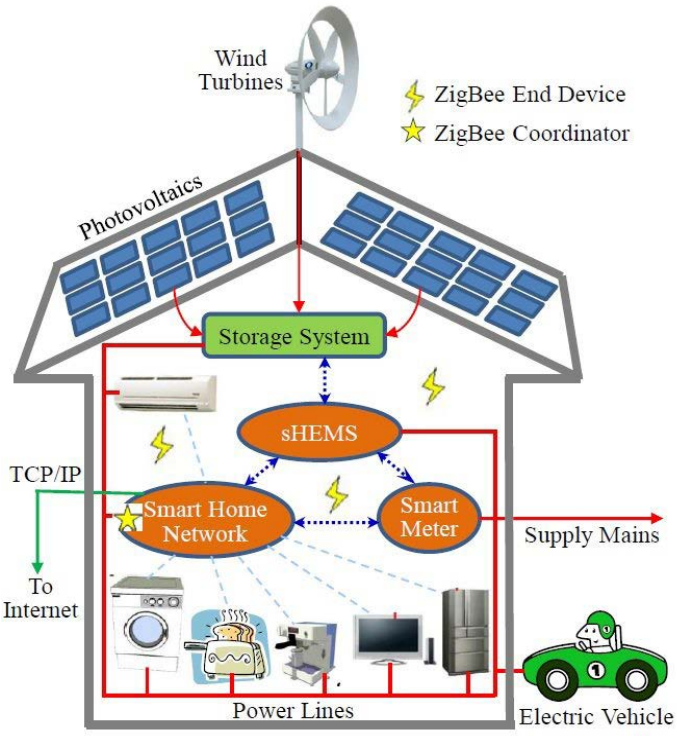
Maryland's adoption of the Climate Solutions Now Act in 2022 and its requirement that the Maryland Department of the Environment (MDE) develop Building Energy Performance Standards (BEPS) regulation addresses part of the County's CAP Priority Recommendation M-9. Recommendations from the County's CAP that are not covered by the

MD BEPS regulations include:

- Benchmarking County-owned buildings under 35,000 square feet;
- Benchmarking public housing under 35,000 square feet;
- All privately-owned commercial buildings of 25,000 square feet or greater benchmarked by the end of CY26;
- All privately-owned commercial and multi-family buildings of 10,000 square feet or greater benchmarked by the end of CY28;
- Energy and water standards incorporated into County Building Code for new buildings;
- Minimum energy and water conservation standards for existing buildings incorporated into County Code;
- A 20% reduction in net direct greenhouse gas (GHG) emissions by January 1, 2030, as compared with 2025 levels for average buildings of similar construction and;
- Net-zero direct GHG emissions by January 1, 2040.

To achieve the goals of the CAP, the County may need to adopt more stringent requirements than what is included in the BEPS regulation.

## MAGNITUDE OF BENEFIT




The establishment of building benchmarking requirements and energy and conservation standards ensures that climate resilience and energy efficiency goals are incorporated into new developments. Additionally, it verifies that energy improvements are made to inefficient existing buildings. Upfront social and economic benefits from energy efficiency improvements can include reduced energy costs for building occupants and new employment opportunities through workforce development and industry growth to implement needed energy upgrades. The County's intention to support building owners' compliance with the new BEPS requirements can enhance public access to information and local resources. BEPS can also promote additional energy resilient building improvements. As building owners consider ways to improve their buildings' energy performance, they are more likely to integrate solar panels or other renewable technologies, increasing the share of renewable energy in the community. Developing a baseline (benchmark) for key performance indicators related to energy and water usage will enable the County to identify opportunities to streamline processes that affect energy and water use, enhance the service quality, and reduce costs. These activities are anticipated to lead to improved operational efficiency and resource allocation, ultimately enhancing the County's fiscal sustainability.

## MAGNITUDE OF COST

Table III–11. Magnitude of Cost

| Annual Cost Considerations | Planning costs (years 1 – 3) | Implementation costs (years 3 – goal end) |
|---|---|---|
| Existing staff/program | Y | Y |
| Program expansion | | TBD |
| New program and capacity needs | | TBD |
| Current funding within the County budget? | Y | |
| Private Sector Involvement | N | |
| Capital* | $$$ | $$$ |
| Operations | | |
| » Salary and Benefits | | $$ |
| » Consultants | $$ | $$ |
| » Supplies and Materials | | $$ |

** Assumes federal and state support. Assumes benchmarking, audits, and retrofits begin in planning years.*

Costs for this task will include the following:

- Resources to collaborate with other localities and staff time spent on evaluating the current energy efficiency landscape.
- Relevant costs for conducting stakeholder engagement and synthesizing results to develop benchmarking requirements.
- Staff resources spent on analyzing reported building performance to determine and prioritize energy efficiency.
- Funding the retrofit of buildings not compliant with benchmarking standards.
- Developing resources for sharing data and sharing best practices with other counties.
- Staff time spent on program management and reporting for the benchmarking program.
- Website content development and maintenance.
- Technical analysis and determination of energy and water standards as well as legal evaluation and drafting of County code requirements.

## STATE AND REGIONAL COMMITMENTS / GOALS

- The 2030 Greenhouse Gas Emissions Reduction Act Plan (2021) mapped out Maryland's GHG emissions reduction goals. It called for a 50% reduction of state emissions by 2030, following the recommendations of the Maryland Commission on Climate Change.
- The Prince George's County Climate Action Plan (CAP) (2022) aimed for carbon emissions to be reduced by 50% before 2030 (and compared to 2005 levels). This goal aligned with the 2030 Greenhouse Gas Emissions Reduction Act Plan and the Metropolitan Washington Council of Government's goals for the region.
- The Climate Solutions Now Act (2022) aimed to tackle climate change through ambitious emissions reduction goals and energy efficiency and buildings-related measures. It targets a 60% reduction goal for carbon emissions by

2031 (compared to a 2006 baseline), the achievement of 100% clean energy by 2035, and net zero emissions statewide by 2045. In that spirit, the act lays out several energy efficiency and buildings-related measures (e.g., energy efficiency and emissions reduction requirements for certain buildings, requirement that electric companies increase their annual incremental gross energy savings, acceleration of the zero-emissions vehicle take-up across the state fleet, creation of an electric school bus pilot program).

» The EmPOWER Maryland Act (2008) established energy savings targets for utilities, to be realized through customer incentives and other demand-side management programs. Utilities have since implemented comprehensive residential and commercial programs under the EmPOWER mandate, subject to Public Service Commission oversight and approval procedures.

» The Climate Solutions Now Act (2022) mandated the creation of the Maryland Building Energy Performance Standards (BEPS). The initiative strives to reduce GHG emissions by improving the overall energy efficiency from Maryland's building sector for those buildings equivalent to or larger than 35,000 square feet. The regulation includes multiple requirements (for example, that covered building owners must measure and report data to the Maryland Department of the Environment (MDE), covered building owners need to meet specific net direct GHG emissions and energy use intensity standards, and record keeping and reporting requirements for electric and gas companies and district energy providers). Note the draft BEPS regulations were released to the public and are under review.

» The Climate Solutions Now Act (2022) also mandated the creation of the Building Energy Transition Implementation Task Force; appointed members are expected to recommend programs, policies, and incentives designed to reduce GHG emissions from the building sector (with a plan for funding the retrofit of covered buildings in compliance with BEPS, electrification projects incentives, low-income household holistic retrofit target, heat pump sales targets, etc.).

» Maryland's Building Energy Transition Implementation Task Force recommended updating utility data collection, automation, sharing, and aggregation practices in order to improve ability to meet benchmarking requirements.

## EQUITY CONSIDERATIONS

» During the assessment and adoption of benchmarking requirements, particular attention should be paid to rental buildings and to both subsidized and non-subsidized affordable housing. Renters often directly pay for utilities, but do not have the ability to perform energy efficiency upgrades. This can result in significant costs that can create a financial burden on low-income and fixed-income households. Owners of affordable housing also face additional barriers to complying with benchmarking requirements. Ensuring that all renters and residents of affordable housing receive the benefits of benchmarking and energy efficiency will lead to more equitable outcomes. The County should leverage benchmarking information to help identify the technical and financial support to aid landlords within low to moderate-income communities to comply with new standards rather than passing that financial burden on to their renters.

## PROGRESS FROM 2020 – 2024

» Created an Energy Manager Position in OCS (funded by DoE) to assess building performance.

» Submitted the Energy Efficiency and Conservation Block (EECBG) grant application to assist the Office of Central Services with benchmarking facilities.

## KEY PERFORMANCE METRICS

The proposed BEPS regulations initiate an ongoing annual benchmarking process, with five-year milestones for third-party data verification and long-term energy and emissions reduction goals in 2030 and 2040.


## 2025 GOALS / ACTIONS

» Upon receipt of EECBG funds conduct procurement and contract management for benchmarking/investment grade auditing services (opportunity to partner with adjacent jurisdictions on procurement).

» Collect and review building-specific information and monthly energy data for calendar year 2024, January through December.

» Create an ENERGY STAR® Portfolio Manager account and grant the Maryland Department of the Environment read-only access for BEPS-eligible properties.

» Submit calendar year 2024 building and energy benchmarking data to ENERGY STAR® Portfolio Manager by June 1, 2025.

» Using benchmarking results, identify priority County-managed buildings for investment grade audits and energy improvements with preference towards buildings in Equity Emphasis Areas (EEAs), Energy Resilience Communities (ERCs), and Climate and Economic Justice Screening Tool (CEJST) areas.

» Identify available funding sources from the County's budget including CIP and develop a final scope of work to contract and initiate and complete investment grade audits.

» Review energy audit report(s) and identify a scope of work for building energy improvements.

# PRIORITY TASKS

## Task 1 Assess the benchmarking requirements in the Climate Solutions Now Act and other existing programs.

Assess whether the benchmarking requirements in the Climate Solutions Now Act and associated proposed MD BEPS regulation are sufficient to meet the County's climate goals. Compare the requirements to the existing programs of neighboring counties and EPA's list of benchmarking programs and policies to determine if there are other requirements the County should include in a benchmarking program that go beyond the Climate Solutions Now Act.

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| **Responsible Lead Entity** | OCS, DoE |
| **Secondary/Partners** | DPIE |

## Task 2 Benchmark County-owned buildings.

County-owned buildings will be benchmarked in alignment with the Climate Solutions Now Act/ proposed MD BEPS and County benchmarking requirements. To meet the BEPS regulations, the County will need to benchmark and report on energy use for all eligible buildings within its portfolio, identify energy improvement opportunities and associated potential emissions reductions through investment grade audits, and implement energy/emissions reduction measures. There are approximately 40 County-managed facilities that are 35,000 SF or larger. These facilities are of priority interest to the County to benchmark and evaluate for energy improvements. The County will use benchmarking results to prioritize buildings for energy audits, giving special consideration to the EIGHT buildings located within the Metropolitan Washington Council of Governments Equity Emphasis Areas (EEAs), Energy Resilience Communities (ERCs), and areas identified by the Climate and Economic Justice Screening Tool (CEJST).

The proposed BEPS regulations initiate an ongoing annual benchmarking process, with five-year milestones for third-party data verification and long-term energy and emissions reduction goals in 2030 and 2040. The County will need to identify resources to support the alignment of its operations and capital improvement investments with these goals. Energy audit results will provide the County with information it can integrate into its budget and CIP planning processes, laying out a pathway to achieve the building improvements needed to meet the BEPS energy and emissions reduction requirements.

| | |
|---|---|
| **Responsible Lead Entity** | OCS (for County-owned/operated buildings), M-NCPPC (for M-NCPPC owned/operated buildings), PGCPS (for PGCPS owned/operated buildings), Municipalities (for municipal-owned/operated buildings) |
| **Secondary/Partners** | DoE, Agencies (to provide access, data, requirements, additional utility reports, etc.) |

### Task 3 Distribute or develop resources to help building managers benchmark their buildings.

Based on the internal benchmarking and reporting experience (*Task 2*), the County will collate and develop materials to assist building managers of County-owned and privately-owned buildings to meet benchmarking requirements. Materials will be posted online to be publicly available and organized in a central location. Example materials could include links to ENERGY STAR® Portfolio Manager benchmarking instructions, best practices, lessons learned, and data collection templates and instructions.

Sustainable Energy will align its ENERGY STAR® Green Leasing Grant to offer incentives for BEPS-impacted building owners and others to perform energy efficiency upgrades in office buildings and multifamily dwellings. The Maryland Clean Energy Center (MCEC), Maryland Energy Administration (MEA), and local jurisdictions will be crucial partners in implementing BEPS requirements and directing building owners to support resources. MEA and MCEC offer incentives and are developing additional grants, rebates, and loan programs. FSC would also be a critical partner in expanding C-PACE to help building owners meet new BEPS regulations as would local business associations and Chambers of Commerce. The County could also partner with affordable housing property owners or developers to help them pursue grant dollars for building energy improvements.

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| **Responsible Lead Entity** | OCS, DoE |
| **Secondary/Partners** | OIT, DHCD, Redevelopment Authority, Housing Authority |

### Task 4 Add a benchmarking dashboard and resources to the County's climate website.

Develop a webpage or dashboard on the County's CAP website that will help public and private sector building managers effectively participate in the building benchmarking program. All updates to the County website should be done in alignment with LIS-3. The County has an opportunity to streamline anticipated incoming climate data into a dedicated online portal. This portal may contain an Application Programing Interface (API) that directly links with ENERGY STAR® Portfolio Manager and will act as a reporting portal that allows for easy reporting of benchmarking data.

| | |
|---|---|
| **Responsible Lead Entity** | DoE, OCS |
| **Secondary/Partners** | To be determined |

### Task 5 Pilot deep energy retrofits on County-owned buildings.

Using the asset assessment conducted for LIS-2 Climate Criteria, undertake deep energy retrofits in 20% of County-owned buildings by 2030. Buildings should be prioritized based on the data collected through MIS-9 Benchmarking. Produce case studies of these pilot projects that can be incorporated into the CAP website in alignment with LIS-3 Community Engagement. Develop a plan to complete deep energy retrofits on remaining County properties.

## Task 5 (Continued)

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| **Responsible Lead Entity** | OCS, M-NCPPC |
| **Secondary/Partners** | DoE, DPIE |

## Task 6 Incorporate energy and water standards into County building code for new buildings.

Develop and adopt into the County's building code energy standards that align with the MD BEPS targets and the County climate standards (*Task 1*). These standards will apply to new construction and major renovation projects, ensuring that new developments and building growth will be positioned to comply with state regulations from 'day one' and the County/Building Owners will not need to invest in energy improvements after new building construction is complete. This task will be expanded in development of the section on Codes/Standards.

For new legislation, the following should be analyzed and considered:

- Energy reporting for non-residential buildings to meet energy and water conservation performance standards.
- Electrification of heating and hot water equipment during significant renovations of commercial and multifamily housing.
- Energy audits at title transfer.
- Reporting of energy use history and ENERGY STAR® scores when residential or commercial buildings are listed for sale.
- Follow the County's adoption of ICC IBC-2021, scheduled for May 29, 2024, with adoption of CC IECC-2021: 2021 International Energy Conservation Code. Formalize County review of new International Building Codes to align with the 3-year International Code Council (ICC) Code Development Process.
- Prohibition of fossil fuel connections for new buildings and extensive renovations.

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| **Responsible Lead Entity** | DPIE |
| **Secondary/Partners** | To be determined |

## Task 7 Adopt energy and water standards for existing buildings into the County code.

Develop and adopt minimum energy and water conservation standards for existing buildings into County Code. These standards should include a clear timeline of future compliance dates. This task will be expanded in development of the section on Codes/Standards.

| | |
|---|---|
| **Responsible Lead Entity** | DPIE, M-NCPPC |
| **Secondary/Partners** | To be determined |

# MIS-10: EXPAND COUNTY WASTE REDUCTION AND DIVERSION EFFORTS

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Expand and enhance existing programs for waste reduction, organics composting, and materials recovery to move toward the County's vision of "zero waste" and reduce greenhouse gas emissions from landfill operations.

## WHY IT MATTERS

Excess waste has negative environmental and community impacts, including emissions released from landfills and waste-to-energy facilities, resource impacts related to collection and hauling operations, and supply chain impacts. For example, improperly discarded waste can cause additional strain on already overburdened communities, exacerbating issues related to public health, aesthetics, and quality of life. Waste reduction programs can help minimize these impacts. Solid waste accounts for 57% of the GHG emissions associated with the County's operations and is the largest single source of emissions in the County's local government operations GHG inventory.[11] When waste breaks down in landfills or is burned in waste-to-energy facilities, it produces additional emissions. Waste, particularly organic waste, generates methane when it decomposes in landfills. Methane is a greenhouse gas (GHG) that has 27–30 times the warming potential of carbon dioxide, making it a powerful contributor to climate change.[12] Prince George's County has existing waste reduction programs; this strategy will build on those successes to further reduce the impacts of waste generation in the County and approach the goal of zero waste.

## MAGNITUDE OF BENEFIT

This strategy aims to reduce the environmental footprint of the County and to promote a more equitable and sustainable waste management system that positively impacts the well-being of the entire community. The commitment to waste reduction fosters innovation by incentivizing the development of sustainable practices and creating new markets for recycled materials. Adopting waste reduction measures offers a comprehensive approach that not only safeguards the environment but also promotes economic efficiency, innovation, and a more sustainable future.

Economic benefits of waste reduction can include lower waste collection fees for businesses and households, reduced

impact on County operations and equipment costs, and business development opportunities by providing alternative end-of-life options for materials such as recycling and composting services. Recovering compostable and divertible materials from the waste stream and reintegrating them into the economy can support local revenue generation, job creation, business expansion, and preservation of resources. Development of a local composting industry and the opportunity for increased use of compost as a soil supplement offers environmental and economic benefits to landscaping services and local food systems, improves soil quality and water retention during droughts, and increases the carbon sequestration ability of soils.

Working toward zero waste reduction goals and supporting alternate end-of-life options, such as in a circular economy where waste is recycled or reused instead of being disposed of, reduces emissions of the overall supply chain by reducing reliance on (and required resources to produce) virgin materials. Lowering the use of virgin materials lessens negative environmental impacts by reducing production, processing, and transportation emissions.

Through a comprehensive approach to analyzing waste management practices, the County can identify, evaluate, and address disparities in waste management that may disproportionately affect overburdened communities as well as ensure both equity and efficiency in waste disposal practices. This multifaceted strategy aligns with the County's commitment to promoting zero waste practices and creating a healthier, more resilient community.

## MAGNITUDE OF COST

Table III–12. Magnitude of Cost

| Annual Cost Considerations | Planning costs Task 1 (years 1 – 3) | Implementation costs Tasks 2-4 (years 3 – goal end) |
|---|---|---|
| Existing staff/program | Y | |
| Program expansion | | Y |
| New program and capacity needs | | Y |
| Current funding within the County budget? | Y | |
| Private Sector Involvement | Y | |
| Capital* | $$ | $$ |
| Operations | | |
| » Salary and Benefits | | $$ |
| » Consultants | $$ | $ |
| » Supplies and Materials | | $$ |

**Assumes state support for recycling and diversion programs.*

## STATE AND REGIONAL COMMITMENTS / GOALS

- Maryland HB 264/SB 483 Solid Waste Management Organics Recycling and Diversion – Food Residuals (2021) requires "persons" that generate at least two tons of food per week (this will decrease to one ton in November 2024) to separate food residuals from other solid waste for composting. Supporting regulations were issued under COMAR 26.01.13 Food Residuals- Organics Recycling and Waste Diversion.
- Executive Order 01.01.2017.13 Waste Reduction Recovery Plan for Maryland outlines a plan to reduce waste through sustainable materials management policy and source reduction. To implement this order, the MDE provided a Waste Reduction and Resource Recovery Plan Goals and Metrics Recommendations document in 2019 which specifies goals for waste diversion and recycling in total and by material.
- Maryland provides funding to communities through the School Waste Reduction and Composting Program to divert food waste.

## EQUITY CONSIDERATIONS

- Ensure waste management education materials are provided in multiple languages and intentionally engage with the trusted community voices of local community-based organizations to understand needs and solutions.
- Ensure that the County reduces negative impacts such as noise, smell, increased traffic, and illegal dumping near the facility when locating new satellite (ReUse or Convenience Drop-off) locations, service centers or areas where special community collection events are hosted.

## PROGRESS FROM 2020 – 2024

Cumulative waste emissions have decreased more than 28% since 2005, thanks to the implementation of numerous waste initiatives. As of fall 2023, all households receiving County trash services also have the tools to recycle food scraps in the green organics toter. As of autumn of 2022, 30% of curbside waste received as trash (that was NOT in an organics container) was organic and could be composted. Composting numbers for 2023 and 2024 are not yet available, but if DoE has met its goal of 50% of that waste being composted - it represents a reduction of at least 17,000 tons of annual GHG emissions.[13]

Numerous municipalities have also implemented both home and curbside composting programs. DoE has partnered with 12 Prince George's County Public Schools to reduce food waste and to promote food composting. In FY2024, DoE will partner with schools to increase the number of schools participating in the food scrap composting to 26 schools. Also, with the help of a grant for the development of education and outreach materials, DoE will train teachers and administrators who will later train others as the program grows.

## KEY PERFORMANCE METRICS

- Residential recyclable material recovery (tons)/year
- Residential compost collection (tons)/year
- Public school compost collection (tons)/year

## 2025 GOALS / ACTIONS

- The CEX budget supports planning efforts of $1,405,000 to complete the underlying studies and pilot programs across the strategies, as well as build a Climate Reporting Dashboard and support public engagement (detailed in other strategies).
- The CEX budget supports up to $912,500 in grant matching funds through DoE that could leverage up to $200,000,000 in federal funds to support climate action planning and implementation.
- The CEX budget supports continued educational and engagement initiatives to increase waste diversion, particularly composting.
- The CEX budget includes significant upgrades to the landfill gas (LFG) collection and reporting system and continued efforts to finalize a project for beneficial use of LFG, reducing GHG Methane emissions.

# PRIORITY TASKS

## Task 1 Conduct an emissions reduction study for County waste operations.

Develop a solicitation to assess the County's waste related greenhouse gas emissions and provide recommendations for emissions reduction from the full life cycle of waste management including landfill operations, hauling, and waste diversion programs.

The study should include:

- Analysis and recommendations for eliminating leaks and minimizing the landfill's overall greenhouse gas footprint.
- A list of the biggest waste haulers in the County.
- A timetable for transitioning hauler trucks from diesel to low emission vehicles.
- Analysis of impacts for new Area C of the landfill.
- An assessment to identify more efficient repurposing of excess methane for Renewable Natural Gas (RNG) or biogas as may be generated by future operations in tandem with improving current repurposing operations.
- A community awareness survey to better understand current cognizance of County waste diversion programs, their impact on climate change, and interest in new community-wide waste diversion programs.
- Recommendations for reducing County waste operations emissions and an assessment of capacity, feasibility, and resource needs to implement proposed recommendations.
- Analysis of impacts of the PGC Composts Program (diverting residential food scraps from trash collections to compost collections) to include residential participation rate in the new collection service.

| | |
|---|---|
| **Responsible Lead Entity** | DoE |
| **Secondary/Partners** | OCS, OMB, CountyStat |

## Task 2 Implement recommendations from the County waste operations emissions reduction study and adopt lead-by-example waste reduction and diversion practices.

Align recommendations from the County waste operations emissions reduction study with the County's Zero Waste Initiative and integrate recommendations into the County's Ten-Year Solid Waste Management Plan as well as County landfill plans and procedures.

Proceed with implementation of lead-by-example emissions reduction and zero waste strategies, to include

- Monitor progress of greenhouse gas emissions reduction and waste diversion efforts, including performing a periodic waste characterization study (e.g., every 3 years).
- Adopt and promote zero waste guidelines for all County-sponsored events (see LIS-2 Task 5).

| | |
|---|---|
| **Responsible Lead Entity** | DoE |
| **Secondary/Partners** | OCS, OMB, CountyStat |

## Task 3 Expand and maintain the curbside composting program Countywide.

Identify which municipalities, sectors, and other entities have not yet opted into the County's curbside composting program after residential curbside collection of food scraps was expanded Countywide in 2023.

In partnership with its operator of the Prince George's County Organics Composting Facility (OCF), roll out the program with any remaining municipalities and expand participation to other entities to increase the commercial food scrap and food waste tonnages being diverted from landfills.

| | |
|---|---|
| **Responsible Lead Entity** | DoE |
| **Secondary/Partners** | OCS, OMB, CountyStat |

## Task 4 Ensure access to local and safe disposal of hazardous waste materials encountered during climate resiliency and energy efficiency retrofits and after extreme weather events.

Assess the County's current hazardous waste disposal processes, programs, and procedures including capacity, eligibility to use available facilities, existing environmental justice concerns, and gaps in services for both climate-related retrofits and disposal after an extreme weather event.

Identify opportunities for more equitable access for County residents and businesses to safely dispose of hazardous waste locally. Engage disposal site managers, contractors, and the Maryland Department of Environment (MDE) in these discussions, especially as it relates to properly handling hazardous waste generated following an extreme weather event.

**Task 4 (continued)**

Conduct a feasibility study for improvements. The study should include:

- County capacity to handle extra material
- Alternate disposal and recycling strategies
- Feasibility of potential disposal options for contractors
- Potential improvements to post-disaster disposal practices
- Potential unintended consequences of transporting and managing hazardous materials
- Public health protection needs associated with adopting recommended strategies

Implement identified improvements to hazardous waste disposal in the County

| | |
|---|---|
| **Responsible Lead Entity** | DoE |
| **Secondary/Partners** | State of Maryland |

**Task 5**

## Expand and promote community-wide waste diversion programs.

Expand community education and outreach on community-wide waste diversion programs and their impact on climate change, applying the findings from the waste diversion community awareness survey from Task 1 to inform the expansion of County waste diversion programs.

Consider the following strategies:

- Use local consumption data and an embodied-carbon emissions inventory to educate the public about impacts of various consumer choices on greenhouse gas emissions and the waste stream.
- Develop a public outreach campaign that ties together the County's zero waste and climate initiatives.
- Develop public online clearinghouse for information about reuse programs, repair services, and donation centers in the County, so residents and businesses have easy one-stop access to opportunities to extend the lives of their materials. Businesses and residents could use the database through the PGC311 information center or the County's website.
- Intensify education and enforcement of the recycling mandates, including the Expanded Polystyrene Ban, single-use plastic bag ban, and Multifamily and Commercial/ Business Recycling Laws.
- Promote the benefits of using reusable, washable bags.
- Establish a Waste Stream Diversion Advisors program for communities and municipalities to provide guidance on the proper handling and disposal of hazardous materials encountered during renovation projects, repurposing building materials and salvaging household items, recycling, and other waste diversion efforts at a community-wide scale.
- Coordinate with local schools, colleges, and universities on waste-related programming and partner on developing educational outreach opportunities.
- Partner with businesses, restaurants, and County institutions to participate in

**Task 5 (Continued)**

scaled-up waste diversion efforts and composting food waste through Green Business certification, promoting success stories, and educating on the cost savings of a waste reduction program.

» Provide financing, grants, or subsidies to individuals and businesses to develop the County's businesses for reuse and donation of materials.

» Provide free reusable bags to people receiving food assistance.

» Establish a community Reuse Center.

» Evaluate implementation of a Pay-as-You-Throw (PAYT) fee program that tracks the average annual quantity of trash/recyclables generated per household and savings and creates community-wide goals and benchmarks.

» Pilot reverse-vending machines at public gathering places to test behavioral and financial incentives to increase recycling of plastic, decrease litter and trash along roads, streams, and communities.

  - Form a study group to determine the "how," "who," "source of funding," and all the resources needed to implement a reverse vending machine.
  - Identify equipment technicians, locations of machines, and delivery of the collected bottles to the Materials Recycling Facility.
  - Publicize the pilot program to help support statewide container deposit legislation efforts.

| | |
|---|---|
| **Responsible Lead Entity** | DoE |
| **Secondary/Partners** | OCS, OMB, CountyStat, State of Maryland |

# MIS-11: MAINTAIN A CLIMATE-RESILIENT EQUITABLE FOREST AND TREE CANOPY COVER

**IMPLEMENTATION STRATEGY STATUS:**

**UNDER DEVELOPMENT**

## SECTION III MITIGATION ENDNOTES

1 A ZEV is either 1) an electric vehicle or 2) a vehicle that produces zero exhaust emissions of any criteria pollutant (or precursor pollutant) under any possible operational modes and conditions or 3) Any other vehicle with a fuel that contains no carbon or nitrogen compounds, that has no evaporative emissions, and that burns without forming oxides of nitrogen, carbon monoxide, formaldehyde, particulate matter, or hydrocarbon compounds.

2 EPA Fast Facts on Transportation Greenhouse Gas Emissions. https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions

3 Prince George's County. Climate Action Plan, 2022. Figure IV-2. Year 2018 County GHG Emissions by sector and Figure IV-3. Emissions from County Operations, p.24. https://e.issuu.com/embed.html?d=draft_climate_action_plan_01-15-2022&hideIssuuLogo=true&showOtherPublicationsAsSuggestions=true&u=environment.mypgc.us.

4 U.S. Department of Energy. Electric Vehicles Benefits and Considerations. 2023 Alternative Fuels Data Center: Electric Vehicle Benefits and Considerations (energy.gov)

5 Ibid

6 Maryland Department of the Environment. School Bus Funding Webinar, December 6, 2023. https://mde.maryland.gov/programs/air/MobileSources/Documents/MDE%20Electric%20School%20Bus%20Webinar%20-%2012.6.2023.pdf

7 Excludes public safety fleet

8 U.S. GAO. Telework: Growth Supported Economic Activity During the Pandemic, but Future Impacts Are Uncertain. 2023. Telework: Growth Supported Economic Activity During the Pandemic, but Future Impacts Are Uncertain | U.S. GAO

9 https://www.aceee.org/research-report/u2006

10 This Priority Recommendation targets #2 in the PG CO GHG Inventory (23 percent). Draft CAP Appendices - B1 https://www.princegeorgesCountymd.gov/sites/default/files/media-document/dcv39344_draft-cap_-appendices.pdf

11 Prince George's County. Climate Action Plan, 2022. Figure IV-3. Emissions from County Operations, p.24. https://e.issuu.com/embed.html?d=draft_climate_action_plan_01-15-2022&hideIssuuLogo=true&showOtherPublicationsAsSuggestions=true&u=environment.mypgc.us.

12 US EPA. Understanding Global Warming Potentials. https://www.epa.gov/ghgemissions/understanding-global-warming-potentials.

13 Average household (HH) lbs per year form 2022 waste sort were 613.7, representing 439 net GHG lbs/HH (https://www.epa.gov/warm), multiplied by 175,000 housholds served equals ~34,847 metric tons, so a 50% reduction is a 17,424 tons per year for County.

# IMPLEMENTATION STRATEGIES

## ACTION AREA:

# ADAPTATION

**AIS-2: BUILD THE MANAGEMENT OF CLIMATE CHANGE RISK INTO ALL COUNTY CODES, STANDARDS, PRACTICES, AND GUIDES TO BETTER MANAGE STORMWATER AND REDUCE FLOODING**

**AIS-3: ESTABLISH CLIMATE-RESILIENT LAND USE REGULATIONS TO STEER DEVELOPMENT TO HIGH GROWTH AREAS, MINIMIZE IMPACTS TO NATURAL RESOURCE AREAS, AND REDUCE THE COUNTY'S EXPOSURE TO FLOOD RISKS**

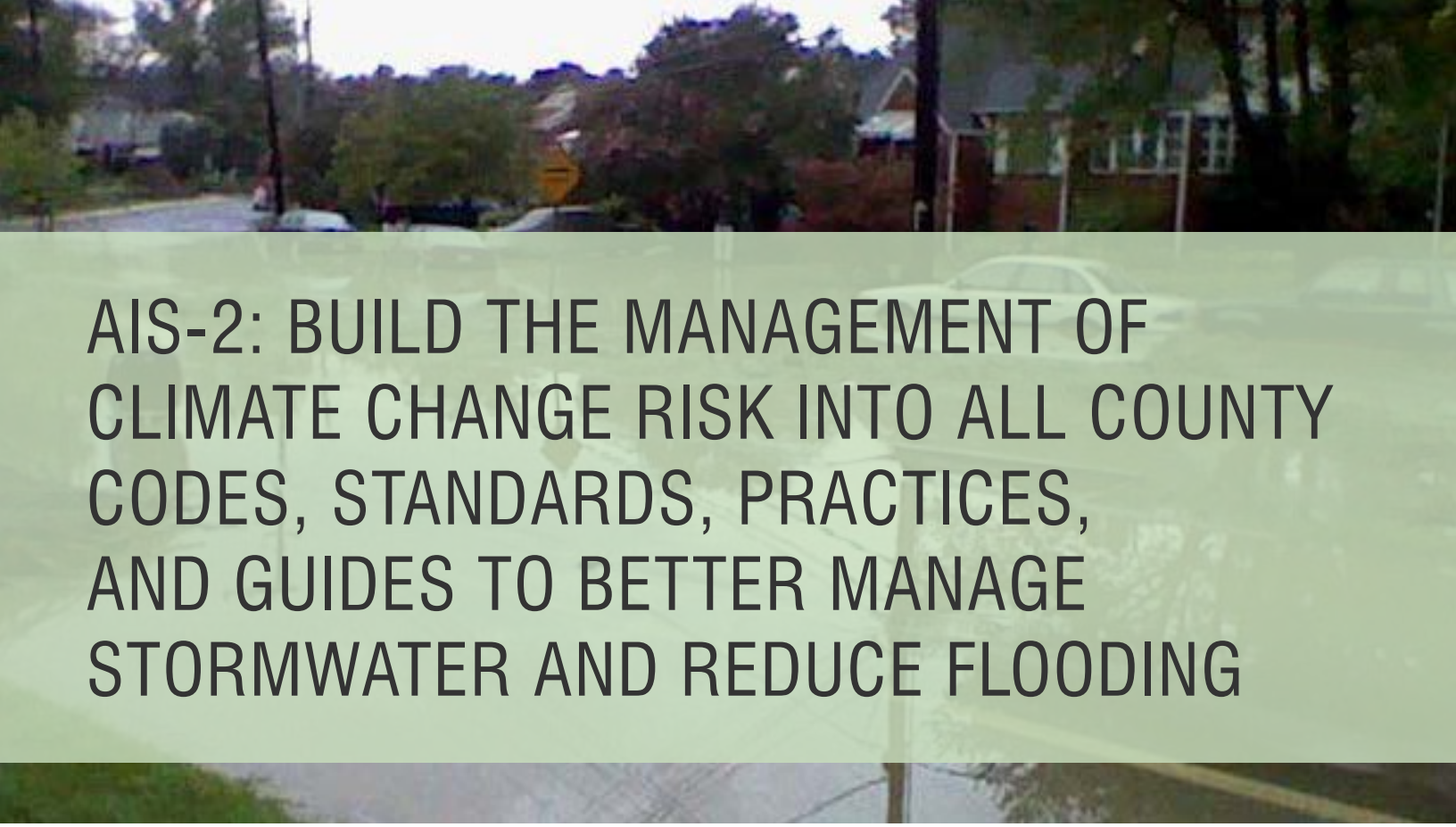
**AIS-4: EVALUATE AND ADDRESS CLIMATE RISK TO DAMS AND LEVEES**

**AIS-7: REDUCE EXPOSURE OF VULNERABLE POPULATIONS TO EXTREME HEAT**

**AIS-8: ESTABLISH RESILIENCE HUBS TO SERVE THE NEEDS OF VULNERABLE COMMUNITIES**

**AIS-9: ADOPT CODES, STANDARDS, AND PRACTICES TO SUPPORT A CLIMATE-READY PRINCE GEORGE'S COUNTY**

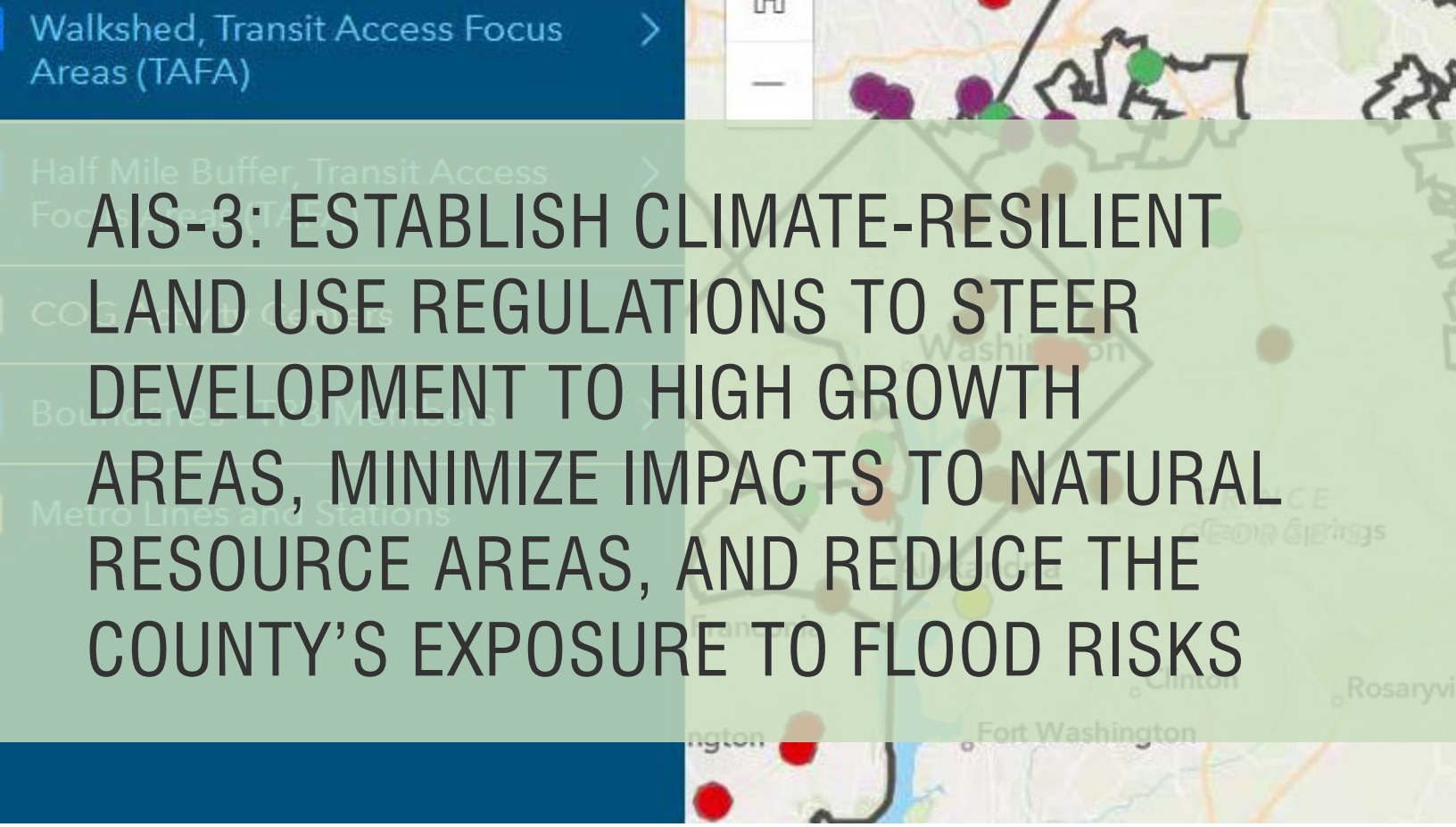
**AIS-10: PROMOTE A CLIMATE RESILIENT FOOD SYSTEM SUPPORTED BY LOW-CARBON, CLIMATE-SMART AGRICULTURE AND SUSTAINABLE FARMING PRACTICES**



# AIS-2: BUILD THE MANAGEMENT OF CLIMATE CHANGE RISK INTO ALL COUNTY CODES, STANDARDS, PRACTICES, AND GUIDES TO BETTER MANAGE STORMWATER AND REDUCE FLOODING

**IMPLEMENTATION STRATEGY STATUS:**

**UNDER DEVELOPMENT**




# AIS-3: ESTABLISH CLIMATE-RESILIENT LAND USE REGULATIONS TO STEER DEVELOPMENT TO HIGH GROWTH AREAS, MINIMIZE IMPACTS TO NATURAL RESOURCE AREAS, AND REDUCE THE COUNTY'S EXPOSURE TO FLOOD RISKS

**IMPLEMENTATION STRATEGY STATUS:**

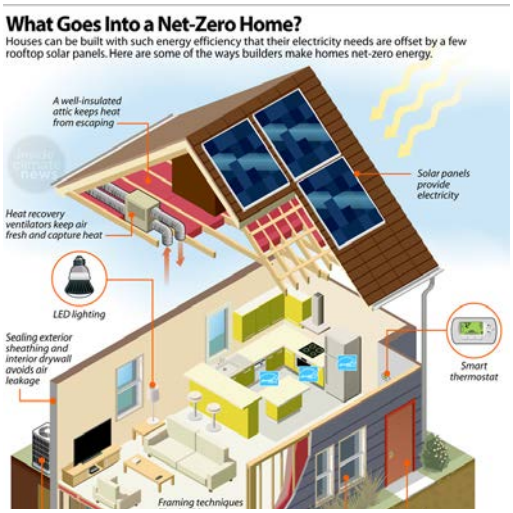
**UNDER DEVELOPMENT**

# AIS-4: EVALUATE AND ADDRESS CLIMATE RISK TO DAMS AND LEVEES

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Precipitation events are expected to change in frequency and severity due to climate change. To reduce risk to life and property below high-hazard and significant-hazard dams and accredited levees, the performance of these structures will need to be assessed using localized climate projections. Depending on the results of that assessment, changes may need to be made to management plans and upgrades may be necessary. To further protect communities from flooding, new development should be restricted in the flood inundation areas below these structures in case failure does occur.

Figure III–6. Map of classified dams




## WHY IT MATTERS

Prince George's County has a network of flood control structures, including dams and levees, to manage flood risk. However, many of the dams and levees located within Prince George's County were designed based on progressively outdated rainfall and, flood datasets and projections. These were a result of continuing changes in weather patterns, frequency, and severity in our region. Climate-driven impacts, including an increase in the frequency and severity of heavy precipitation events, can accelerate structural aging and place increased stress on dams and levees, potentially contributing to the failure of these infrastructures. High-hazard dam and levee failure could result in loss of life, extreme financial costs, and severe damage to critical infrastructure.

The National Inventory of Dams shows there are 34 classified dams in Prince George's County (shown in yellow in Figure 1). Of these, 20 (10 high-hazard, 9 significant-hazard, and 1 low-hazard) are owned and/or operated by Prince George's County. Assessment of high-hazard dams and levees is critical to better understand and identify the most-needed infrastructure upgrades and long-term investments required to protect downstream communities and environments.

## MAGNITUDE OF BENEFIT

Taking action to reduce the risk of dam failure and subsequent flood-driven damage creates opportunities for increased public safety and welfare, avoided financial costs, and improved overall climate resilience. For communities located below dams and landward of accredited levees, flooding caused by dam or levee failure may necessitate the evacuation and displacement of people. According to FEMA, just one inch of water flooding a home can cause about $25,000 worth of damage.[1] When prepared for climate change and extreme weather events, these structures provide reservoirs for storing water, regulate water flow to help mitigate both flooding and drought impacts, prevent excessive erosion of riverbanks and downstream areas, and enable the production of food and renewable energy, translating into further economic benefits. Evaluating and addressing risks to dams and levees can help ensure communities can withstand impacts from heavy precipitation and drought, while identifying areas for improvement to enhance the structure's ability to support ecosystems and perform erosion control and waterflow regulation. These improvements will require additional construction work for retrofitting projects and maintenance activities over time. Thus, these projects can create new jobs and training opportunities to the surrounding areas providing additional economic benefits.

## MAGNITUDE OF COST

Table III–13. Magnitude of Cost

| Cost Considerations | Planning costs Tasks 1 and 2 (years 1-3) | Implementation costs Tasks 3 and 4 (years 3 – goal end) |
|---|---|---|
| Existing staff/program | Y | Y |
| Program expansion | TBD | |
| New program and capacity needs | | TBD |
| Current funding within the County budget?* | Y | |
| Capital** | | $$$ |
| Operations | | |
| » Salary and Benefits | | $$ |
| » Consultants | $$ | $$ |
| » Supplies and Materials | | |

**Assumes funding for basic staff and maintenance for County-owned owned dams, not privately owned.*
***Assumes federal and state funding (FEMA/MEMA).*

## STATE AND REGIONAL COMMITMENTS / GOALS

- Maryland Climate Adaptation and Resilience Framework Strategy 3.1 commits to
  - Considering water and hazard management in zoning and building plans;
  - Working with Maryland Emergency Management Agency (MEMA) to develop tools for local governments to integrate climate resilience into local hazard mitigation plans, and
  - Establishing quantitative standards for permits to ensure that applicants account for the impacts of climate change in their infrastructure.
- Maryland EO 01.01.2014.14 (2014) aims to deliver tools to local governments to bolster climate resilience/planning in local laws and ordinances.
- Maryland EO 01.01.2012.29 (2012) directs all state agencies to consider the risks of flooding and sea level rise due to climate change in siting and design of structures.

» In 2021, MEMA updated its hazard mitigation plan. The updated plan committed to improving data collection and technical assistance tools to help counties and municipalities update buildings codes and ordinances to minimize hazard due to climate related flooding events.

» Per Maryland statute, the University of Maryland Center for Environmental Science (UMCES) is responsible for publishing a quinquennial report updating Maryland's sea-level rise projections.

## EQUITY CONSIDERATIONS

» Consider the cumulative burdens that communities face when prioritizing upgrades for high-hazard and significant-hazard dams and certified levees

» Increase awareness of the potential risk of dam and levee failure to the communities that will be impacted by them. Expand education and outreach efforts (e.g., providing accessible maps – online and static/paper maps of flood control structures) to increase community awareness of their risk level. Ensure information is available in multiple languages based on community demographics.

» Invest in highly visible signage using international standards for symbols that indicate safety issues, inundation zones, and evacuation routes.

» Create a warning system to ensure impacted communities are notified in the event of failure.

## PROGRESS FROM 2020 – 2024

DoE and DPW&T have worked with MDE to review the County's dams and levees and determine if they are properly categorized. The MDE Dam Safety Division (DSD) identified an additional 13 classified dams between 2020-2024, resulting in a total of 20 classified dams in the County.

DoE has performed high-hazard dam inspections and updated their Emergency Action Plans. DoE performs periodic dam breach analysis on high-hazard dams and updates their Classified Dams Emergency Response Plan as needed. DPW&T has performed ongoing maintenance of the dams. The County has developed and funded six CIP projects to remediate hazards and risks identified to dams, and continues to evaluate the current inventory of dams to determine if additional projects are required.

## KEY PERFORMANCE METRICS

» Number of Classified Dams Identified

» Status of Dams

» Homes/Structures at risk

## 2025 GOALS / ACTIONS

DoE will undertake a Classified Dam Operations and Maintenance (O & M) Analysis and Study in FY25. This study will inform the County on best practices in classified dam operations.

» Role & Responsibility

» Funding

» Regulatory Reporting

» Emergency Response Operations

» Risk Protocol - Identifying the scale/capacity of County Resources to manage the Classified Dam maintenance and operations, and Emergency Response.

The County has developed and funded six CIP projects to remediate hazards and risks identified to dams, and continues to evaluate the current inventory of dams to determine if additional projects are required. These projects will continue through the process of identification, design, permitting and construction.

# PRIORITY TASKS

## Task 1 Assess climate projections and the consequences of failure.

Use localized climate projections to model future hydrological loads to high-hazard and significant hazard dams; accredited levees; and interdependent components and determine the consequences if these structures fail. Identify other structures that could be categorized as high-hazard or significant-hazard dams and determine risk profile and ownership of these structures as well.

**Consideration list:**

- DoE will undertake a Classified Dam Operations and Maintenance Analysis and Study in FY25. This study will inform the County on best practices in classified dam operations.
- Future studies needed include:
  - Public Pond Inventory Assessment (PIA). The PIA will assess the Countywide inventory of public ponds for potential risk profiles necessitating reclassification as classified dams.
  - Determine if inundation zones need to be revised under localized climate projections.
  - A vulnerability assessment to prioritize which of the existing high-hazard and significant-hazard dams and accredited levees should be prioritized.
  - A preliminary financial plan for infrastructure upgrades.
- Coordinate with the Army Corps of Engineers to ensure that any risks to communities below federally owned and maintained dams are addressed.

| | |
|---|---|
| **Responsible Lead Entity** | DPW&T |
| **Secondary Partners** | DoE/SCD |

## Task 2 Incorporate findings into management plans.

After the assessment is completed (*Task 1*), evaluate and update each high-hazard dam's emergency action plan and each accredited levee's O&M plan to incorporate projected climate change impacts and identify areas of concern for public safety.

| | |
|---|---|
| **Responsible Lead Entity** | DPW&T |
| **Secondary Partners** | DoE, SCD |

## Task 3 Prioritize and perform upgrades.

Retrofit ponds to meet dam safety classification requirements. Perform once *Task 1* and *Task 2* are complete and in consultation with MDE, DSD on current regulatory compliance standards and regulations in outyears as budget allows. Upgrade priority flood control structures based on the assessment in *Task 1* and equity considerations to increase their capacity to manage large rain events. Upgrades should be performed in a way that supports other Climate Action priorities, including limiting tree removal and disturbance as much as possible during construction. Leverage near-term restoration or other improvement projects at dam sites to perform on-site climate impact analyses.

| | |
|---|---|
| **Responsible Lead Entity** | DPW&T |
| **Secondary Partners** | DoE, SCD |

## Task 4 Review future development in flood inundation areas below existing high-hazard dams.

After the assessment is completed (*Task 1*), evaluate and update each high-hazard dam's emergency action plan and each accredited levee's O&M plan to incorporate projected climate change impacts and identify areas of concern for public safety.

| | |
|---|---|
| **Responsible Lead Entity** | DPW&T |
| **Secondary Partners** | DoE, SCD |

# AIS-7: REDUCE EXPOSURE OF VULNERABLE POPULATIONS TO EXTREME HEAT

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Develop and implement strategies to reduce the human health impacts of extreme heat in the County, especially in underserved and climate-vulnerable communities. The County should directly implement cooling practices on County-owned property and should develop programs to encourage the private adoption of heat mitigation strategies. Actions should be prioritized in the most heat vulnerable communities.

## WHY IT MATTERS

As the frequency and severity of heat waves increases, the County is called to implement strategies to combat extreme heat to protect the health and well-being of its residents. Exposure to extreme heat can cause heat cramps, heat exhaustion, heatstroke, and hypothermia, and high temperatures can exacerbate chronic conditions, such as cardiovascular, respiratory, and cerebrovascular disease.[2]

A proactive approach must emphasize both the prevention and treatment of heat-related illness. Conducting a Countywide heat vulnerability assessment, undergrounding overhead utilities, and developing heat mitigation and adaptation strategies are crucial steps for protecting the health of the County's people in the face of extreme heat.

The burden of extreme heat is not experienced equally; low-income residents in urban areas face higher temperatures due to a lack of access to air conditioning and the urban heat island (UHI) effect. Surface temperatures in urban neighborhoods are typically higher due to the absorption of heat by urban structures and lack of green space.[3] Additionally, residents without shelter and those working outdoors are more exposed to extreme heat. Migrant and immigrant workers in the US are particularly vulnerable to heat-related illness, injury, and mortality, as these groups are more likely to work in outdoor jobs exposed to extreme temperatures.[4] These communities are also less likely to have access to healthcare and resources to improve any heat-related conditions. Developing and implementing strategies to reduce heat-related impacts should be prioritized for communities who have higher exposure and decreased adaptative capacity.

## MAGNITUDE OF BENEFIT

Combating extreme heat has a wide range of both health and economic benefits. Developing strategies to adapt to higher temperatures and heat waves can help reduce heat-related deaths and hospitalizations while avoiding healthcare costs and lost wages due to lost labor hours associated with heat waves. Extreme heat can also impact worker productivity, further impacting economic stability.

Making heat adaptation resources more accessible for all communities will greatly enhance the resilience of vulnerable populations in the face of climate change, contributing to a more just and equitable Prince George's County. For example, one potential strategy is to create more cooling centers in urban areas. Cooling centers would allow individuals living or working nearby to escape the heat, reducing the risk of heat-related illness.

## MAGNITUDE OF COST

Table III–14. Magnitude of Cost

| Cost Considerations | Planning costs Tasks 1-3 (years 1 – 3) | Implementation costs Task 4 (years 3 – goal end) |
|---|---|---|
| Existing staff/program* | Y | Y |
| Program expansion | | Y |
| New program and capacity needs | | Y |
| Current funding within the County budget? | | |
| Private Sector Involvement Y/N | Y | |
| Capital | $$ | $$$ |
| Operations | | |
| » Salary and Benefits* | | $$ |
| » Consultants | | |
| » Supplies and Materials | | $$ |

**Assumes Tasks 1-3 can be completed with current staff.*
***Assumes program expansion and staff as Task 4 is implemented.*

## STATE AND REGIONAL COMMITMENTS / GOALS

- The Maryland Department of Health Extreme Heat Emergency Plan (2023) guides actions during an extreme heat event for the state, partner agencies and organizations, and local health departments. Actions are outlined for pre-summer, pre-event, extreme heat events, complex heat emergencies, and post-summer.
- Maryland's EmPOWER program aids in providing weatherization with one goal of reducing behavioral energy usage adjustments due to financial constraints – allowing vulnerable customers the resources to cool their homes comfortably during extreme heat.
- In 2020, Maryland enacted HB 722, which protects workers from heat stress. The sponsor of the bill noted that it was introduced and "designed to mitigate the effects climate change is having on state residents".
- The Maryland Climate Change Health Adaptation Program is a comprehensive strategy to reduce the State's vulnerability to climate change (including extreme heat). This program provides tools, resources, and technical assistance for citizens, communities, non-governmental organizations, schools, local governments, planners, and State agencies.
- The Environmental Public Health Tracking Tool includes information on rates of emergency department

visits for heat stress, rates of hospitalizations for heat stress, and days over the heat stress threshold. There is Countywide and statewide data available. This tool is aimed at tracking environmental hazards and human health to provide useful data to federal, state, and local agencies who in turn can implement more public health actions.

» Prince George's County has created cooling centers—safe places where all citizens can go to escape high temperatures. These centers are spread throughout the County and are designed to reduce the number of heat-related hospitalizations.

» Though the rule has not yet gone into effect, Maryland Department of Labor has proposed an OSHA Heat Stress Rule. This rule would provide workers in Maryland with protections from heat stress, thus reducing the rates of heat-related illnesses and death.

## EQUITY CONSIDERATIONS

» Cooling efforts should be prioritized in vulnerable communities. This may include communities with limited green space and low tree canopy cover, economically disadvantaged communities, and/or communities with populations that are more vulnerable to the adverse health impacts of heat such as the elderly or those with high levels of respiratory conditions.

» Heat mitigation and cooling projects in vulnerable communities should be co-developed to ensure community needs are met and that there is community support for projects. The co-benefits of cooling projects should be emphasized through this process.

» Provide information, incentives, and subsidies to low- and moderate-income households and rental properties to support the implementation of cooling and heat-mitigation projects on private property.

## PROGRESS FROM 2020 – 2024

DoE has partnered with researchers at NASA Goddard to perform an initial high-level extreme heat vulnerability assessment that will be complete in FY24. In the summer of 2023, in response to the extreme heat events, the County Executive's Cabinet convened a special meeting, led by the CAO and Health Officer, to develop protocols and processes to warn and protect County employees from extreme heat.

## KEY PERFORMANCE METRICS

» Number of heat assessment areas or sensors

» Square feet of commercial roof/square feet of (green, cool, pv) roof

» Square feet of residential roof/square feet of (green, cool, pv) roof

» Urban Canopy (see MIS-11 Trees)

» Miles of roadway/ miles of cool roadway

» Miles of sidewalk/ miles of cool sidewalk

» Miles of sidewalk/ trees per mile

## 2025 GOALS / ACTIONS

» At this time, this priority is not directly funded (there are tree programs/housing programs/ energy programs that work in parallel) as it does not fit within the core responsibilities of any agency. Grants will be sought to fund both analysis and solutions.

» DPW&T and DoE will continue efforts to increase Urban Tree Canopy to reduce Urban Heat Islands.

» DHCD will continue weatherization efforts.

» DoE, Sustainable Energy Program will continue to fund upgrades in the Energy Resilient Communities to address inefficiencies in heating/cooling.

# PRIORITY TASKS

## Task 1 Assess where vulnerable populations will be exposed to extreme heat.

Use existing mapping resources to identify priority communities. Ground-truth identified areas with on-site sensors and monitoring to verify which communities are the most vulnerable. Identifying these communities will help the County prioritize where cooling practices and heat-mitigation strategies should be employed.

**Consideration list:**

- Identify areas of social vulnerability. The focus should be on populations that are particularly vulnerable to the health impacts of heat.
- Identify heat islands where temperatures are expected to be elevated. Areas with elevated overnight temperatures should be of particular concern.
- Use sensors and on-the-ground monitoring to verify the areas identified through mapping.

| | |
|---|---|
| **Responsible Lead Entity** | DoE, OHS/OEM & M-NCPPC |
| **Secondary Partners** | OEM, Health Department, OCR, Public Safety/Fire Department, DPW&T, DPIE, DHCD, Municipalities |

## Task 2 Co-develop heat reduction strategies with priority communities.

Assess heat mitigation techniques that have been used in other jurisdictions to develop a short list of potential programs and projects that could be adopted in the County. Implement pilot projects in partnership with priority communities to select and test heat reduction interventions. Using the information collected through the pilot projects and community engagement efforts, replicate and scale successful interventions.

| | |
|---|---|
| **Responsible Lead Entity** | DoE & OHS/OEM |
| **Secondary Partners** | OEM, Health Department, OCR, Public Safety/Fire Department, DPW&T, DPIE, DHCD, Municipalities, M-NCPPC, Parks |
| **Special Considerations** | This is an essential step for ensuring equity in this process. The community engagement necessary to co-develop heat mitigation and cooling strategies in priority communities will help ensure support for these programs and practices. |

## Task 3 Review, and if required, revise Prince George's County Code to facilitate the implementation of heat reduction and cooling practices in sidewalks/roadways/parking areas.

Evaluate, and if required, revise the County Code to facilitate the implementation of cooling practices in sidewalks/roadways/parking areas and to reduce the size and scale of parking lots and to improve walking and biking access to businesses/stores/restaurants.

**Consideration list:**

- Incentivize/prioritize use of green/cool pavements in street and sidewalk replacement and repaving projects performed by the County and Municipal governments.
- Prioritize evaluating revisions to County road design standards to require use of green/cool pavements in new street, parking lot and sidewalk development by private developers.
- Where feasible, consider implementing new sidewalks or sidewalk repair projects to create soil volume and use tree-friendly permeable paving materials with low reflectance and cooling properties.
- Review maximum allowable street tree spacing based on tree species to minimize the space between street trees without infringing on other Climate Action practices, such as stormwater management facilities.
- Upgrades should be implemented as replacement or repaving projects take place to minimize disruption and costs and provide for holistic planning.
- One of the most consistent complaints heard from residents in "town centers" is that to access the grocery/retail/restaurants, they have to travel across large, hot, parking lots by foot. This results in them choosing to drive, even when walking would be their preference.
- Review opportunities to incentivize or require developments in "town centers" and other walkable or potentially walkable communities to create a safe, cool, walking path to the businesses for surrounding residents.

| | |
|---|---|
| **Responsible Lead Entity** | Climate Task Force/Climate Cabinet defined in LIS-1 |
| **Secondary Partners** | DPIE, DPW&T, M-NCPPC, DoE |
| **Special Considerations** | Use of cool materials may not always be feasible within budget constraints, and maintaining roads is a baseline role of government. DPW&T & DPIE must also consider pedestrian, biker and driver safety, ADA accessibility, expansion of the County's network of walkable and bikeable streets and sidewalks, and other priorities in making decisions with limited resources. |

## Task 4 Develop programs and incentives to encourage the adoption of cooling practices by residents and commercial property owners.

**Consideration list:**

- Incentivize new roof and major roof replacements to be: green roofs, solar photovoltaic (PV) systems, or cool/high-albedo roofs.
- Utilize public buildings to "lead by example" by implementing green roofs, solar photovoltaic (PV) systems, or cool/high-albedo roofs.
- Adopt incentives to encourage the private implementation of green/cool solar photovoltaic (PV) or green roofs.
- Adopt incentives to encourage the use of green/cool pavements for redevelopment of existing commercially owned/operated parking lots, sidewalks and streets, as well as residential parking areas and driveways.

| | |
|---|---|
| **Responsible Lead Entity** | DPIE |
| **Secondary Partners** | OCS, DoE, DPW&T, County Council |

### FUTURE CONSIDERATIONS

In future iterations of the plan the following strategies will be evaluated:

- Strategies to ensure that vulnerable populations have access to cooling in their homes.
- Strategies to ensure that all schools, daycares, and senior care facilities have adequate cooling.
- Strategies to ensure that "cooling centers" exist for individuals who do not have access to a cool shelter.
- Strategies to ensure that the Grid is able to handle the cooling load, and reduce risk of brown-outs and black-outs (limited County control).
- Strategies to ensure homes are sufficiently energy efficient to maintain a cool temperature at an affordable cost.
- Strategies to ensure that recreation is available as the number of extreme weather days increases.
- Strategies to ensure businesses are energy efficient to reduce load on grid/risk of brown-outs and black-outs.
- Strategies to protect County workers from heat-related injuries.

# AIS-8: ESTABLISH RESILIENCE HUBS TO SERVE THE NEEDS OF VULNERABLE COMMUNITIES

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Resilience Hubs[5] are community facilities designed to support residents by coordinating communication, distributing resources, and reducing carbon pollution, all while improving quality of life. They serve as vital centers during disruptions like climate-related events. Their flexible design allows for customization to suit the unique needs of each community.[6] The County should establish resilience hubs to meet the needs of residents. These hubs should exist in tandem with other County resources such as emergency shelters and cooling centers (see definitions in End Note). Establishing hubs that are accessible to vulnerable communities (which may include a planned transit component or may include mobile hubs) should be prioritized.

## WHY IT MATTERS

Resilience hubs are important for supporting vulnerable community members during and after an emergency. Climate events such as extreme heat and flooding can lead to widespread power outages and other hazards to human health and safety. Resilience hubs support individuals during and after hazardous events by providing access to emergency heating and cooling, phone charging, web-based communications, and more. For example, a resilience hub could provide a haven in urban heat islands by offering an air-conditioned location during extreme heat events. This has the potential to reduce healthcare costs associated with hazardous events, such as heat-related illnesses. Furthermore, resilience hubs are often designed to have backup power and/or microgrids, so they are less likely to experience power outages even if the surrounding areas do. This helps to limit economic and social disruption.

Resilience hubs also help address issues of equity. Not everyone has equal access to emergency resources, such as robust air conditioning, and vulnerable populations often face more risks during hazardous events due to factors like lower income and underlying health conditions. By offering a public community space, resilience hubs help all individuals access resources during emergencies, reducing the exacerbation of existing inequities from hazardous events. These resilience hubs are often housed in trusted community-managed facilities, like civic centers, meaning they are free to visit. Additionally, the organizations that manage these centers usually have pre-existing

relationships with the communities, meaning they can aid in outreach and spread awareness about the hub. As community spaces, resilience hubs can also serve as places to host workshops and educational events year-round to build community resilience and bolster adaptive capacity. This ongoing function of resilience hubs can better prepare communities to respond the next time a climate crisis occurs.

## MAGNITUDE OF BENEFIT

These facilities can provide a range of benefits by fostering community cooperation and strengthening local climate resilience and access to adaptation resources. Resilience hubs can lift the burden of extreme weather events on vulnerable households and emergency response teams, host programs and services related to health and disaster preparation, and distribute informational resources and protective equipment. These benefits can help community members and households avoid the costs associated with climate impacts by ensuring resources like potable water, refrigeration, electricity, and Internet are accessible through extreme weather events.

Municipalities can seek funding to support capacity-building activities, including project scoping activities for resilience hubs, through FEMA's Building Resilient Infrastructure and Communities (BRIC) program. In 2022, $2.133 billion was made available for eligible project applications, and the maximum allocation to states or territories for these activities was $1 million per applicant.[7] Eligible mitigation measures related to resilience hubs include purchasing and installing back-up power equipment, implementing retrofits to buildings that house resilience hubs, integrating wildfire and flood mitigation measures for resilience hub buildings, and installing tornado shelters or other wind protective measures.[8]

## MAGNITUDE OF COST

Table III–15. Magnitude of Cost

| Annual Cost Considerations | Planning costs (years 1 – 3) | Implementation costs (years 3 – goal end) |
|---|---|---|
| Existing staff/program | Y | |
| Program expansion | | TBD |
| New program and capacity needs | | |
| Current funding within the County budget? | N | |
| Private Sector Involvement | N | |
| Capital* | | $$ |
| Operations | | |
| » Salary and Benefits | $ | $ |
| » Consultants | | |
| » Supplies and Materials | $ | $ |

* *Assumes supplemental federal and/or state funding*

## STATE AND REGIONAL COMMITMENTS / GOALS

- The Baltimore Community Resilience Hub Program expanded the number of community resilience hubs around the city. As of 2023, there are 18 Resiliency Hub partner organizations. Additionally, this program is trying to outfit partner organizations with solar power and battery back-up capabilities to ensure resilience in the face of extreme climate events. This program intends to continue expanding and will establish more hubs in the future.
- Maryland has set aside $2,200,000 to fund resiliency hubs as part of its FY24 Resilient Maryland Program. These funds are specifically intended to help offset the capital costs for equipment and installation of a solar PV and battery storage system for facilities at designated "Resiliency Hub" locations. Maryland is committed to increasing the number of resilience hubs spread throughout the state.
- On April 30, 2022, the first solar-powered resiliency hub in Virginia was opened. This project was led by Partnership for Resilient Communities and the Virginia Environmental Justice Collaborative. The hub is located in the historically Black community of the Heights in Petersburg, VA. This project represented Virginia's commitment to clean energy, equity, and justice.
- The Maryland Climate Pollution Reduction Plan notes the desire to pursue funds from the U.S. Department of Energy's (DOE) grant program "Preventing Outages and Enhancing the Resilience of the Electric Grid, Grants to States and Tribes".
- The Resilient Maryland Program, administered by the Maryland Energy Administration, supports distributed energy resource (DER) system development and installation incentives to help Maryland communities and organizations plan, design, and construct microgrids, resilient facility power systems, and resiliency hubs.

## EQUITY CONSIDERATIONS

- Prioritize establishing hubs in vulnerable communities.
- Work with vulnerable communities to inform the location, design, and services of Resilience Hubs. It is essential that communities feel like resilience hubs are a trusted institution or the hubs may be underutilized. Multi-lingual engagement opportunities should be provided based on specific community demographics.
- Ensure that where battery storage is included in the resilience hub/microgrid that adequate consideration is given to environmental justice and safety concerns of the communities where these are proposed to be located.
- Ensure the resilience hubs are accessible, especially following an extreme event. Consider transit as part of the siting and services of the Resilience Hubs. This may also involve the development of mobile hubs and services.
- Specific consideration of how to provide timely support for businesses within vulnerable communities to remain open for services and solvent after a severe climate change induced storm or related power outage events.

## PROGRESS FROM 2020 – 2024

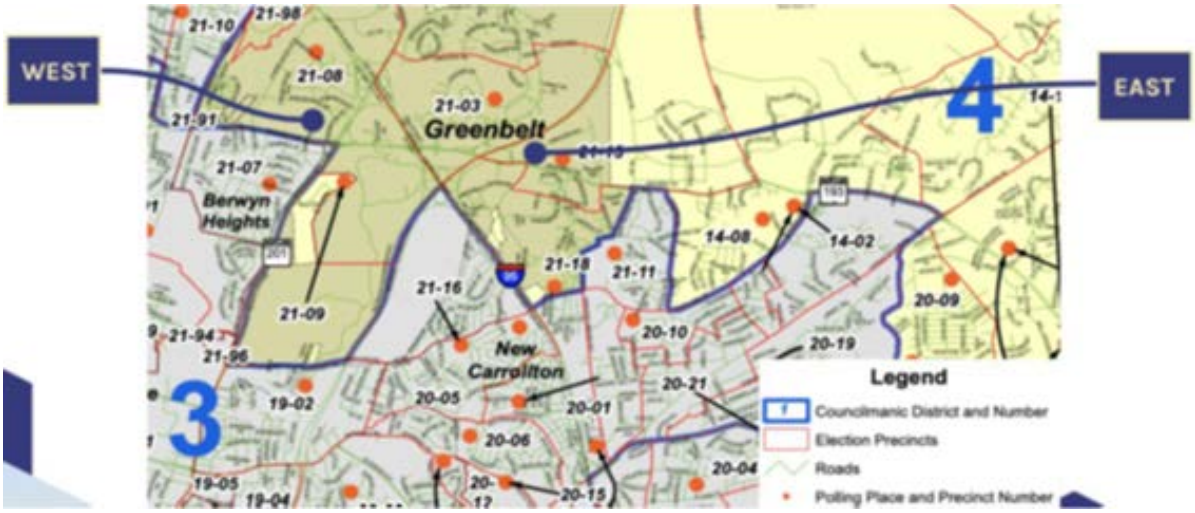
### UMD PAL Study

The University of Maryland's PALS program performed a preliminary analysis on the establishment of microgrids for two low-income communities in Greenbelt and potential locations to site resiliency hubs in proximity to those communities. PALS students selected the two hub locations depicted below due to their proximity to grid services, transportation options, and emergency care facilities.

The western microgrid could supply power to Greenbelt Middle School, just south of the microgrid and the eastern microgrid could provide power to Eleanor

Roosevelt High School. They are near hospitals and emergency response centers. Both schools are County-owned and have space to host several individuals or supplies in a disaster. Furthermore, each school could use its school bus to retrieve or drop off residents, personnel, or goods.

Figure III–7. Potential Resilience Hub Locations in Greenbelt West and East both in Council District 4
Map Source: Prince George's County Councilmanic District 4 Map, PG County Council.




Source: of UMD PAL's Program Greenbelt Solar Microgrid and Resilience Hub student analysis

**Fairmount Height Microgrid Project**

In October 2023, Housing Initiative Partnership (HIP), broke ground on a first-of-its-kind affordable homeownership development in Fairmount Heights.

The new community will feature six zero energy single-family homes, powered by Pepco's use of a BlockEnergy advanced community energy system which combines rooftop solar with local battery energy storage. In addition to powering the homes, the system will helps increase reliability, security, and resilience for Pepco's local grid. More information about the project is located at HIP's website (https://hiphomes.org/housing-development/single-family-homes/fairmount-heights/)

## KEY PERFORMANCE METRICS

- Number of Resilience Hubs
- Number of Residents potentially and actually served by the hub's emergency services (e.g., shelter, food, medical aid) during a crisis.
- Number of community outreach events organized by the hub to raise awareness about preparedness and risk reduction.

## 2025 GOALS / ACTIONS

- The CEX budget supports planning efforts of $1,405,000 to complete the underlying studies and pilot programs across the strategies, as well as build a Climate Reporting Dashboard and support public engagement (detailed in other strategies)
- The CEX budget supports up to $912,500 in grant matching funds through DoE that could leverage up to $200,000,000 in federal funds to support climate action planning and implementation
- DoE Sustainable Energy & OEM have developed a draft intitial framework for collaborating on the tasks below and expect to finalize that framework and being the assessments described in Task 1, 2 & 3 over the course of FY2025.

# PRIORITY TASKS

## Task 1 Identify and assess high priority locations for resilience hubs.

Using existing mapping resources, identify areas of social and climate vulnerability to select priority locations for Resilience Hubs. Determine how many resilience hubs will be necessary to serve the County and develop a strategy to prioritize the establishment of resilience hubs in the prioritized communities. The assessment should include the co-development of a siting criteria checklist and resource needs through a community engagement process.

| | |
|---|---|
| **Responsible Lead Entity** | OEM |
| **Secondary Partners** | DoE, DPW&T, DPIE, M-NCPPC, OCR, PGCPS, Public Safety Agencies, Municipalities |

## Task 2 Engage community in resilience hub selection and design.

In high priority locations (*Task 1*) work with communities to identify trusted institutions to site Resilience Hubs. This may be done through private partnerships. Co-develop programs and resources with communities that meet their identified needs. Hubs should be located away from flood zones or other areas vulnerable to climate impacts.

**Consideration list:**

- Ensure a community-specific approach by first engaging with residents through workshops, surveys, and other means to understand the types of support most needed and/or wanted through the hub. Partnering with trusted organizations deeply rooted in the communities they serve and considering the use of existing community centers, churches, etc., are key strategies to increase the likelihood of success.
- Identify potential partners based on the priority areas and issue Request for Proposals or a similar application process to engage community partners. Multiple partner organizations may need to be identified in each priority zone.

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| **Responsible Lead Entity** | OEM & OCR |
| **Secondary Partners** | DoE, DPW&T, DPIE, M-NCPPC, OCR, PGCPS, Public Safety Agencies, Municipalities |

## Task 3 Develop a funding and financing strategy.

Develop a funding strategy to pay for the implementation of resilience hubs, focusing on the priority locations determined in *Task 1*. This funding strategy should be developed in alignment with the financing strategies developed for Climate Resilience.

| | |
|---|---|
| **Responsible Lead Entity** | OEM |
| **Secondary Partners** | DoE, DPW&T, DPIE, M-NCPPC, OCR, PGCPS, Public Safety Agencies, Municipalities |

## Task 4 Streamline and incentivize the process for establishing of resilience hubs.

Make revisions to the permitting process that simplify and expedite Resiliency Hub-related improvements to existing buildings. If working with external partners, develop programs that incentivize the establishment and maintenance of resiliency hubs. Any upgrades made to convert existing building into resiliency hubs should meet the other goals of the CAP related to renewable energy and energy resilience.

**Consideration list:**

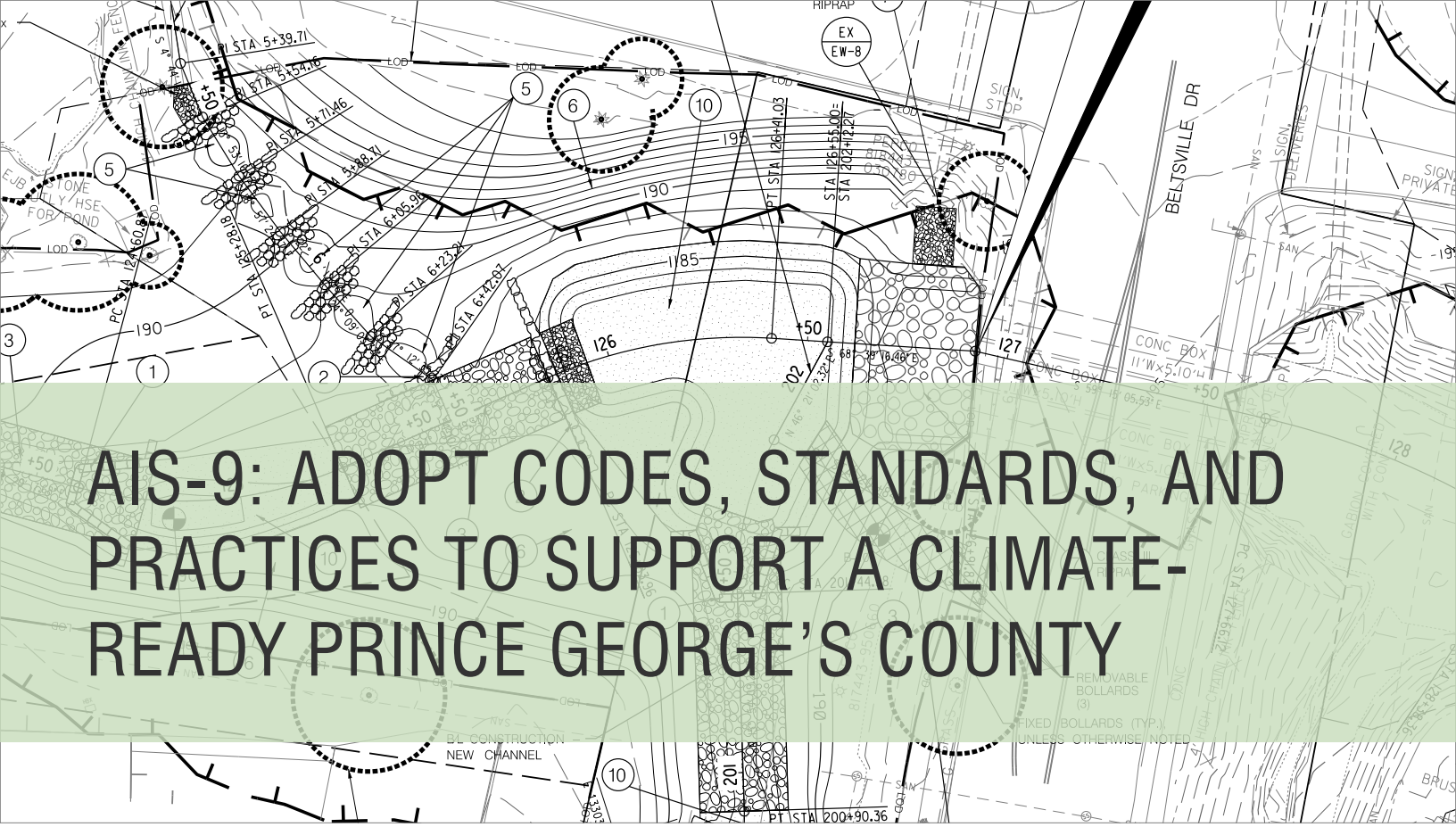
- County permitting and code compliance should prioritize streamlined permitting, technical assistance of for all Resiliency Hub-related improvements to encourage partnership participation;
- Incorporate Resilience Hubs into the County's Economic Development Plans to incubate resiliency innovation and entrepreneurship through public-private partnerships;
- Reward participating businesses or entities through public recognition and through fee and tax reduction incentives.

| | |
|---|---|
| **Responsible Lead Entity** | OEM |
| **Secondary Partners** | DoE, DPW&T, DPIE, M-NCPPC, OCR, PGCPS, Public Safety Agencies, Municipalities |

## Task 5 Establish pilot resilience hubs.

Establish pilot resilience hubs in the most needed locations to test whether new programs and policies are effective.

| | |
|---|---|
| **Responsible Lead Entity** | OEM |
| **Secondary Partners** | DoE, DPW&T, DPIE, M-NCPPC, OCR, PGCPS, Public Safety Agencies, Municipalities |




# AIS-9: ADOPT CODES, STANDARDS, AND PRACTICES TO SUPPORT A CLIMATE-READY PRINCE GEORGE'S COUNTY

## IMPLEMENTATION STRATEGY STATUS:

## UNDER DEVELOPMENT

# AIS-10: PROMOTE A CLIMATE RESILIENT FOOD SYSTEM SUPPORTED BY LOW-CARBON, CLIMATE-SMART AGRICULTURE AND SUSTAINABLE FARMING PRACTICES

## IMPLEMENTATION STRATEGY SUMMARY STATEMENT

Integrate climate change considerations into the County's local food system planning and implementation efforts, moving towards growing more food locally using climate-smart agriculture and sustainable farming practices to promote and protect soil health, increase carbon sequestration, and reduce greenhouse gas emissions. Ensure access to healthy food in the County now and in the future as natural disasters become more prevalent, and health impacts of Climate Change worsen. Ensure transit access to healthy food.

## WHY IT MATTERS

Climate shifts, characterized by high temperatures, droughts, and floods, pose significant challenges to food production, for example by changing the distribution and spread of invasive species and pests, altering typical growing seasons, and impacting soil health, water quality and availability, and sunlight availability.

Impacts to food systems in one part of the world can trigger cascading impacts, such as shortages, throughout the entire supply chain. It is therefore crucial that the County establishes greater food security by considering climate change in local food system planning efforts to establish a sustainable and reliable community food system. Actions, such as land preservation and adopting climate-smart and sustainable agricultural practices, can help connect communities to locally sourced and healthy food options.

## MAGNITUDE OF BENEFIT

Climate-resilient food systems play a crucial role in addressing climate-driven impacts, such as high temperature, droughts, and floods. These systems adopt an integrated approach that enhances food security, offers livelihood protection for farmers, and enhances ecosystem resilience by encouraging crop and livestock biodiversity and supporting pollinators and soil health. Climate-smart and sustainable agricultural practices, such as crop rotation, planting cover crops and reducing fertilizer inputs, and better management of crop residue, can improve crop nutrient density and sequester carbon, helping to reduce emissions and create improved outcomes for public health

and local economic vitality. Other practices, such as Controlled Environmental Agriculture (controlled indoor farming) practices can also help avoid climate-induced agricultural losses and reduce health and safety impacts to farm workers. These alternatives can generate new training and employment opportunities for community members and enhance local economic benefits. Through the U.S. Department of Agriculture's Resilient Food Systems Infrastructure Program, The Maryland Department of Agriculture provides over $3 million in grant funding to projects that build resilience, provide better markets to small farms and food businesses, support the development of value-added products for consumers, encourage fair prices and fair wages, and establish new and safe job opportunities. These programs can be leveraged to enhance food system resilience across the County.

## MAGNITUDE OF COST

Table III–16. Magnitude of Cost

| Annual Cost Considerations | Planning costs (years 1 – 3) | Implementation costs (years 3 – goal end) |
|---|---|---|
| Existing staff/program* | Y | Y |
| Program expansion | Y | Y |
| New program and capacity needs | Y | Y |
| Current funding within the County budget | Y | Y |
| Private Sector Involvement | Y | Y |
| Capital** | $ | $$ |
| Operations | | |
| » Salary and Benefits | $$ | $$ |
| » Consultants | $ | $ |
| » Supplies and Materials | $ | $ |

**Existing staff within SCD. Funding is from USDA NRCS, MDA, PGC & independent grants.*
***Assumes cost share with USDA NRCS, MDA & independent grant program.*

## STATE AND REGIONAL COMMITMENTS / GOALS

- The Greenhouse Gas Emissions Reduction Act-Reauthorization (2009 and the subsequent Reauthorization (GGRA of 2016) set forth a goal to achieve a 40% reduction in statewide greenhouse gas emissions by 2030. The Act also required the Maryland Department of the Environment (MDE) to develop a statewide plan (2030 GGRA Plan) to achieve this goal.
- The Climate Solutions Now Act of 2022 requires the State to reduce statewide greenhouse gas emissions by updating the reduction goal to 60% by 2031, setting a new net-zero greenhouse gas emissions goal for the economy by 2045, and implementing other projects and programs.
- By 2050, the state of Maryland plans to reduce agricultural greenhouse gas emissions by 5.7 MMTCO2e (million metric tons CO2 equivalent) by incentivizing climate-smart practices.
- The Maryland Department of Agriculture (MDA) has partnered with organizations that have supported farmers markets in accepting federal nutrition benefits (i.e. EBT). Most recently, MDA has expanded its conservation grants program to include urban and small farms across the state.

## EQUITY CONSIDERATIONS

- Allow residents to access land for non-commercial food production.
- Utilize environmental justice and food equity tools to identify key areas in the County to work to develop both commercial and non-commercial access to food.
- Revise the County's tree rebate program to create a tract to promote edible landscapes and plant fruit trees in tandem with pollinator gardens.
- Provide grants to enable "corner stores" with refrigerators, increase shelf space, and train owners to handle fresh produce to ensure that items ripen slowly and have a longer shelf life.
- Increase opportunities for students to access food-related resources and opportunities across the County, including increased access to community/school programs such as 4-H.
- Partner with organizations with a history of convening the community on issues of food equity, security and affordability- such as the Prince George's Food Equity Council.
- Build on existing recommendations of Food Security Task Force report from 2022
- Build on Existing reccomendations of Plan 2035 for food and agriculture

## PROGRESS FROM 2020 – 2024

Since 2020, the Prince George's Soil Conservation District (SCD) has completed 227 Soil Conservation & Water Quality Plans covering 18,777 number of acres for farmers and stakeholders in Prince George's County. Producers have implemented climate smart practices on over 36,000 acres. Since 2018, SCD has worked with 30-65 urban farm cooperators, annually, implementing conservation practices through its Urban Ag Conservation Program. The program has hosted and/or presented over 55 trainings, including Open Mic Nights, since 2020 on a variety of topics that introduce practices on the NRCS Climate Smart Agriculture & Forestry Activities List. Last year, the Natural Resources Conservation Service (NRCS) has added additional practices and/or payment rates to better serve the County's urban and small farms. In addition, the Maryland Department of Agriculture (MDA) added a Small Acreage Cover Crop program and Power and Water grant program to its suite of Conservation Grants. In 2023, several Prince George's County producers were awarded a Maryland's Healthy Soils Competitive grant from MDA. In 2022, ECO City Farms, M-NCPPC, SCD, the Food Equity Council, and The Capital Market of 20743 have been working strategically to establish an Urban Farm Incubator (UFI) at Watkins Regional Park. Currently, there are 10 farm businesses with 15 farmers growing food, flowers and herbs on nine, half-acre plots. Several farmers are growing produce for the Capital Area Food Bank. In addition to addressing food security, the project has implemented a variety of climate-smart conservation practices in the common areas of the site, as well as on each plot by individual farmers. Farmers have brought a variety of soil health practices to the UFI, but have learned about additional practices that have the potential to reduce GHG emissions from ECO City Farms, SCD, NRCS, MDA and other farm stakeholders engaged at the UFI.

In 2015, the Prince George's County Planning Department released a food system study, "Healthy Food for All Prince Georgians," describing food access-realted health disparities. The report showed that residents living in the most urban areas and inside the Capital Beltway have much higher rates of diet-related illnesses relative to people living in other parts of the County. Individuals in these communities also have lower income levels and higher rates of food insecurity. The Planning department also supported the "2018 Healthy Food Policy Project " published by Prince George's County Food Equity Council, and in 2021 in partnership with UMD-PALS, M-NCPPC also published "Food Access and Equity in Prince George's County" which focused on determining appropriate definitions of food access, food security, and food


equity and conducted anArcPro spatial analysis of Prince George's County to produce maps identifying healthy food priority areas. This report provided policy recommendations to the M-NCPPC and outlines further steps for future capstone groups.

The Prince George's County Council established the Prince George's County Food Security Task Force, with adoption of Council Resolution CR-62-2020 and its report submission was extended by CR-70-2021, to address issues related to the demand and supply of healthy food, food health connections, school meals, and overall food security in Prince George's County. The goal was to identify challenges and opportunities and provide recommendations for creating a healthy, equitable, and sustainable food system that ensures every Prince Georgian has access to nutritious, affordable, sustainably grown, safe and culturally appropriate food. Such issues have been exacerbated by the COVID-19 pandemic and its impact on Prince George's County's residents, institutions and businesses.

The Food Security Task Force completed its Final Report and Recommendations in December 2021 and submitted it to the County Council in January 2022. The Food Security Task Force offered 11 primary recommendations - four (4) Foundational ones and seven (7) General ones identified in the Final Report. These recommendations include:

- Create and fund a Prince George's County Food Security Office;
- Gather, analyze, and use data sources and systems to inform and drive County government food security decisions;
- Maximize resident participation in federal nutrition assistance programs and school meals;
- Develop a master communication strategy for food security, resilience, and emergency preparedness;
- Plan for future food security disruptions by developing an emergency food security plan that integrates food system experts into existing emergency management operations;
- Increase access to bulk food purchasing, infrastructure, and resources for food assistance providers;
- Co-locate food security and social safety net services and create closed-loop referral systems;
- Improve transportation options for residents to access healthy food retailers and providers;
- Leverage state and regional partners for » cross-jurisdictional food systems planning, coordinated communication, and infrastructure development;
- Provide land access, infrastructure, and resources to help agriculture flourish; and
- Continue to provide and expand market incentives and support to healthy food retailers of multiple sizes in target communities.

## KEY PERFORMANCE METRICS

- # of Climate Smart Agriculture & Forestry (CSAFs) and Best Management Practices (BMP) installed
- # of Acres covered by Conservation BMPs
- # of Acres covered by Soil Conservation and Water Quality Plans
- # of Acres of agriculture Land under easement
- # of Soil Conservation and Water Quality Plans written
- # of Soil Conservation and related training sessions
- # of Students engaged through Envirothon
- # of County farmers and producers engaged through outreach and education through both SCD, UMD Extension, and DoE via the Smart Commodities Program
- # of Farmers Markets and Groceries selling local and/or resilient food
- % of County in a food swamp or food desert
- % of County residents coverd by resilent food plan


## 2025 GOALS / ACTIONS

DoE, SCD, and the Prince George's County Climate-Smart Local Producers Pilot Program grant partners will continue to roll out the program. DoE will finalize hiring the program manager dedicated to the program by the start of FY25. This position will also help support and advise on the facilitation of integrating of climate into local food system efforts. The program's incentive program will be open for applications by late summer of 2024. DoE in collaboration with SCD, will develop a solicitation to assess low-carbon resilient food system opportunities for Prince George's County. Additionally, a solicitation for developing a Prince George's County climate-smart commodities marketing plan will also be developed and released in FY25. DoE and SCD will continue to evaluate and crosswalk existing programs, such as the Rain Check Rebate via the Community Garden Grant, to better leverage in support of local food production.

# PRIORITY TASKS

## Task 1 Assess low-carbon resilient food system opportunities for Prince George's County.

Develop and release a solicitation to perform a Prince George's County low-carbon resilient food system study.

**Consideration list:**

- Evaluate the Impacts of climate change on Prince George's County food systems.
- Build on the foundational and general recommendations of the 2022 Food Security Task Force Report.
- Identify opportunities for integrating climate resilience into local food system efforts such as:
  - Identification of climate-smart practices that promote soil health and improved water quality (e.g., no-till, cover crop, mulching, etc.).
  - Other agriculture adaptation strategies as outlined by the Climate Vulnerability Assessment for Maryland Agriculture.
  - Potential code of ordinance and zoning change.
  - Agrivoltaic farming practices.
  - Local agriculture carbon sequestration benefits.
  - Partnership opportunities.
  - Internal procurement policies to support local food production (e.g., Good Food Purchasing Program).
  - Support a feasibility study for an Agriculture & Food Security Innovation Center.
- Pursue opportunities to align with strategies outlined by the Maryland Climate-Smart Agricultural Project.
- Prioritize funding opportunities for projects and programs that align food system planning with climate action goals.
  - For example, ways to utilize COVID-19 relief and infrastructure funding to support climate-smart and sustainable agriculture and nutrition assistance.

| | |
|---|---|
| **Responsible Lead Entity** | SCD/DoE |
| **Secondary Partners** | UMD Extension, M-NCPPC, Office of Homeland Security/OEM, Food Equity Council |
| **Special Considerations** | Coordinate with the Prince George's Soil Conservation District to develop the solicitation's scope and include as part of the bid evaluation and award process for all submitted proposals.<br><br>Consider aligning scope of work with overarching goals of the Prince George's County Climate-Smart Local Producers Pilot Program. |

## Task 2 Establish an agriculture/food and climate staff position.

Establish a new full-time agriculture/food and climate staff position within County government that works with the Climate Officer to facilitate integration of climate resilience into local food system efforts, beginning with supporting the Climate Centric Commodities program, and expanding to support broader efforts.

**Duties to be included in either the climate and agriculture/food staff position and/or Climate Officer position:**

- Leads the Climate-Smart Commodities program for DoE and other DoE efforts on food and climate.
- Supports SCD, DoE, and other Agencies in coordination between agencies and outside groups on food and farm issues.
- Supports program efforts with Office of Homeland Security (OHS), Office of Emergency Management (OEM), and if developed in the future, the Office of Food Security (OFS) and through OEM coordinates with FEMA and MEMA on climate-related emergency food assistance planning.
- Coordinates with and supports the DCAO for Economic Development and entities that report through her in the development of food-based economic development efforts and circular food system.
- Supports securing applicable government grants and funding.

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| **Responsible Lead Entity** | DoE/CEX Office |
| **Secondary Partners** | Office of Homeland Securty/Office of Emergency Management, Prince George's Soil Conservation District, DCAO for Economic Evelopment, Economic Development Corporation, Revenue Authority, Prince George's County Public Schools, Department of Social Services, Food Equity Council |
| **Special Considerations** | Benefits of sustainable local fresh food production supports healthy food choices, helps achieve the County's GHG emission reductions goals, and encourages growth of County-based business dedicated to sustainable practices. This will require specialized knowledge and dedicated resources to best leverage the transformational economic opportunities presented by local food production in the face of climate change. |
| **Status** | In Progress |

## Task 3 Integrate climate resilience into local food system efforts.

Integrate climate-resilient considerations into the County's food system planning and support efforts by adopting recommendations from the low-carbon resilient food system study (*Task 1*).

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| **Responsible Lead Entity** | Will be determined by study |
| **Secondary Partners** | Will be determined by study |
| **Special Considerations** | Align recommendations to encourage development and implementation of innovative agriculture practices (aquaculture, hydroponics, etc.) that are scalable for urban farmers and small local food production. |

## Task 4 Change County procurement policies to support local food production.

Establish a baseline and target for reducing emissions associated with the County's public food purchasing. Adopt strategies from the low-carbon resilient food system study as it relates to the County's food procurement policies.

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| **Responsible Lead Entity** | OCS Procurement Office |
| **Secondary Partners** | County Agencies |
| **Special Considerations** | Prioritize small County-based businesses which promote farm to table. |

## Task 5 Encourage and support local food production through incentives and programs.

Encourage and support local food production through the development of new and expansion of existing local agricultural production incentive programs.

**Consideration list:**

- Continue funding of an Ag Marketing position to support and promote County agriculture. Prioritize the engagement of this position with all County agencies touching agriculture and food systems.
- Continue to support, expand, and leverage existing agricultural conservation programs and partnerships in the County that incentive farmers to implement climate-smart practices (i.e. NRCS Financial Incentive Programs, MDA Conservation Grants Program.)
- Prioritize supporting farm-to-table in urban areas by the establishment of incentives for businesses that make space available for markets in urban areas. Special and additional incentives should be provided for marketplace locations that are pedestrian friendly and with easy access to mass transit and/or biking trails.
- Promotion of farm-to-table producers at County-sponsored events.
- Collaborating on the development of a Prince George's County Land Trust to transfer, purchase, or lease land from the County, government surplus land, or other private landowners for agricultural use. Land Trust should also have preferential access to available government surplus land transfers.

» Prioritize adopting policy and code to encourage and support urban land conversion to urban farmland (e.g., conversion of vacant or paved County surplus lots and "paper roads" for agricultural production or vacant County warehouse space for Controlled Environmental Agriculture.) To protect public health and support land conversion projects, additional technical support and funding should be made available to perform any recommended or required remediation when utilizing surplus or vacant urban land for urban farmland.

» Prioritize dedicated funding and budget allocated for incentives and technical assistance through SCD and its partners for farmers implementing climate-friendly practices that promote soil health and improved water quality.

» Prioritize offering grants and rebates for community gardens and residents who plant noninvasive fruit trees and edible landscapes.

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| **Responsible Lead Entity** | EDC/OCS/OFS |
| **Secondary Partners** | DoE, SCD, M-NCPPC, OCS, DPIE |

## Task 6 Review and if Required, Revise Prince George's County code of ordinance and applicable zoning regulations to support a climate resilient food system.

Based on the Prince George's County low-carbon resilient food system study, create, support, and adopt changes to County code to facilitate and encourage the implementation of climate-resilient food system.

**Consideration list:**

» Prioritize the review and adoption of recommendations of the December 2014 Prince George's County Zoning Ordinance and Subdivision Regulations Rewrite Section IV.B. "Support Preservation and Protection of Rural and Agricultural Lands" and Section V.E. "Open Space."

» Evaluate and recommend land use policy and code changes to support agrivoltaics and prevent conversion of farmland and natural resource areas to locate renewable energy projects.

» Evaluate and specify within the land use tables all land use zones that will allow urban agriculture to ensure legal protection for agricultural land use, provide greater clarity of agricultural permit requirements based on zone, and minimize fees where permits may be required.

» Promote rainwater harvesting and onsite greywater reuse to irrigate and reduce onsite runoff.

» Prioritize code and zoning changes to allow onsite sale of farm produce without triggering commercial parking and additional facility requirements.

» Prioritize zoning and code revisions for limited flex zoning for urban and rural farming (restaurant, produce stands).

» Evaluate and recommend best practices to support utilization of utility easements for dedicated community gardens and composting.

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| **Responsible Lead Entity** | M-NCPPC |
| **Secondary Partners** | SCD, DoE, OCS, DPIE |

## Task 7 Expand community education and outreach on food and climate change.

Expand and promote community education and outreach to message how local food production is critical to ensuring long-term community-wide climate resilience; align all outreach and messaging efforts with the County's Food Security Task Force nutrition security recommendations.

**Consideration list:**

- Prioritize educating County stakeholders on what actions can be taken every individual or family to reduce the carbon footprint of food choices and support sustainable local farms and a circular food system.
- Promote, incentivize, and encourage urban farmers to obtain a nutrient management, soil conservation and water quality plan.
- Promote public awareness of agricultural technical and financial assistance programs.
- Prioritize supporting the Envirothon learning program for high school students.
- Prioritize integrating climate resiliency education for the following County-sponsored education and training resources for local food production and farming:
  - Prince George's County Community College Agricultural/Urban Farming curriculum in partnership with ECO City Farms.
  - PGCPS Career and Technical Education program under Environmental, Agricultural, and Natural Resources.
  - Maryland Extension Service-Master Gardener Program.
- Prioritize allocation of additional funding, staffing, and resources to expand the Prince George's County Master Gardener Program, community garden mini-grants, and the Prince George's County Agriculture Resource Advisory Commission.

| | |
|---|---|
| **Responsible Lead Entity** | DoE/SCD |
| **Secondary Partners** | UMD Extension, Food Equity Council, OFS |
| **Special Considerations** | The Prince George's County Master Gardner Program serves as gateway for residents to expand their knowledge of sustainable gardening and local food production. It is an effective program that should be expanded to specifically support urban farmers and sustainable food production. Currently, the County has only one FTE position for this program. Additional budget is recommended to expand program capacity and support additional staffing for program work. |

## SECTION III ADAPTATION ENDNOTES

1 FEMA. Protect Your Property From Flooding Brochure. 2023. Protect Your Property From Flooding (fema.gov)

2 EPA Launches Let's Talk About Heat Challenge to Raise Awareness of Extreme Heat Risks | US EPA

3 Land | Free Full-Text | “The Urban Poor and Vulnerable Are Hit Hardest by the Heat”: A Heat Equity Lens to Understand Community Perceptions of Climate Change, Urban Heat Islands, and Green Infrastructure (mdpi.com)

4 Moyce, Sally C., and Marc Schenker. "Occupational Exposures and Health Outcomes Among Immigrants in the USA." Current Environmental Health Reports 4, no. 3 (September 2017): 349–54. https://doi.org/10.1007/s40572-017-0152-1.

5 **Resilience Hubs** are community-serving facilities augmented to support residents and coordinate resource distribution and services before, during, or after a natural hazard event. They leverage established, trusted, and community-managed facilities that are used year-round as neighborhood centers for community-building activities. Designed well, Resilience Hubs can equitably enhance community resilience while reducing GHG emissions and improving local quality of life. They are a smart local investment with the potential to reduce burden on local emergency response teams, improve access to health improvement initiatives, foster greater community cohesion, and increase the effectiveness of community-centered institutions and programs.
**Emergency Shelters** are a place for people to live temporarily when they cannot live in their previous residence due to damage or risk of damage from a natural hazard event. A resilience hub may be an emergency shelter, but it has additional value to community resilience and emergency response beyond just shelter.
A **Cooling Center** (or "cooling shelter") is a location, typically an air-conditioned or cooled building that has been designated as a site to provide respite and safety during extreme heat. This may be a government-owned building such as a library or school, an existing community center, religious center, recreation center, or a private business such as a coffee shop, shopping mall, or movie theatre. Some counties have set up cooling sites outdoors in spray parks, community pools, and public parks. Sometimes temporary cool spaces are constructed for events such as a marathon or outdoor concert. A resilience hub may be a cooling hub, but it has additional value to community resilience and emergency response beyond just cooling.
A **Microgrid** is a small network of electricity users with a local source of supply that is usually attached to a centralized national grid but is able to function independently. Resilience Hubs are often on a microgrid- but microgrids can exist without resiliency hubs, and hubs without microgrids.
An **Emergency Operations Center** (EOC) is a physical or virtual location from which leaders of a jurisdiction or organization coordinate information and resources to support incident management activities (on-scene operations). In some communities the EOC is physically hosted in a resilience hub, in others it is fully virtual, or at a public building or location.

6 Urban Sustainability Directors Network. nd. https://resilience-hub.org/

7 FEMA. Notice of Funding Opportunity for Fiscal Year 2022 Building Resilient Infrastructure and Communities Program. 2022. Factsheet. fema_fy22-bric-nofo-fact-sheet_08122022.pdf

8 Bloomberg Cities Network, John Hopkins University. How can municipalities fund resilience hubs? 2023. How can municipalities fund resilience hubs? | Bloomberg Cities (jhu.edu)

# IV. NEXT STEPS

The Task Force will reconvene in the Spring of 2024 to discuss next steps. Next step may include forming new work groups to finish development of the following Implementation Strategies:

AIS-2, AIS-3, A-9, MIS-1, MIS-11

Once the process for finishing the development of the remaining Implementation Strategies is agreed upon, a work group will be established with the goal to finalize all remaining Implementation Strategies by April of 2025. In April of 2025, the CAISP as a living document will be revised and republished to include the following Implementation Strategies:

AIS-2, AIS-3, A-9, MIS-1, MIS-11

On an annual basis, the CAISP will be reviewed for any needed updates, revisions, or additional strategies. Annual updates are recommended for the CAISP to stay relevant, evolve as our climate changes, and respond to state and federal mandates.

In parallel to the work to finish the remaining Implementation Strategies, the following tasks will be considered ongoing:

- Identifying the magnitude of cost for the Implementation Strategies & Tasks.
- Utilizing FY2025 funded consultant and expert contracts to support lead agencies to develop roadmaps to achieve the assigned Implementation Strategies.
- Performing ongoing updates to the Climate Action Implementation Dashboard- including the initial static dashboard release in April 2024, interactive capacity release in June 2024 and ongoing data and accomplishment reporting.
- Planning for a Climate Action Summit for County Leadership to deepen understanding of their role in Climate Resilience (FY25 or FY26, within 12-18 months after completion of the initial implementation plan).
- Hiring a Prince George's Climate Officer.
- Developing a version 2.0 of the fiscal budget review process to support embedding climate actions within agency and related entities fiscal operational and programmatic budgets.

# PHOTO SOURCES

| Page # | Location | Description | Source |
|---|---|---|---|
| Cover | Left column | Electric vehicle charger in Hyattsville | City of Hyattsville |
| Cover | Middle column, top | Arbor Day Every Day group planting a tree | Prince George's County Department of the Environment |
| Cover | Middle column, bottom | The Bus | Prince George's County Department of Public Works & Transportation |
| Cover | Right column, top | People learning about soil at a farm | Prince George's Soil Conservation District |
| Cover | Right column, upper middle | A great blue heron flies above the Anacostia River | Chesapeake Bay Program, Flickr \| Link |
| Cover | Right column, lower middle | Calverton Chanel Stream Restoration Plan | Prince George's County Department of Public Works & Transportation |
| Cover | Right column, bottom | Solar panels at Bowie State University Student Center | Bowie State University |
| 1 | Right column, top | Flooding in Brentwood, MD from the September 2020 flash flood event | Prince George's County Department of Public Works & Transportation |
| 6 | Right column, top | Front cover of the 2022 Climate Action Plan | Prince George's County Climate Action Commission |
| 11 | Background | Route One Summit Group meeting | Environmental Finance Center at The University of Maryland |
| 12 | Left column, top | Adults in classroom | Environmental Finance Center at The University of Maryland |
| 12 | Right column, top | NASA staff teaching earth science lesson to middle school students at the Goddard center in Greenbelt | NASA Goddard Space Flight Center, Flickr I Link |
| 15 | Bottom | Prince George's County Rain Check Rebate Contractor Training Day 1 | Low Impact Development Center, Inc. |
| 21 | Background | Aerial of subdivision near forest in Prince George's County | Chesapeake Bay Program, Flickr \| Link |
| 22 | Left column, top | Fordham St. stream restoration - before | Prince George's County Department of the Environment |
| 22 | Right column, top | Fordham St. stream restoration - after | Prince George's County Department of the Environment |
| 31 | Background | Watershed education at Festival del Rio in Bladensburg | Chesapeake Bay Program, Flickr \| Link |
| 32 | Right column, top | Students holding outreach signs | The Clean Water Partnership |
| 41 | Background | Solar panels on top of College Park DPW | Environmental Finance Center at The University of Maryland |
| 42 | Background | Electricfy America EV Charging Stations | Ken Fields, Flickr I Link |
| 44 | Right column, middle | EV Charging and PHEVs at County office building | Prince George's County |
| 59 | Right column, bottom | Electric Vehicle charging station in Bowie, MD | Environmental Finance Center at The University of Maryland |
| 54 | Bottom | Excerpt from DPW&T Sustainability Report 2021 | Prince George's County DPW&T |

| Page # | Location | Description | Source |
|---|---|---|---|
| 55 | Background | Exit 15A, Largo, Interstate 495, Maryland | Ken Lund, Flickr \| Link |
| 56 | Right column, top | Metro train at New Carrollton Metro Station | Ben Schumin, Flickr \| Link |
| 57 | Right column, top | Illustration of green skyline | Maryland Department of Transportation |
| 60 | Background | Worker weatherizing home in Prince George's County | Prince George's County |
| 61 | Right column, top | Infographic of energy efficient home | Inside Climate News |
| 67 | Background | Solar panels on top of College Park DPW | Environmental Finance Center at The University of Maryland |
| 68 | Right column, bottom | Infographic of smart home energy management system (sHEMS) with renewable energy sources (RES) and electric vehicles (EV) | Mingfu Li 1,2, Guan-Yi Li 1, Hou-Ren Chen 1 and Cheng-Wei Jiang, Creative commons \| Link |
| 75 | Background | Sorting recycling at County Materials Recycling Facility | Prince George's County Department of the Environment |
| 78 | Bottom | Organics composting at the County's Western Branch Composting Facility | Maryland Environmental Services |
| 81 | Bottom | Bulk waste processing at Brown Station Road Landfill | Prince George's County Department of the Environment |
| 82 | Background | Forest in Greenbelt Park | Chesapeake Bay Program, Flickr \| Link |
| 85 | Background | Flooding in Prince George's County | Prince George's County Department of the Environment |
| 86 | Background | Screenshot of COG transit focus area map | Metropolitan Washington Council of Governments |
| 87 | Background | Flood control structure | Prince George's County DPW&T |
| 91 | Bottom | Participants at a Sustainable Maryland Certified event | Environmental Finance Center at The University of Maryland |
| 92 | Background | Transit riders | Elvert Barnes, Flickr I Link |
| 98 | Background | Solar Panels on Brentwood Town Hall | Environmental Finance Center at The University of Maryland |
| 101 | Top | Screenshot of potential resilience hubs in Greenbelt | Prince George's County Councilmanic District 4 Map, PG County Council |
| 104 | Background | Calverton Chanel Stream Restoration Plan | Prince George's County Department of Public Works & Transportation |
| 105 | Background | 2014 Homegrown School Lunch Week Kickoff at Gwynn Park High School | Maryland Department of Agriculture, Flickr \| Link |
| 105 | Left column, top | 2014 Homegrown School Lunch Week Kickoff at Gwynn Park High School | Maryland Department of Agriculture, Flickr \| Link |
| 109 | Right column, top | Cooking demonstration - 2014 Homegrown School Lunch Week Kickoff at Gwynn Park High School | Maryland Department of Agriculture, Flickr \| Link |
| 116 | Right column, top | A road through forested land in Upper Marlboro, MD | Chesapeake Bay Program, Flickr \| Link |

# GLOSSARY AND ACRONYMS

## GLOSSARY

The table below provides definition of key terms used in the Plan.

| Term | Definition |
|---|---|
| Activity Centers | Vibrant community hubs where people shop, work, meet, relax, and often live. They range in size, from local neighborhood shopping strips to centers that include universities and major regional shopping malls. |
| Adaptation | Steps taken to adjust natural or human systems to the expected impacts of climate change. This generally involves either reducing vulnerability to the harmful effects of climate change (i.e., adopting practices to avoid harm from more intense weather events or sea level rise) or making the most of potential beneficial opportunities associated with climate change (i.e., longer growing seasons). |
| Carbon Offset | A reduction in GHG emissions or an increase in carbon storage that is used to compensate for emissions that occur elsewhere. |
| Carbon Sinks | Any process or mechanism that removes carbon dioxide from the atmosphere. A given carbon pool can be a sink, during a given time interval, if carbon inflow exceeds carbon outflow. |
| Climate Action Plan | A detailed and strategic framework for measuring, planning, and reducing greenhouse gas (GHG) emissions and related climatic impacts. Plans generally focus on those activities that can achieve the relatively greatest emission reductions in the most cost-effective manner and may also include additional components such as resilience strategies, clean energy targets, and economic and social goals. |
| Cost of Inaction | The likely social, environmental, and economic costs associated with not deploying necessary policies, strategies, and technologies to mitigate and adapt to climate change. |
| Ecosystem Services | Benefits people obtain from ecosystems, including the provision of food, fresh water, fuel, fiber, and other goods; regulation of climate, water, and pollution; support of soil formation and nutrient cycling; and educational, aesthetic, and cultural heritage values as well as recreation and tourism. |
| Environmental Justice | The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. |
| Exposure | The presence of people, livelihoods, species or ecosystems, environmental services and resources, infrastructure, or economic, social, or cultural assets in places that could be adversely affected by a hazard. |
| Fee-in-lieu | A payment of money in place of meeting all or part of a performance standard required by an ordinance. |
| Floodplain | Area along a stream, river, drainage course, lake, or pond that has a 1% or greater probability of flooding in any given year |
| Forest | Biological community dominated by trees and other woody plants (including plant communities, understory, and forest floor) covering a land area which is 10,000 square feet or greater, and at least 50 feet wide. Areas that have at least 100 trees per acre with at least 50% of those trees having a two-inch or greater diameter at 4.5 feet above the ground. |

## GLOSSARY (CONT.)

| Term | Definition |
|---|---|
| Green Infrastructure | Strategically planned and managed network of natural lands, working landscapes, and other open spaces that conserves ecosystem value and functions and provides associated benefits to human populations. |
| Greenhouse Gas Inventory | A list of emission sources and the associated emissions quantified using standardized methods. |
| High Hazard Dam | A classification standard for any dam whose failure (breach) or mis-operation (unscheduled release) will cause loss of human life and significant property destruction. |
| Marlboro Clays | A geologic formation that outcrops in Prince George's County, Maryland. A continuous stratum of thick silvery-gray to pale-red plastic clay that is highly susceptible to slope failure. As overlying permeable sediment becomes heavily saturated with infiltrating precipitation, the frictional resistance lowers along the contact with the low permeability Marlboro Clay producing a slide surface which could potentially lead to slumps and earthflows. This occurrence is particularly numerous in south-western and east-central Prince Georges County. |
| Metric tons of carbon dioxide equivalent | Unit of measurement in this tool. The unit "CO2e" represents an amount of a GHG whose atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO2), based on the global warming potential (GWP) of the gas. |
| Microgrid | A self-sufficient energy system that serves a discrete geographic footprint, such as a college campus, hospital complex, business center, or neighborhood. |
| Mitigation | Steps taken to limit the magnitude and stabilize the rate of climate change. This generally involves reducing the flow of heat-trapping greenhouse gases into the atmosphere, either by reducing sources of these gases (e.g., improving energy efficiency and switching away from fossil fuels) or enhancing the "sinks" that accumulate and store these gases (e.g., forests and soil). |
| Nature-based solutions | Actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits. |
| Net-Zero | Strategies, approaches, and technologies to consume only as much energy as produced, achieve a sustainable balance between water availability and demand, and eliminate solid waste sent to landfills. |
| Regenerative Agriculture | All forms of agricultural practice that actively restore soil quality, biodiversity, ecosystems health, water quality while producing sufficient food of high nutritional quality. |
| Resilience | The capacity of a community to anticipate, prepare for, and respond to climate change to thrive and prosper. This will require communities to adopt a continuous process of learning, leading, and implementing both mitigation and adaptation strategies to ensure the long-term health, safety, and financial well-being of its residents. |
| Resilience Hub | Resilience Hubs are community-serving facilities augmented to support residents and. coordinate resource distribution and services before, during, or after a natural hazard event. |
| Risk | The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions in a given area and time period. |

## GLOSSARY (CONT.)

| Term | Definition |
|---|---|
| Sequestration | The process of capturing and storing atmospheric carbon dioxide. It is one method of reducing the amount of carbon dioxide in the atmosphere with the goal of reducing global climate change. |
| Urban Heat Island | Heavily developed areas which experience higher temperatures than surrounding rural areas. Urban heat islands typically feature less tree canopy cover and green space, and more impervious surfaces. |
| Urban Tree Canopy | Refers to the layer of tree leaves, branches, and stems that provide tree coverage of the ground when viewed from above. |
| Vulnerability | The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. Vulnerability is determined by a combination of the exposure, sensitivity, and adaptive capacity of the city's assets, populations, and neighborhoods. |
| Vulnerable Communities | Groups and communities at a higher risk and increased sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts because of the barriers they experience to social, economic, political, and environmental resources as well as limitations due to illness or disability. |
| Weatherization | The practice of protecting a building from weather and making a building's envelope more energy efficient. |

## ACRONYMS

| | |
|---|---|
| AWS | Alternative Work Schedule |
| BAU | Business As Usual |
| C-PACE | Commercial Property Assessed Clean Energy |
| C&D | Construction and Demolition Debris |
| CAC | Climate Action Commission |
| CAP | Climate Action Plan |
| CCA | Community Choice Aggregation |
| CEX | County Executive |
| CH4 | Methane |
| CIP | Capital Improvement Program |
| CO2 | Carbon Dioxide |
| CTE | Career and Technical Education Program |
| DBH | Diameter at Breast Height |
| DCFC | Direct Current Fast Charger |
| DHCD | Maryland Department of Housing and Community Development |
| DMV | District of Columbia, Maryland, Virginia Region |
| DNR | Maryland Department of Natural Resources |
| DoE | Department of the Environment |
| DPIE | Department of Permitting, Inspections, and Enforcement |
| DPW&T | Department of Public Works & Transportation |
| EPA | U.S. Environmental Protection Agency |
| EV | Electric Vehicle |
| EVSE | Electric Vehicle Supply Equipment |
| FY | Fiscal Year |
| GHG | Greenhouse Gas |
| GI | Green Infrastructure |
| GIS | Geographic Information Systems |
| HA | Housing Authority |
| HBCU | Historically Black Colleges and Universities |
| HCD | Housing and Community Development |
| HD | Health Department |
| HFC | Hydrofluorocarbon |
| HUD | U.S. Department of Housing and Urban Development |
| HVAC | Heating, Ventilation, and Air Conditioning |
| IPCC | Intergovernmental Panel on Climate Change |
| kWh | Kilowatt Hour |

## ACRONYMS (CONT.)

| | |
|---|---|
| LEED | Leadership In Energy and Environmental Design |
| LIEEP | Low-Income Energy Efficiency Program |
| LPG | Liquid Petroleum Gas |
| M-NCPPC | Maryland-National Capital Park and Planning Commission |
| MCCC | Maryland Commission on Climate Change |
| MDE | Maryland Department of Environment |
| MEA | Maryland Energy Administration |
| MEP | Maximum Extent Possible |
| MHDV | Medium- and Heavy-Duty Vehicle |
| MLS | Memorial Library System |
| MSW | Municipal Solid Waste |
| MTCO2e | Metric Tons of Carbon Dioxide Equivalent |
| MWCOG | Metropolitan Washington Council of Governments |
| MWh | Megawatt Hour |
| NBS | Nature-Based Solutions |
| NGO | Non-Government Organization |
| NOAA | National Oceanic and Atmospheric Administration |
| OCF | Organics Composting Facility |
| OCS | Office of Central Services |
| OEM | Office of Emergency Management |
| OHR | Office of Human Resource Management |
| PAYT | Pay-As You-Throw |
| PGCC | Prince George's Community College |
| PGCPS | Prince George's County Public Schools |
| PHEV | Plug-in Hybrid Electric Vehicles |
| PPA | Power Purchase Agreement |
| PV | Photovoltaic |
| PZEV | Partial Zero-Emission Vehicles |
| R-PACE | Residential Property Assessed Clean Energy |
| RA | Revenue Authority |
| REAG | Resident Experts Advisory Group |
| RDA | Redevelopment Authority |
| RFP | Request For Proposal |
| RNG | Renewable Natural Gas |
| RPS | Renewable Portfolio Standards |
| SCD | Soil Conservation District |
| SOV | Single Occupancy Vehicle |
| SWM | Stormwater Management |
| SWMM | Stormwater Management Modeling |
| TAP | Telework Arrangement Program |
| TCP | Tree Conservation Plan |
| TPB | National Capital Region Transportation Planning Board |
| UMD | University of Maryland |
| VMT | Vehicle Miles Traveled |
| WMATA | Washington Metropolitan Area Transit Authority |
| WSSC | Washington Suburban Sanitary Commission |
| WTE | Waste-To-Energy |
| ZEV | Zero-Emission Vehicles |

# APPENDICES

| Appendix | Contents |
|---|---|
| ISP-1 | Climate Action Implementation Strategies Table |
| ISP-2 | CAP Priority Recommendations Transition into Climate Action Implementation Strategies |

**Supporting Documents from the Prince George's County CAP:**

| Appendix | Contents |
|---|---|
| A-1 | GHG Inventory |
| B-1 | Climate Risk and Vulnerability Assessment Report |

Note: The GHG Inventory (A-1) and Climate Risk and Vulnerability Assessment Report (B-1) included herein are extracted from the Final Draft Climate Action Plan that was released January 15, 2022, and are provided for reference.

# ISP-1: CLIMATE ACTION IMPLEMENTATION STRATEGIES TABLE

| ID | Implementation Strategy Title | CAP Priority Recommendation Title |
|---|---|---|
| **Leadership Implementation Strategies** | | |
| LIS-1 | Build internal capacity to plan and implement climate action | Task 1: Adopt the draft CAP, and develop a Climate Action Implementation Plan. |
| | | Task 2: Commit to Climate Resilience and Climate Action. |
| | | Task 3: Hire a Climate Officer in County Executive's Office. |
| | | Task 4: Develop a Climate Commission/Climate-Ready Leadership Team so that members of the public, private sector, and non-profit sector, community-based organizations, municipalities, will have an avenue to advise the County Executive's Climate Action Strategies. |
| | | Task 5: Establish an internal County structure to sustain climate action, such as a "Climate Cabinet" or "Inter-Agency Task Force." |
| | | Task 6: Deliver/host a Prince George's County Climate-Ready Leadership Summit in FY2025 or FY2026. |
| | | Task 7: Hire and develop environmental justice and climate competence in County staff. |
| LIS-2 | Integrate climate resilience criteria into long-range County plans, policies, and CIP projects and ensure there is a sustainable source of funding to implement these climate implementation strategies | Task 1: Develop a core set of climate resiliency criteria and a methodology for evaluating climate impacts/benefits and equity impacts/benefits of operational and CIP projects. |
| | | Task 2: The internal "Climate Cabinet" or "Inter-Agency Task Force" (described in Task 4 of Leadership Strategy 1) will integrate climate mitigation and adaptation into all County plans, policies, and CIP and operational budgets and programs. |
| | | Task 3: Identify opportunities to secure new financing for climate resilience projects, and determine a structure to most effectively obtain that financing. |
| | | Task 4: Apply sustainable funding mechanisms and structure to prioritize climate action. |
| | | Task 5: Lead by Example by reducing the environmental impacts of day-to-day County operations through initiatives to transition to renewable energy, decrease greenhouse gas emissions, increase energy efficiency, decrease vehicle-miles traveled, and decrease waste. |

| ID | Implementation Strategy Title | CAP Priority Recommendation Title |
|---|---|---|
| LIS-3 | Transparency, equitable engagement, and climate information | Task 1: Meaningfully engage community members in Climate implementation at the County government level and in communities. |
| | | Task 2: Develop climate resilience goals & metrics. |
| | | Task 3: Track climate resilience methods on a public dashboard. |
| | | Task 4: Track climate implementation progress and report annually. |
| | | Task 5: Provide information and resources to the public to build awareness of climate impacts and to support community members' climate actions. |
| LIS-3 (cont.) | Transparency, equitable engagement, and climate information | Future Tasks Under Development:<br>Task: Develop toolkits for residents, HOAs, businesses, and municipalities regarding different climate resilience strategies.<br>Task: Improve awareness and utilization of existing support programs, services, and information that are relevant to CAP recommendations.<br>Task: Build partnerships to expand climate education.<br>Task: Coordinate workforce development across strategies. |
| **Mitigation Implementation Strategies** | | |
| MIS-1 | Equitably transition to a resilient and renewable energy system | UNDER DEVELOPMENT |
| MIS-4 | Equitably transition to zero emissions vehicles | Task 1: Develop an EV deployment strategy that addresses both the County fleet transition and community-wide EV adoption. |
| | | Task 2: Establish a baseline by which goals and targets can and will be tracked. |
| | | Task 3: Prioritize transitioning public transit to ZEVS. |
| | | Task 4: Continue to increase EVSE installations through utility pilot programs and other partnerships. |
| | | Task 5: Revise Prince George's County code of ordinance, standards, policies, and processes to support ZEV deployment. |
| | | Task 6: Expand community education and outreach on zero emissions vehicles. |
| | | Task 7: Electrify Prince George's County Public Schools' fleet, including light-duty vehicles, school buses, and other mobile equipment by 2040, and private school bus fleets. |
| | | Task 8: Assess opportunities for the adoption of multimodal transit solutions such as increasing mass transit, EV car sharing, and electric shared bikes. |
| MIS-6 | Adopt internal policies to enhance resilience and reduce VMTs of County employees | Task 1: Conduct an employee commute survey and establish baseline vehicle miles traveled (VMT) among commuters and fleet users. |
| | | Task 2: Expand participation in VMT reduction strategies for commuters and fleet users. |
| | | Task 3: Reduce the carbon impacts of employee travel. |

| ID | Implementation Strategy Title | CAP Priority Recommendation Title |
|---|---|---|
| MIS-8 | Accelerate implementation of deep energy retrofits and community-wide efficiency and weatherization efforts | Task 1: Assess current policies and programs that incentivize or hinder deep energy retrofi ts for residential buildings. |
| | | Task 2: Pass the necessary legislation and make updates to County codes, policies, and programs to facilitate the implementation of deep energy retrofits for homes and residential buildings. |
| | | Task 3: Support community-wide implementation of weatherization and deep energy retrofits for homes and residential buildings. |
| | | Task 4: Advocate for statewide standards and financial support. |
| MIS-9 | Establish and adopt benchmarking energy and conservation standards | Task 1: Assess the benchmarking requirements in the Climate Solutions Now Act and other existing programs. |
| | | Task 2: Benchmark County-owned buildings. |
| | | Task 3: Distribute or develop resources to help building managers benchmark their buildings. |
| | | Task 4: Add a benchmarking dashboard and resources to the County's climate website. |
| MIS-9 (cont.) | Establish and adopt benchmarking energy and conservation standards | Task 5: Pilot deep energy retrofits on County-owned buildings. |
| | | Task 6: Incorporate energy and water standards into County building code for new buildings. |
| | | Task 7: Adopt energy and water standards for existing buildings into the County code. |
| MIS-10 | Expand County waste reduction and diversion efforts | Task 1: Conduct an emissions reduction study for County waste operations. |
| | | Task 2: Implement recommendations from the County waste operations emissions reduction study and adopt lead-by-example waste reduction and diversion practices. |
| | | Task 3: Expand and maintain the curbside composting program countywide. |
| | | Task 4: Ensure access to local and safe disposal of hazardous waste materials encountered during climate resiliency and energy effi ciency retrofits and after extreme weather events. |
| | | Task 5: Expand and promote community-wide waste diversion programs. |
| MIS-11 | Maintain a climate-resilient equitable forest and tree canopy cover | UNDER DEVELOPMENT |
| **Adaptation Implementation Strategies** | | |
| AIS-2 | Build the management of climate change risk into all county codes, standards, practices, and guides to better manage stormwater and reduce flooding | UNDER DEVELOPMENT |

| ID | Implementation Strategy Title | CAP Priority Recommendation Title |
|---|---|---|
| AIS-3 | Establish climate-resilient land use regulations to steer development to high growth areas, minimize impacts to natural resource areas, and reduce the County's exposure to flood risks | UNDER DEVELOPMENT |
| AIS-4 | Evaluate and address climate risk to dams and levees | Task 1: Assess climate projections and the consequences of failure. |
| | | Task 2: Incorporate findings into management plans. |
| | | Task 3: Prioritize and perform upgrades. |
| | | Task 4: Review future development in flood inundation areas below existing highhazard dams. |
| AIS-7 | Reduce exposure of vulnerable populations to extreme heat | Task 1: Assess where vulnerable populations will be exposed to extreme heat. |
| | | Task 2: Co-develop heat reduction strategies with priority communities. |
| | | Task 3: Review, and if required, revise Prince George's County Code to facilitate the implementation of heat reduction and cooling practices in sidewalks/roadways/parking areas. |
| | | Task 4: Develop programs and incentives to encourage the adoption of cooling practices by residents and commercial property owners. |
| AIS-8 | Establish resilience hubs to serve the needs of vulnerable communities | Task 1: Identify and assess high priority locations for resilience hubs. |
| | | Task 2: Engage community in resilience hub selection and design. |
| | | Task 3: Develop a funding and financing strategy. |
| | | Task 4: Streamline and incentivize the process for establishing of resilience hubs. |
| | | Task 5: Establish pilot resilience hubs. |
| AIS-9 | Adopt codes, standards, and practices to support a climate-ready Prince George's County | UNDER DEVELOPMENT |
| AIS-10 | Promote a climate resilient food system supported by low-carbon, climate-smart agriculture and sustainable farming practices | Task 1: Assess low-carbon resilient food system opportunities for Prince George's County. |
| | | Task 2: Establish an agriculture/food and climate staff position. |
| | | Task 3: Integrate climate resilience into local food system efforts. |
| | | Task 4: Change County procurement policies to support local food production. |
| | | Task 5: Encourage and support local food production through incentives and programs. |
| | | Task 6: Review and if Required, Revise Prince George's County code of ordinance and applicable zoning regulations to support a climate resilient food system. |
| | | Track 7: Expand community education and outreach on food and climate change. |

# ISP-2: CAP PRIORITY RECOMMENDATIONS TRANSITION INTO CLIMATE ACTION IMPLEMENTATION STRATEGIES

| ID | Climate Action Area | Implementation Strategy Title | CAP Priority Recommendation Title | Changes |
|---|---|---|---|---|
| LIS-1 | Internal Capacity | Build internal capacity to plan and implement climate action | CO-1. Build internal capacity to plan and implement climate action | ID Change |
| LIS-2 | Climate Criteria | Integrate climate resilience criteria into long-range County plans, policies, and CIP projects and ensure there is a sustainable source of funding to implement these climate implementation strategies | A-1. Integrate climate resilience criteria into long-range County plans, policies, and CIP programs by 2026 | Merged A-1 & CO-4, ID & Title Change |
| | | | CO4--Commit to Renewables Commit to clean and renewable energy (*see also CO-2 Step 4) | |
| LIS-3 | Community Engagement | Transparency, equitable engagement, and climate information | A-6. Expand information and assistance to the public regarding Impacts of climate risks and opportunities to implement climate actions | Merged A-6, CO-2, & CO-3, ID & Title Change |
| | | | CO-2. Lead by example and ensure transparency in climate action | |
| | | | CO-3. Ensure meaningful, equitable community engagement | |
| MIS-1 | Renewables | Equitably transition to a resilient and renewable energy system | M-1. Power County operations with 100% renewable energy | Merged M-1& M-2, ID & Title Change<br><br>UNDER DEVELOPMENT |
| | | | M-2. Increase deployment of solar PV in the residential and commercial sectors by expanding partnerships, incentives, and financing solutions | |
| MIS-4 | Electric Vehicles | Equitably transition to zero emissions vehicles | M-4. Accelerate deployment of EVs and charging infrastructure by County and other public agencies | Merged M-4 & M-5, ID & Title Change |
| | | | M-5. Develop a community-wide EV deployment strategy | |
| MIS-6 | Telework | Adopt internal policies to enhance resilience and reduce VMTs of County employees | M-6. Support telework policies to reduce VMT and enhance County resiliency | ID & Title Change |

| ID | Climate Action Area | Implementation Strategy Title | CAP Priority Recommendation Title | Changes |
|---|---|---|---|---|
| MIS-8 | Energy Efficiency | Accelerate implementation of deep energy retrofits and community-wide efficiency and weatherization efforts | M-8. Accelerate implementation of deep energy retrofits and community-wide efficiency and weatherization efforts | ID Change |
| MIS-9 | Benchmarking | Establish and adopt benchmarking energy and conservation standards | M-9. Establish building benchmarking requirements and energy and water consumption standards | ID Change |
| MIS-10 | Waste | Expand County waste reduction and diversion efforts | M-10. Expand County waste reduction and diversion efforts | ID Change |
| MIS-11 | Trees | Maintain a climate-resilient equitable forest and tree canopy cover | M-11. Enact and enforce "No Net Loss" tree conservation regulation and policy to maintain and expand street tree canopy and forest as a land cover | ID & Title Change<br><br>UNDER DEVELOPMENT |
| AIS-2 | Stormwater Standards | Build the management of climate change risk into all county codes, standards, practices, and guides to better manage stormwater and reduce flooding | A-2. Implement climate resilient stormwater management and expand flood mitigation programs; A-5. Require community-wide climate resilient green infrastructure | Merged A-2 & A-5, ID &Title Change<br><br>UNDER DEVELOPMENT |
| | | | A-5. Require community-wide climate resilient green infrastructure | |
| AIS-3 | Land Use | Establish climate-resilient land use regulations to steer development to high growth areas, minimize impacts to natural resource areas, and reduce the County's exposure to flood risks | A-3. Prioritize preserving and restoring natural resource areas and agricultural open space to reduce flood risk | Merged A-3, CO-5, & M-7, ID & Title Change<br><br>UNDER DEVELOPMENT |
| | | | CO-5. Land Use Strengthen land use regulations to better align individual land use decisions with State and County policies related to smart growth, natural resource conservation and green infrastructure | |
| | | | M-7. Increase investment in Activity Centers | |
| AIS-4 | Dams Levees | Evaluate and address climate risk to dams and levees | A-4. Dams Levees Evaluate and address climate risk to dams and levees | ID Change |
| AIS-7 | Extreme Heat | Reduce exposure of vulnerable populations to extreme heat | A-7. Reduce exposure of vulnerable populations to extreme heat | ID Change |
| AIS-8 | Resilience Hubs | Establish resilience hubs to serve the needs of vulnerable communities | A-8. Establish resilience hubs to serve the needs of vulnerable communities | ID Change |

| ID | Climate Action Area | Implementation Strategy Title | CAP Priority Recommendation Title | Changes |
|---|---|---|---|---|
| AIS-9 | Codes and Standards | Adopt codes, standards, and practices to support a climate-ready Prince George's County | A-9. Adopt codes, standards, and practices to support a climate-ready green buildings and development | ID & Title Change<br><br>UNDER DEVELOPMENT |
| AIS-10 | Food | Promote a climate-resilient food system supported by low carbon, climate-smart agriculture and sustainable farming practices | A-8. Promote a healthy food system supported by low-carbon, regenerative agricultural practices | ID & Title Change |

# A-1: GHG INVENTORY

**COMMUNITY GREENHOUSE GAS INVENTORY**

## DETAILED EMISSIONS RESULTS TABLE - PRINCE GEORGE'S COUNTY TOTALS

| Emissions Type (Main ClearPath Tab) | Emissions Activity or Source (ClearPath Calculator) | Inventory Records (Entered in ClearPath) | Emissions ($MTCO_2e$) | | | | | Emissions ($MMTCO_2e$) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2005 | 2012 | 2015 | 2018 | % Change, 2005-2018 | 2005 | 2012 | 2015 | 2018 | % Change, 2005-2018 |
| **BUILT ENVIRONMENT** | | | | | | | | | | | | |
| **Residential Energy** | Emissions from Grid Electricity | Residential Electricity | 1,830,576 | 1,229,146 | 1,188,005 | 1,115,119 | -39% | 1.8306 | 1.2291 | 1.1880 | 1.1151 | -39% |
| | Emissions from Stationary Fuel | Residential Natural Gas | 875,930 | 712,292 | 892,551 | 942,614 | 8% | 0.8759 | 0.7123 | 0.8926 | 0.9426 | 8% |
| | | Residential Fuel Oil | 138,289 | 69,572 | 101,428 | 75,581 | -45% | 0.1383 | 0.0696 | 0.1014 | 0.0756 | -45% |
| | | Residential LPG | 18,360 | 17,486 | 21,802 | 21,616 | 18% | 0.0184 | 0.0175 | 0.0218 | 0.0216 | 18% |
| **Commercial Energy** | Emissions from Grid Electricity | Commercial Electricity | 2,382,776 | 1,686,242 | 1,488,062 | 1,459,638 | -39% | 2.3828 | 1.6862 | 1.4881 | 1.4596 | -39% |
| | Emissions from Stationary Fuel Combustion | Commercial Natural Gas | 648,094 | 512,650 | 562,745 | 660,620 | 2% | 0.6481 | 0.5127 | 0.5627 | 0.6606 | 2% |
| | | Commercial Fuel Oil | 4,592 | 6,985 | 7,155 | 7,377 | 61% | 0.0046 | 0.0070 | 0.0072 | 0.0074 | 61% |
| | | Commercial LPG | 3,742 | 3,485 | 3,401 | 3,507 | -6% | 0.0037 | 0.0035 | 0.0034 | 0.0035 | -6% |
| **TRANSPORTATION AND MOBILE EMISSIONS** | | | | | | | | | | | | |
| **Transportation and Mobile Emissions** | On Road Transportation | On Road Mobile Emissions | 4,248,712 | 4,391,472 | 4,332,833 | 4,185,376 | -1% | 4.2487 | 4.3915 | 4.3328 | 4.1854 | -1% |
| | Aviation Travel | Passenger Air Travel | 179,703 | 103,992 | 93,206 | 134,646 | -25% | 0.1797 | 0.1040 | 0.0932 | 0.1346 | -25% |
| | Rail Transportation | Rail Transportation | 0 | 7,569 | 8,591 | 9,115 | #DIV/0! | 0.0000 | 0.0076 | 0.0086 | 0.0091 | #DIV/0! |
| | Emissions from Off Road Vehicles | Off Road Mobile Emissions | 307,612 | 230,405 | 220,517 | 235,316 | -24% | 0.3076 | 0.2304 | 0.2205 | 0.2353 | -24% |
| **WASTEWATER TREATMENT** | | | | | | | | | | | | |
| **Water and Wastewater** | Fugitive Emissions from Septic Systems | Septic System Emissions | 1,388 | 1,086 | 1,100 | 1,496 | 8% | 0.0014 | 0.0011 | 0.0011 | 0.0015 | 8% |
| | Nitrification/Denitrification Process N2O Emissions from Wastewater Treatment | Sewer System Emissions | 2,146 | 2,253 | 2,272 | 2,352 | 10% | 0.0021 | 0.0023 | 0.0023 | 0.0024 | 10% |
| | Process N2O from Effluent Discharge to Rivers and Estuaries | N2O Effluent Discharge Emissions | 1,442 | 1,018 | 849 | 929 | -36% | 0.0014 | 0.0010 | 0.0008 | 0.0009 | -36% |
| **AGRICULTURE** | | | | | | | | | | | | |
| **Agriculture** | Emissions from Agricultural Activities | Enteric Fermentation | 8,500 | 7,802 | 6,948 | 6,481 | -24% | 0.0085 | 0.0078 | 0.0069 | 0.0065 | -24% |
| | | Manure Management | 4,095 | 4,235 | 3,830 | 3,673 | -10% | 0.0041 | 0.0042 | 0.0038 | 0.0037 | -10% |
| | | Ag Soils | 17,007 | 16,927 | 15,912 | 15,785 | -7% | 0.0170 | 0.0169 | 0.0159 | 0.0158 | -7% |
| **SOLID WASTE TREATMENT** | | | | | | | | | | | | |
| **Solid Waste** | Waste Generation | Landfill Waste Generation | 151,854 | 109,227 | 108,309 | 108,998 | -28% | 0.1519 | 0.1092 | 0.1083 | 0.1090 | -28% |
| | Combustion of Solid Waste Generated by the Community | Combustion of Solid Waste | 0 | 0 | 0 | 0 | #DIV/0! | 0.0000 | 0.0000 | 0.0000 | 0.0000 | #DIV/0! |
| **OTHER** | | | | | | | | | | | | |
| **Process and Fugitive Emissions** | Hydrofluorocarbon & Refrigerant Emissions | HFCs | 311,555 | 405,372 | 467,684 | 470,918 | 51% | 0.3116 | 0.4054 | 0.4677 | 0.4709 | 51% |
| | Fugitive Emissions from Natural Gas Distribution | Natural Gas Fugitive Emissions | 44,399 | 35,686 | 42,397 | 46,707 | 5% | 0.0444 | 0.0357 | 0.0424 | 0.0467 | 5% |
| **TOTAL GREENHOUSE GAS EMISSIONS** | | | **11,180,772** | **9,554,902** | **9,569,594** | **9,507,863** | **-15%** | **11.18** | **9.55** | **9.57** | **9.51** | **-15%** |

| Column Header | Description |
|---|---|
| Emissions Type | This column lists the main tabs in the online ClearPath tool's GHG inventory entry pages in the same order listed in ClearPath. |
| Emissions Activity/Source | This column lists the ClearPath calculators used in for the development of these inventotes. These calculators are found under each of the main tabs in the same |
| Inventory Records | This column lists COG's inventory record entries according to which calculator was used to create that entry. |
| Emissions | Metric Tons of CO2 Equivalent (MTCO2e) and Million Metric Tons of $CO_2$ Equivalent ($MMTCO_2e$) by emissions activity or source for 2005, 2012, 2015 and percent change between 2005 and 2015. |

**Legend:**

| | |
|---|---|
| | Table organization only. Do not alter, enter or calculate data in gray-shaded cells. |
| | Light blue are data entry cells. |
| | Shades of green are cells that contain calculations. Moderate green colored cells contain subtotals, darker green cells contain grand totals. |

**LOCAL GOVERNMENT OPERATIONS GREENHOUSE GAS INVENTORY**

## DETAILED EMISSIONS RESULTS TABLE - PRINCE GEORGE'S COUNTY

| Emissions Type (Main ClearPath Tab) | Emissions Activity or Source (ClearPath Calculator) | Inventory Records (Entered in ClearPath) | Emissions ($MTCO_2e$) 2018 |
|---|---|---|---|
| **BUILT ENVIRONMENT** | | | |
| **Buildings and Facilities** | Emissions from Grid Electricity | Housing Authority | 1,068 |
| | | Memorial Library System | 2,195 |
| | | Public Safety | 2,762 |
| | | Environmental Services | 720 |
| | | DPW&T | 690 |
| | | Health & Human Services | 930 |
| | | Management & Budget | 461 |
| | | Office of Central Services | 5,552 |
| | | Prince George's County Government | 12,352 |
| | | Revenue Authority | 334 |
| | Emissions from Stationary Fuel Combustion - Natural Gas | Housing Authority | 484 |
| | | Memorial Library System | 427 |
| | | Prince George's County Government | 4,604 |
| **Street Lights and Traffic Signals** | Emissions from Grid Electricity | Street Lights and Traffic Signals | 3,403 |
| **TRANSPORTATION AND MOBILE EMISSIONS** | | | |
| **Vehicle Fleet** | Fleet Vehicle Emissions | County Police Vehicle Fleet - Unleaded Gasoline | 16,267 |
| | | County Police Vehicle Fleet -Diesel | 23 |
| | | County Agencies Vehicle Fleet - Unleaded Gasoline | 6,184 |
| | | County Agencies Vehicle Fleet - Diesel | 8,355 |
| | | County Agencies Vehicle Fleet - LP Autogas GGE | 273 |
| | | Outside Customers Vehicle Fleet - Unleaded Gasoline | 1,907 |
| | | Outside Customers Vehicle Fleet - Diesel | 502 |
| | Emissions from Off Road Vehicles | County Agencies Off Road Vehicle Fleet - Diesel | 1,555 |
| **Transit Fleet** | Transit Fleet Emissions | County Transit Fleet | 9,931 |
| **SOLID WASTE FACILITIES** | | | |
| **Solid Waste** | Waste Generation | Landfill Waste Generation | 108,998 |
| | | **TOTAL GREENHOUSE GAS EMISSIONS** | **189,977** |

| Column Header | Description |
|---|---|
| Emissions Type | This column lists the main tabs in the online ClearPath tool's GHG inventory entry pages in the same order listed in ClearPath. |
| Emissions Activity/Source | This column lists the ClearPath calculators used in for the development of these inventotes. These calculators are found under each of the main tabs in the same order listed in |
| Inventory Records | This column lists COG's inventory record entries according to which calculator was used to create that entry. |
| Emissions | Metric Tons of CO2 Equivalent (MTCO2e) by emissions activity or source for 2018. |

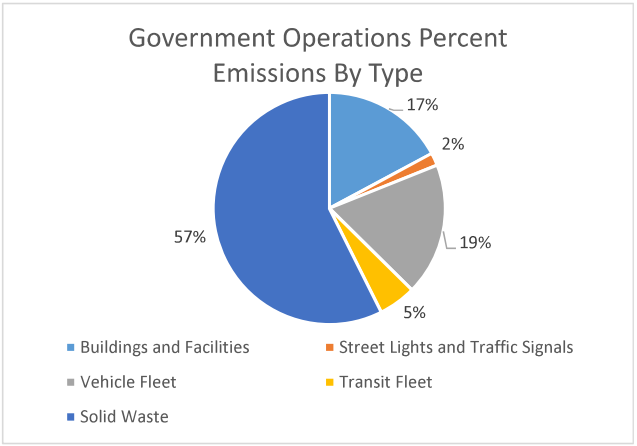
**Legend:**

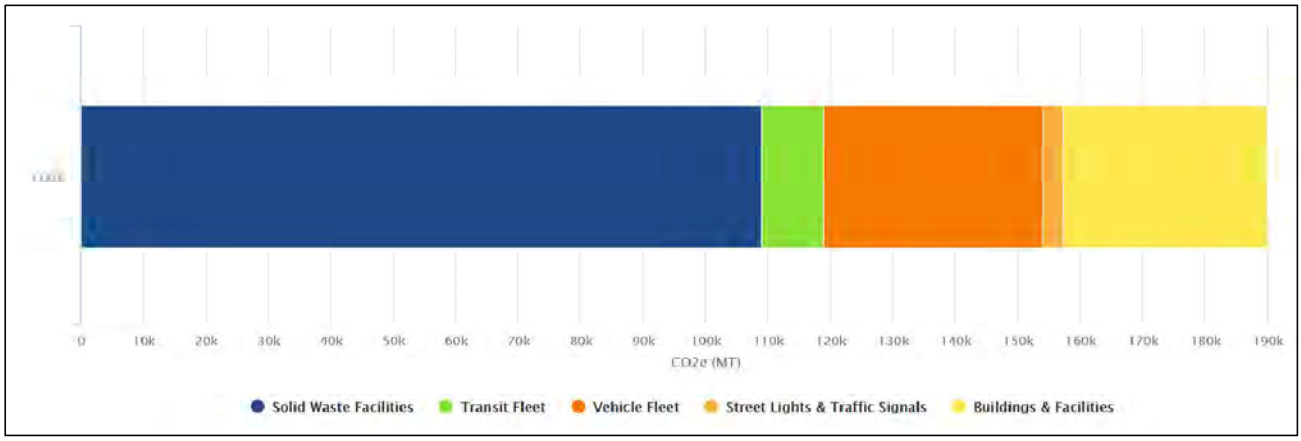
| | |
|---|---|
| | Table organization only. |
| | Light blue are data entry cells. |
| | Shades of green are cells that contain calculations. Moderate green colored cells contain subtotals, darker green cells contain grand totals. |

## LOCAL GOVERNMENT OPERATIONS GREENHOUSE GAS INVENTORY

# GREENHOUSE GAS SUMMARY CHART - PRINCE GEORGE'S COUNTY

| Emissions Type / Sector | Emissions ($MTCO_2e$) | % of Total |
|---|---|---|
| Buildings and Facilities | 32,579 | 17% |
| Street Lights and Traffic Signals | 3,403 | 2% |
| Vehicle Fleet | 35,066 | 18% |
| Transit Fleet | 9,931 | 5% |
| Solid Waste | 108,998 | 57% |
| **TOTAL GREENHOUSE GAS EMISSIONS** | **189,977** | 100% |




Source: ClearPath output

Note: ClearPath is an online greenhouse gas inventory tool. ClearPath is a product of ICLEI - Local Governments for Sustainability.

LOCAL GOVERNMENT OPERATIONS GREENHOUSE GAS INVENTORY

## DETAILED EMISSIONS RESULTS TABLE - PRINCE GEORGE'S COUNTY

| Emissions Type (Main ClearPath Tab) | Emissions Activity or Source (ClearPath Calculator) | Inventory Records (Entered in ClearPath) | Emissions ($MTCO_2e$) 2018 |
|---|---|---|---|
| **BUILT ENVIRONMENT** | | | |
| **Buildings and Facilities** | Emissions from Grid Electricity | Housing Authority | 1,068 |
| | | Memorial Library System | 2,195 |
| | | Public Safety | 2,762 |
| | | Environmental Services | 720 |
| | | DPW&T | 690 |
| | | Health & Human Services | 930 |
| | | Management & Budget | 461 |
| | | Office of Central Services | 5,552 |
| | | Prince George's County Government | 12,352 |
| | | Revenue Authority | 334 |
| | Emissions from Stationary Fuel Combustion - Natural Gas | Housing Authority | 484 |
| | | Memorial Library System | 427 |
| | | Prince George's County Government | 4,604 |
| **Street Lights and Traffic Signals** | Emissions from Grid Electricity | Street Lights and Traffic Signals | 3,403 |
| **TRANSPORTATION AND MOBILE EMISSIONS** | | | |
| **Vehicle Fleet** | Fleet Vehicle Emissions | County Police Vehicle Fleet - Unleaded Gasoline | 16,267 |
| | | County Police Vehicle Fleet -Diesel | 23 |
| | | County Agencies Vehicle Fleet - Unleaded Gasoline | 6,184 |
| | | County Agencies Vehicle Fleet - Diesel | 8,355 |
| | | County Agencies Vehicle Fleet - LP Autogas GGE | 273 |
| | | Outside Customers Vehicle Fleet - Unleaded Gasoline | 1,907 |
| | | Outside Customers Vehicle Fleet - Diesel | 502 |
| | Emissions from Off Road Vehicles | County Agencies Off Road Vehicle Fleet - Diesel | 1,555 |
| **Transit Fleet** | Transit Fleet Emissions | County Transit Fleet | 9,931 |
| **SOLID WASTE FACILITIES** | | | |
| **Solid Waste** | Waste Generation | Landfill Waste Generation | 108,998 |
| | | **TOTAL GREENHOUSE GAS EMISSIONS** | **189,977** |

| Column Header | Description |
|---|---|
| Emissions Type | This column lists the main tabs in the online ClearPath tool's GHG inventory entry pages in the same order listed in ClearPath. |
| Emissions Activity/Source | This column lists the ClearPath calculators used in for the development of these inventotes. These calculators are found under each of the main tabs in the same order listed in ClearPath. |
| Inventory Records | This column lists COG's inventory record entries according to which calculator was used to create that entry. |
| Emissions | Metric Tons of CO2 Equivalent (MTCO2e) by emissions activity or source for 2018. |

**Legend:**

| | |
|---|---|
| | Table organization only. |
| | Light blue are data entry cells. |
| | Shades of green are cells that contain calculations. Moderate green colored cells contain subtotals, darker green cells contain grand totals |

9,507,863 2018 Community-Wide Emissions (MTCO2e)

2% % of Community Wide Emissions attibuted to Government Operations

**LOCAL GOVERNMENT OPERATIONS GREENHOUSE GAS INVENTORY**

## INVENTORY INPUTS - PRINCE GEORGE'S COUNTY

| Emissions Type (Main ClearPath Tab) | Emissions Activity or Source (ClearPath Calculator) | Inventory Records (Entered in ClearPath) | Local Data Input: Metric | Local Data Input: 2018 |
|---|---|---|---|---|
| **BUILT ENVIRONMENT** | | | | |
| **Buildings and Facilities*** | Emissions from Grid Electricity | Housing Authority** | Consumption (kWh) | 3,271,527 |
| | | Memorial Library System | Consumption (kWh) | 6,721,541 |
| | | Public Safety | Consumption (kWh) | 8,459,586 |
| | | Environmental Services | Consumption (kWh) | 2,204,023 |
| | | DPW&T | Consumption (kWh) | 2,113,690 |
| | | Health & Human Services | Consumption (kWh) | 2,847,799 |
| | | Management & Budget | Consumption (kWh) | 1,411,694 |
| | | Office of Central Services | Consumption (kWh) | 17,002,979 |
| | | Prince George's County Government | Consumption (kWh) | 37,826,803 |
| | | Revenue Authority | Consumption (kWh) | 1,024,157 |
| | Emissions from Stationary Fuel Combustion - Natural Gas | Housing Authority** | Consumption (Therms) | 90,962 |
| | | Memorial Library System | Consumption (Therms) | 80,271 |
| | | Prince George's County Government** | Consumption (Therms) | 865,789 |
| **Street Lights and Traffic Signals** | Emissions from Grid Electricity | Street Lights and Traffic Signals | Consumption (kWh) | 10,420,983 |
| **TRANSPORTATION AND MOBILE EMISSIONS** | | | | |
| **Vehicle Fleet** | Fleet Vehicle Emissions | County Police Vehicle Fleet - Unleaded Gasoline | Annual Fuel Use | 1,852,787 |
| | | County Police Vehicle Fleet -Diesel | Annual Fuel Use | 2,252 |
| | | County Agencies Vehicle Fleet - Unleaded Gasoline | Annual Fuel Use | 704,268 |
| | | County Agencies Vehicle Fleet - Diesel | Annual Fuel Use | 818,331 |
| | | County Agencies Vehicle Fleet - LP Autogas GGE | Annual Fuel Use | 31,063 |
| | | Outside Customers Vehicle Fleet - Unleaded Gasoline | Annual Fuel Use | 217,244 |
| | | Outside Customers Vehicle Fleet - Diesel | Annual Fuel Use | 49,191 |
| | Emissions from Off Road Vehicles | County Agencies Off Road Vehicle Fleet - Diesel | Annual Fuel Use | 150,958 |
| **Transit Fleet** | Transit Fleet Emissions | County Transit Fleet | Annual Fuel Use | 972,688 |
| **SOLID WASTE FACILITIES** | | | | |
| **Solid Waste** | Waste Generation | Landfill Waste Generation | MSW Landfilled (Tons) | 322,956 |

| Column Header | Description |
|---|---|
| Emissions Type | This column lists the main tabs in the online ClearPath tool's GHG inventory entry pages in the same order listed in ClearPath. |
| Emissions Activity/Source | This column lists the ClearPath calculators used in for the development of these inventotes. These calculators are found under each of the main tabs in the same order listed in ClearPath. |
| Inventory Records | This column lists COG's inventory record entries according to which calculator was used to create that entry. |
| Local Data Inputs | This column lists the main local input data that impacts the greenhouse gas emission outputs (Metric Tons of $CO_2$ Equivalent -$MTCO_2e$). |

**Notes:**

* The electricity data breakouts in the Summary file were broken out in the way that data was received from the utilities or county.

** Fiscal Year (June 2018 - June 2019)

**Legend:**

| | |
|---|---|
| | Table organization only. |
| | Light blue are data entry cells. |
| | Shades of green are cells that contain calculations. Moderate green colored cells contain subtotals, darker green cells contain grand totals. |

# B-1: CLIMATE RISK AND VULNERABILITY ASSESSMENT REPORT

# **Prince George's County**
# Climate Risk & Vulnerability Assessment Report

October 2021

**Prepared for:**
Department of Environment
Prince George's County,
1801 McCormick Drive
Suite 500
Largo, MD 20774

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# I. Introduction

With a rapidly changing climate, historic trends are no longer effective proxies for predicting current and future climate conditions. Prince George's County is already facing climate change impacts through extreme weather events that stress the County's natural and built infrastructure, community resources, and economic interests. In the past 5 years alone, the County has experienced unprecedented flooding, prolonged periods of extreme heat, record-breaking snow days, and a series of severe storms. Extreme weather events like these are expected to become more frequent and more severe as the climate crisis accelerates. Understanding these trends and the potential risks to residents and infrastructure is fundamental to building resilience and making informed decisions about future investments.

The purpose of this Climate Risk and Vulnerability Assessment report is analyze the climate hazards projected to impact the County and provide insights about the vulnerability of populations and infrastructure and the associated risks and climate impacts on various County sectors. This Climate Risk and Vulnerability Assessment (CRVA) is the first of its kind for Prince George's County and serves as an important first step in strengthening the County's resilience to withstand climate change impacts for generations to come.

## *A. Methodology*

This CRVA report follows the Global Covenant of Mayors for Climate and Energy (GCoM) Climate Risk and Vulnerability Assessment framework. GCoM is an international coalition of local governments that help drive voluntary action to combat climate change. The GCoM framework consist of two main parts: evaluation of climate hazards and evaluation of factors impacting adaptive capacity. This exercise is conducted for all 6 climate hazards discussed: extreme heat, drought, episodic winters, inland flooding, coastal flooding, and severe storms. A "Risk Level" is determined for each climate hazard by assessing the probability of hazard (i.e., likelihood of occurrence) and the consequence of that hazard (i.e., gravity of the hazard). Impacts and vulnerability are also assessed for each climate hazard and is supported by climate projections and GIS analysis of relevant County layers. The results of this analysis are summarized in this report.

## *B. Structure of Document*

This CRVA is organized around the most significant climate trends likely to impact the County in the coming decades – more extreme temperatures, more frequent flooding events, and more severe storms. A total of 6 climate hazards assessed fall into these categories (Table 1).

**Table 1. Description of Climate Hazard by Trend**

| Climate Trend | Climate Hazard and Description |
|---|---|
| More Extreme Temperatures | ***Extreme Heat:*** Increasingly warmer temperatures and longer, more frequent heat waves. |
| | ***Drought:*** Drier weather conditions, closely tied with periods of extreme heat. May result in lower water supply and reduced crop yields. |
| | ***Episodic Winters:*** Though winters will become milder overall, extreme and episodic winter weather will occur more frequently (e.g., winter storms, extremely cold temperatures) |

| | |
|---|---|
| **More Frequent Flooding Events** | ***Inland Flooding:*** This type of flooding typically occurs as a result of heavy precipitation that overwhelming stormwater drainage infrastructure (flash flooding) or rivers and stream (riverine flooding). |
| | ***Coastal Flooding:*** This type of flooding typically occurs as a result of sea level rise or storm surge pushing up against Prince George's County's tidally influenced rivers. |
| **More Severe Storms** | ***Severe Storms:*** Large storms such as hurricanes, nor'easters, and derechos are being energized by warming air and more moisture in the atmosphere. |

This Report outlines: A. Climate Projections; B. Vulnerability; and C. Risks & Impacts for each of the 6 climate hazards listed above. The contents of these subsections are described in more detail below:

**A. Climate Projections:** This section provides an overview of the climate hazard, current conditions, and a summary of how the hazard is projected to worsen given climate change, particularly in the short- and medium-term. Climate projections data was sourced from the U.S. Climate Resilience Toolkit[1] and Climate Central Risk Finder[2] for coastal flooding.

**B. Vulnerability:** This section describes the vulnerability of the County's assets, systems, and populations to be adversely affected by the climate hazards. This section is divided into vulnerable populations and vulnerable infrastructure.

*Vulnerable Populations* describes how populations may be disproportionately exposed, sensitive, and/or lack the adaptive capacity to withstand or adapt to the climate hazard. See Appendix A for a more comprehensive examination of the County's social vulnerability, Equity Emphasis Areas (EEAs), and stakeholder-identified vulnerable populations.

*Vulnerable Infrastructure* describes how key assets across the County (e.g., critical facilities, residential/ commercial properties) may be vulnerable to the climate hazard. Where applicable, this section includes results of quantitative or GIS analysis that aims to better capture the extent of vulnerability.

[1] U.S. Climate Resilience Toolkit, https://toolkit.climate.gov/

[2] Climate Central Risk Finder, https://riskfinder.climatecentral.org/

## Assessing Vulnerability

**VULNERABILITY** is a function of exposure, sensitivity, and adaptive capacity:

***Exposure:*** The presence of people, livelihoods, species or ecosystems, environmental functions, services, resources, infrastructure or economic, social, or cultural assets in places and settings that could be adversely affected (GCoM, 2019). For example, neighborhoods located in floodplains are more exposed to flooding.

***Sensitivity:*** The susceptibility to harm or the degree to which an asset or population group will be adversely affected by a climate hazard. Biological factors (e.g., age, disabilities, chronic illnesses) and socio-economic factors (e.g., wealth, social isolation, access to internet/phone/vehicle, etc.) significantly influence sensitivity to climate change. For example, older adults are biophysiological more sensitive to extreme heat.

***Adaptive Capacity:*** The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities or to respond to consequences (GCoM, 2019). Assets or populations with greater adaptive capacity (e.g., back-up power at a critical facility) are better equipped to adapt to and cope with adverse climate impacts.

C. **Risk & Impacts:** This section outlines the climate risks and impacts of each climate hazard on the following key sectors and systems within the County. The systems that support Prince George's County and the quality of life of residents, including energy, public health, the economic system, transportation, and water are all likely to experience adverse impacts from the intensifying climate hazards and extreme weather events brought on by climate change. These effects can threaten public health, damage property and critical infrastructure, disrupt vital community services, and negatively affect the economy, emphasizing the need for resiliency. captures the relative risks that the climate hazards assessed pose to these fundamental systems.

Table 2 provides a high-level summary of the climate projection and assessment of climate risks and impacts for each climate hazard.

**Table 2. Hazard Projection and Impacts Summary Table**

| Hazard | Summary of Climate Projection | Impacts | | | | |
|---|---|---|---|---|---|---|
| | |  |  |  |  |  |
| **Extreme Heat** | **Average temperatures are rising, and the frequency and intensity of extreme heat days are increasing.**<br>• Relative to a 1950-2010 historic baseline, daily maximum temperature is projected to increase by 8°F by 2040 and up to 10°F by 2060.<br>• The average number of days/year with a maximum temperature >90°F is projected to increase from a 26-day historical average to roughly 61 days by 2040, and 68 - 81 days/year by 2060.<br>• The average number of days/year with a maximum temperature >100°F is projected to increase from near zero to approximately 5 days by 2040 and 8 to 25 days by 2080. | Moderate | High | Low | High | Moderate |
| **Drought** | **Droughts are projected to increase in frequency, severity, and duration.**<br>• Droughts are closely correlated with extreme heat. As temperatures and extreme days increase, so too will droughts in frequency, severity, and duration. | Low | Low | Moderate | Low | High |
| **Extreme Winter** | **Average winter temperatures are projected to become milder, yet extreme winter storms will become more episodic.**<br>• Studies show the severity and frequency of winter storms in the mid-latitude regions are already increasing from the long-term average. This trend is forecasted to continue and intensify. | High | Moderate | Moderate | Moderate | Moderate |
| **Inland Flooding & Extreme Precipitation** | **Frequency and intensity of extreme precipitation events are projected to increase, resulting in more frequent inland flooding.**<br>Relative to a 1980-2006 historic baseline, annual maximum precipitation is projected to increase by approximately 10% by 2040, and up to 60% by 2060. | Moderate | High | High | High | Moderate |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Coastal Flooding** | **Coastal, or tidally influenced, flooding events are projected to increase in frequency and severity due to the rising sea level rise and increasing tidal flooding days.**<br>• Sea level is expected to increase to 1.5 feet by 2040 and 2.4 feet by 2060, relative to a 1992 baseline, and by over 4.5 feet by the end of this century<br>• From 1980 to 2016, the County area saw an average of 2 days of high tide flooding per year. This figure is projected to increase substantially – even under a low emissions scenario, high tide flooding is projected to increase to roughly 25 days by 2040 and 67 days by 2060. | Moderate | Moderate | Moderate | Moderate | Moderate |
| **Severe Storms** | **Severe wind events are projected to increase in frequency and intensity.**<br>• The percent of Atlantic hurricanes categorized as major storms (category 3 hurricane of greater) has nearly doubled since 1979, and this trend is forecasted to continue and intensify. | High | High | High | Moderate | Moderate |

## C. Summary of Work to Date

The County, state, and region have conducted numerous assessments, plans, and other adaptation work to prepare for and mitigate hazards, assess vulnerability, and strategize solutions to enhance resiliency. The list below is not a comprehensive list of all adaptation and resiliency work to date, but rather an informative snapshot of existing efforts.

**Prince George's County Climate Action Plan: Adaptation Work Group, 2020-2021**

To support the development of the County's Climate Action Plan, Prince George's County convened a series of stakeholder working groups, including the Adaptation Work Group (AWG). The AWG met regularly to inform the CRVA and identify adaptation strategies for consideration.

In April 2021, the AWG participated in a two-part CRVA workshop to evaluate the vulnerabilities of assets and populations across the County and brainstorm opportunities to enhance resilience through adaptation strategies. A summary of this workshop is presented in Appendix B; a summary of the vulnerable assets identified are listed in Appendix C.

**Prince George's County & the City of Laurel Hazard Mitigation Plan, Updated 2017[3]**

Through their joint Mitigation Advisory Committee, Prince George's County and the City of Laurel led a coordination effort with departments and agencies to facilitate the development of the Hazard Mitigation Plan (HMP) in conformance with state and federal guidelines. The HMP was prepared pursuant to the federal Hazard Mitigation and Pre-Disaster Mitigation Programs (44 CFR Parts 201 and 206), the Flood Mitigation Assistance Program (44 CFR 78.6), and the process outlined in materials prepared by the Federal Emergency Management Agency (FEMA) for the Community.[4] The HMP outlines the hazard identification and risks assessment, mitigation goals and strategies unique to the area, and a community-specific capability assessment and implementation plan in line with broader state goals.

**Maryland Hazard Mitigation Plan, 2016[5]**

The State of Maryland's Hazard Mitigation Plan, in line with the mitigation and planning requirements outlined in FEMA's State Mitigation Review Guide,[6] summarizes the State's commitment to meet national hazard mitigation standards. The HMP is divided into 8 sections that cover state-specific hazard mitigation and risk assessment, a vulnerability assessment, mitigation strategies, and a detailed overview of planning processes and information gathering procedures the State will use to prioritize

[3] Prince George's County Office of Emergency management (2017). Prince George's County & the City of Laurel Hazard Mitigation Plan Update. https://www.princegeorgescountymd.gov/sites/default/files/media-document/dcv29942_2017-pgc-hazard-mitigation-plan-update_adopted.pdf

[4] Ibid.

[5] Maryland Emergency Management Agency (2016). State of Maryland 2016 Hazard Mitigation Plan. https://mema.maryland.gov/community/Documents/2016_Maryland_Hazard_Mitigation_Plan_final_2.pdf

[6] Federal Emergency Management Agency (2015). State Mitigation Plan Review Guide. https://www.fema.gov/sites/default/files/2020-06/fema-state-mitigation-plan-review-guide_03-09-2015.pdf

mitigation and resiliency measures moving forward. The overarching themes of the MD HMP include integration with other Local, State, and Federal planning initiatives, creation of a common Maryland-centric data sharing platform, verification of critical facilities and assets, and an emphasis on collaboration between organizations to maximize the State's success in dealing with the natural hazards now and in the future through cohesive mitigation and resiliency efforts.[7]

**Metro Washington 2030 Climate and Energy Action Plan, 2020**

The Metro Washington Council of Governments completed a Climate and Energy Action Plan in 2020 outlining a series of priority actions for local governments and partners to take to meet the region's 2030 climate mitigation and resiliency goals. The Plan also includes a Climate Risk and Vulnerability Assessment to better understand the climate hazards and risks. The results found that extreme heat and flash and riverine flooding are the top risks and infrastructure conditions/maintenance is the top adaptive capacity challenge in the region.

[7] Maryland Emergency Management Agency (2016). State of Maryland 2016 Hazard Mitigation Plan. https://mema.maryland.gov/community/Documents/2016_Maryland_Hazard_Mitigation_Plan_final_2.pdf

# II. More Extreme Temperatures

Human-led emissions are warming the atmosphere at an unprecedented rate causing average temperatures to increase globally. In the D.C. area, the average summer temperature has already increased by 2.2 degrees F since 1970.[8] While a 2 degrees F is seemingly insignificant, small changes in the average results in significant changes in temperature extremes, resulting in more severe and unpredictable summer and winter conditions.

Extreme and unpredictable temperature events increase the prevalence of heat- and cold-related illnesses, particularly among the most vulnerable populations and communities. Excessively high and low temperatures stress the County's infrastructure making it susceptible to service disruptions. Native plants, animals, and ecosystems are also sensitive to temperature extremes, as are local trades and businesses that rely on these resources for crop production and other outdoor services.

This section outlines the climate projections, vulnerabilities, and risks and impacts for extreme heat, droughts, and extreme winters.

## *A. Extreme Heat*

Extreme heat, typically felt during the summer months, occurs when the temperature is substantially hotter and/or more humid than average. A heat wave occurs when a period of extreme heat lasts for 2 or more days. Extreme heat is the leading cause of weather-related deaths in the United States.[9] According to Maryland Department of Health more than 2,400 people in Maryland suffered from heat-related illnesses from June 1 to July 12, 2021.[10]

Figure 1 depicts the National Weather Service Heat Index. The Heat Index indicates the perceived temperature, incorporating the interaction between relative humidity and air temperature.[11] When the atmospheric moisture content (i.e., relative humidity) is high, the rate of evaporation from the body decreases, making the human body feel warmer.[12] The Heat Index has important considerations for the human body's comfort, creating potentially dangerous conditions, as outlined in Table 3., if left unmitigated.

[8] Climate central (2021). 2021 Summer Package. https://medialibrary.climatecentral.org/resources/2021-summer-package

[9] American Public Health Association (2018). Differences in Heat-related Mortality by Citizenship Status: United States 2005-2014. https://www.apha.org/-/media/Files/PDF/topics/climate/Heat_Related_Deaths.ashx

[10] Maryland Office of Preparedness and Response (2021). Reports: Heat. https://health.maryland.gov/preparedness/Pages/Reports_Heat.aspx

[11] National Weather Service, National Oceanic and Atmospheric Administration (2020). What is the heat index? https://www.weather.gov/ama/heatindex

[12] Ibid.

**Figure 1. National Weather Service Heat Index.**

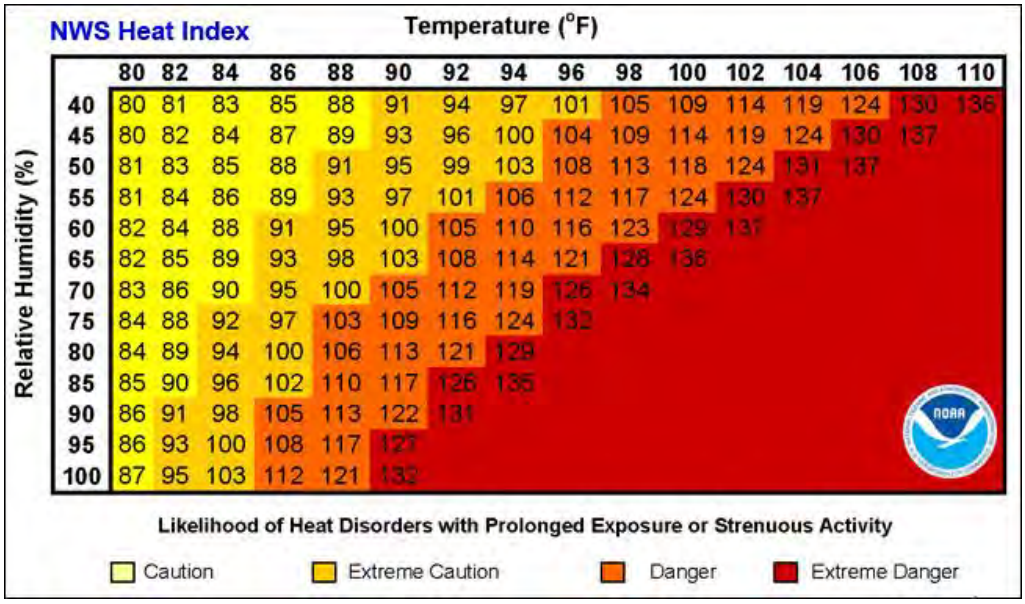



**Table 3. Heat Index classification and effect on human body.**

| Classification | Heat Index | Effect on the body |
|---|---|---|
| **Caution** | 80°F - 90°F | Fatigue possible with prolonged exposure and/or physical activity |
| **Extreme Caution** | 90°F - 103°F | Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity |
| **Danger** | 103°F - 124°F | Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity |
| **Extreme Danger** | 125°F or higher | Heat stroke highly likely |

## Climate Projection: Extreme Heat

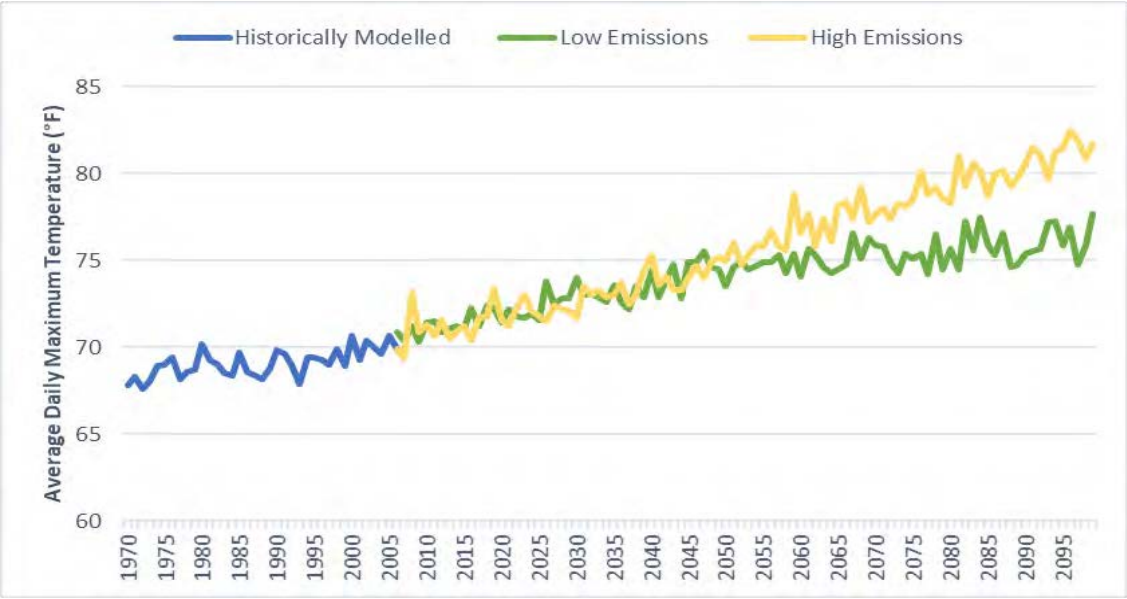
### *Rising Temperatures*

The average annual temperature in Maryland has risen by more than 1.5°F since the beginning of the 20th century, and average temperatures are projected to continue increasing.[13] For example, the historical average (1950 – 2010) daily maximum temperature in Prince George's County is 66°F and

[13] NOAA National Centers for Environmental Information (2017). Maryland State Climate Summary. https://statesummaries.ncics.org/chapter/md/

projected to increase by about 8°F by 2040 and up to 10°F by 2060, as displayed in Figure 2.[14] Summer temperatures peak in July, when the average monthly temperature has historically been 87.7°F.[15] Average July temperatures are also expected to increase to 90°F by 2025 and, depending on the future emission scenario, can reach a monthly average of 96°F by 2075.[16]

**Figure 2. Projected increase of average daily maximum temperature in Prince George's County (U.S. Climate Resilience Toolkit Climate Explorer).**




### *More Extreme Heat Days*

In addition to higher annual temperatures, the County is projected to experience more frequent, intense, and longer-lasting heat waves. Historically, the County experiences about 26 days per year where the maximum temperature exceeds 90°F (approximately twice as many as the state average) and less than one day per year with a maximum temperature reaching above 100°F.[17] The number of heat days with a maximum temperature above 90°F is projected to increase to roughly 61 days by 2040, and 68 to 81 days per year by 2060. The average number of heat days with a maximum temperature above

[14] U.S. Climate Resilience Toolkit (2021). Climate Explorer: Prince George's County, MD. https://crt-climate-explorer.nemac.org/climate_graphs/?county=Prince%2BGeorge%27s%2BCounty&city=Prince%2BGeorge%27s%2BCounty%2C%20MD&fips=24033&lat=38.784921100000001&lon=-76.8720961&zoom=7&nav=local-climate-charts

[15] U.S. Federal Government (2020). U.S. Climate Resilience Toolkit Climate Explorer. https://crt-climate-explorer.nemac.org/

[16] Ibid. (Data only available for 2025, 2050 and 2075.)

[17] U.S. Federal Government (2020). U.S. Climate Resilience Toolkit Climate Explorer. https://crt-climate-explorer.nemac.org/

100°F is projected to increase from near zero to approximately 5 days by 2040 and 8 to 25 days by 2080.[18]

**Figure 3. Number of days with maximum temperature above 90°F (U.S. Climate Resilience Toolkit Climate Explorer).**

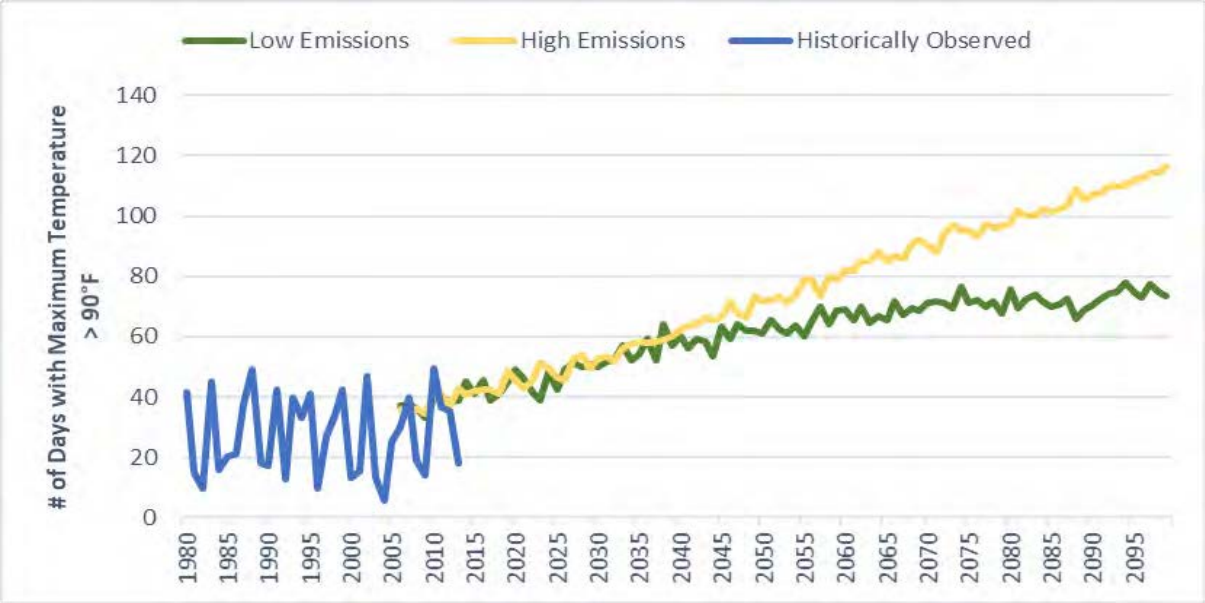
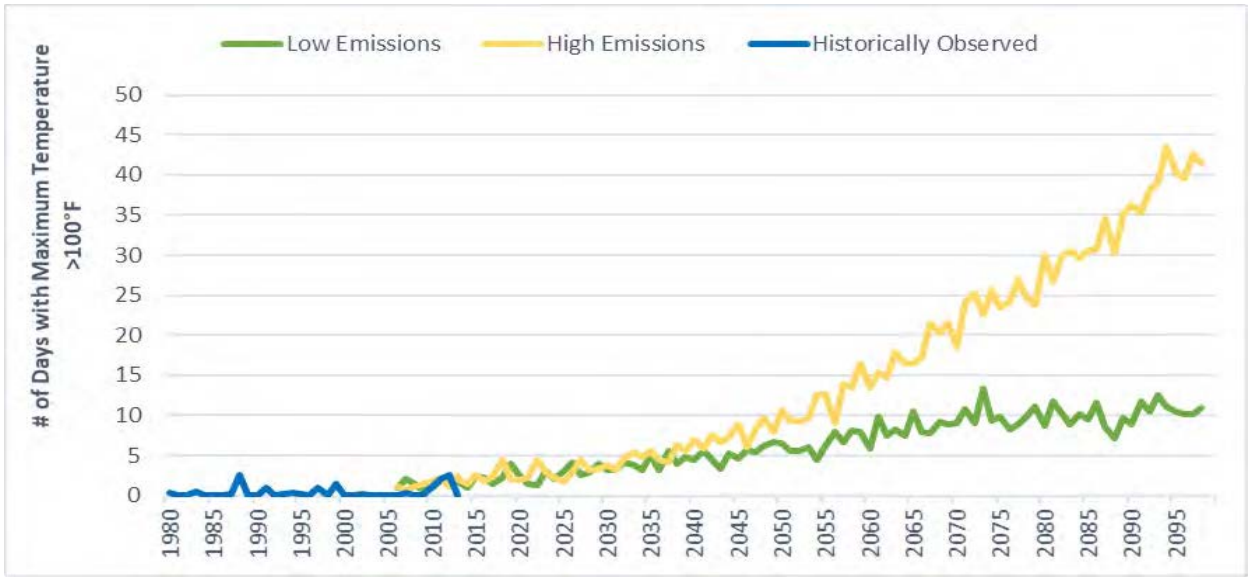



**Figure 4. Number of days with maximum temperature above and 100°F (U.S. Climate Resilience Toolkit Climate Explorer).**




[18] Ibid.

Figure 6 illustrates the *increase* in heat days (days where the maximum daily temperature exceeded 90°F) from 2006-2016, relative to a historic baseline average from 1986-2006, by Census Tract. The map demonstrates the County is not warming at an equal rate. The southwest region, for example, has seen a greater increase in extreme heat days relative to the historic average than other parts of the County.

## Past Impacts

Summers in Prince George's County are warm and humid, and heat advisories are not uncommon. June to August are the warmest months, with average temperatures in the mid to high 80s.[19] Summer of 2020 was the hottest on record in Prince George's County.

### EXTREME HEAT HIGHLIGHT

In the summer of 2012, Prince George's County and the greater metro Washington area experienced a historic heat wave that saw 11 days in a row exceed 95°F, and peak temperatures reach 105°F.

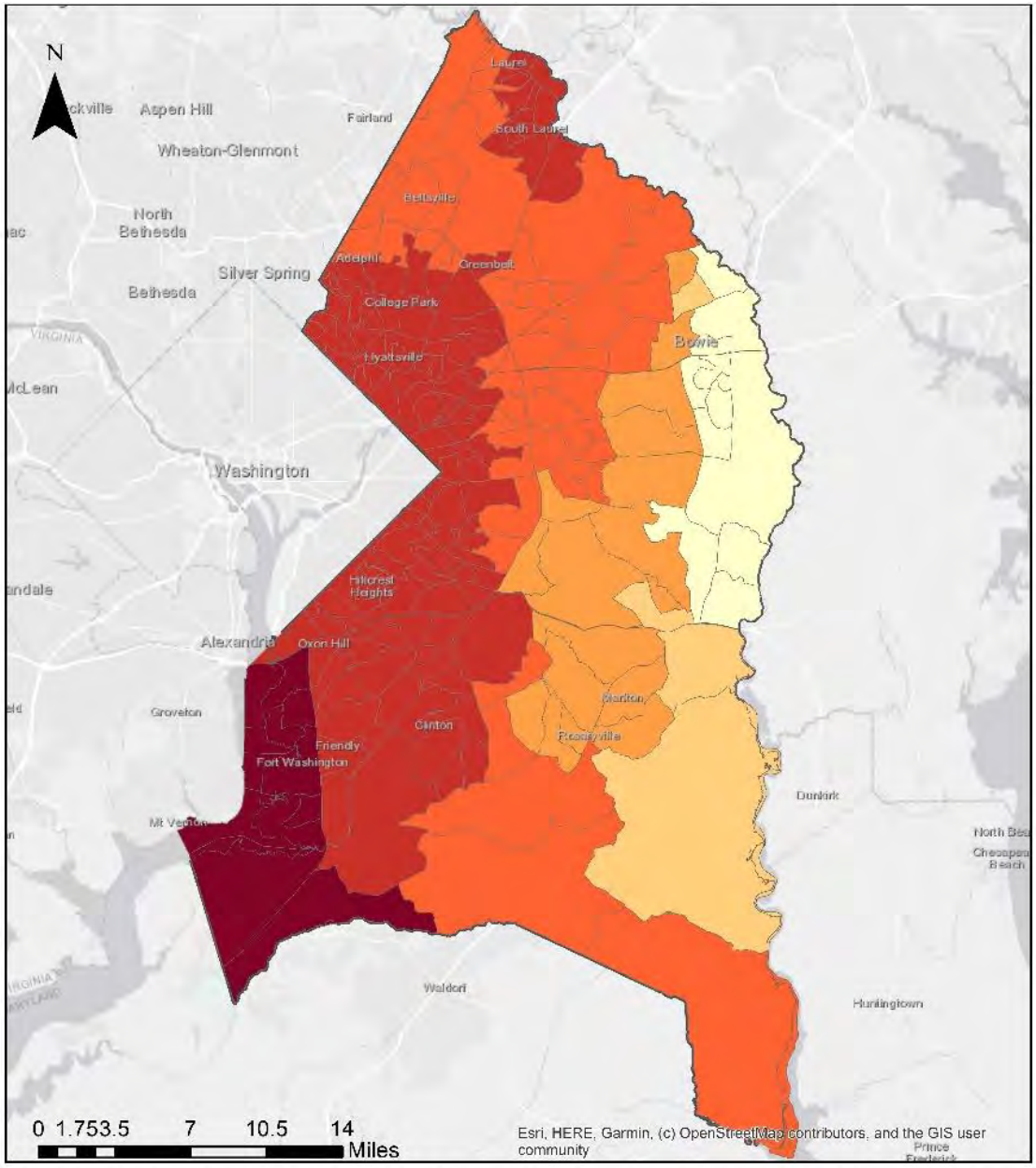
The heat wave was preceded by severe thunderstorms that left millions in the region with a crippling loss of power, and therefore air conditioning, for several days. In total, these events resulted in dozens of lives lost and billions of dollars' worth of damages, including costly disruptions to public transportation networks. For example, in Hyattsville, 3 green line train cars were derailed after the tracks suffered a heat kink (misalignment as a result of expansion of metal rails caused by extremely high and prolonged temperatures).

**Figure 5. Commuters wait for shuttle buses at the East Hyattsville station after heat-induced train derailments suspended service (Juana Arias/The Washington Post).**


[19] Best Places (n.d.). Climate in Prince George's County. https://www.bestplaces.net/climate/county/maryland/prince_george's

**Figure 6. Warming is not occurring equally across the County; the southwest region of the County has seen a greater increase in extreme heat days.**

Increase in heat days from 2006-2016, relative to historic baseline average from 1986-2006, by Census Tract.




**Increase in Heat Days (Days)**

| | |
|---|---|
| 3.7 - 5.9 | 10.3 - 12.5 |
| 5.9 - 8.1 | 12.5 - 14.7 |
| 8.1 - 10.3 | 14.7 - 16.9 |

Average increase of heat days from 2006 -2016, relative to a 1986-2006 baseline.

Heat day: daily maximum temperature exceeds 90F.

Source: CDC National Environmental Public Health Tracking Network, 2016

## Vulnerability

For residents and communities, vulnerability to extreme heat can be influenced by various factors such as access to air conditioning, proximity to and awareness of cooling centers, extent of heat exposure, and biological factors, like age and presence of disabilities and/or chronic illnesses, among others. For community assets and critical infrastructure, the age of the infrastructure and presence of cooling strategies (e.g., green infrastructure) will impact the structure's ability to withstand heat impacts.

The following sections elaborate on populations and infrastructure vulnerable to extreme heat in Prince George's County.

### *Vulnerable Populations*

| **Exposure** |
| --- |
| Residents who remain outdoors for prolonged periods of time (e.g., outdoor workers and people experiencing homelessness) face greater exposure to heat and are more at-risk of heat-related illnesses. Residents located in Urban Heat Islands (urbanized areas that experience higher temperatures than their surroundings as a result of less tree canopy cover and green space, and more impervious surface cover) are also more exposed to heat. Trees provide shading and a cooling effect through evapotranspiration; therefore, neighborhoods with low tree canopy cover have less relief from the heat. Stakeholders shared that while the County has a 40% tree cover, the inner part of the Beltway is only at 8% of cover. Figure 7 maps tree canopy cover in the County and outlines the EEAs. |
| **Sensitivity** |
| Age is closely related to heat sensitivity – the elderly is at greater risk of dehydration and are more likely to be dependent on caretakers, have limited mobility, and/or physical or cognitive health conditions. Young children (e.g., new-borns to 5 years old) are also physiologically more sensitive to heat given a reduced sweating capacity and more rapid heat intake. The presence of physical and/or mental disabilities and chronic illnesses can impair the body's ability to properly regulate temperature and/or face challenges with limited mobility and the ability to protect themselves. This demographic is also more likely to require additional support during heat emergencies, such as transportation to cooling centers and specialized care. |
| **Adaptive Capacity** |
| Low-income households are more likely to be energy burdened or have less disposable income to purchase or run their AC units. Figure 16 illustrates the extent of energy burden by area median income (AMI) for both renters and owners in Prince George's County. As displayed, lower-income residents are significantly more energy burdened than moderate- and high-income residents paying more than double in percent of income going to energy costs. People of color may also have lower adaptive capacity given higher rates of health disparities due to historical and structural patterns of inequity, marginalization, and discrimination, making them more susceptible to heat-related illnesses. Residents with low English proficiency may also lack access or awareness to education and awareness materials, such as heat advisories and factsheets. |

**Figure 7. Tree canopy cover and equity emphasis areas in Prince George's County. (Planning Department)**

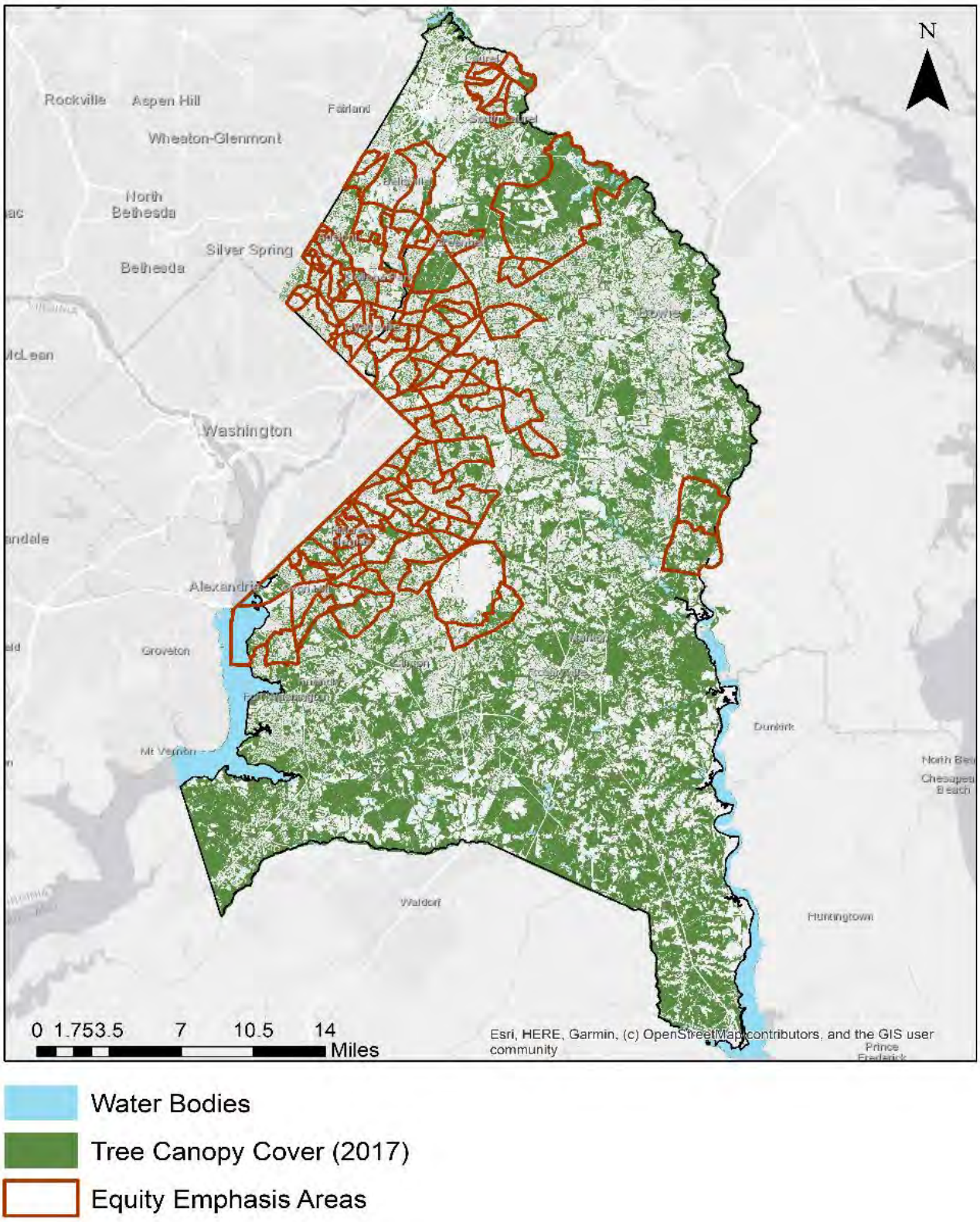
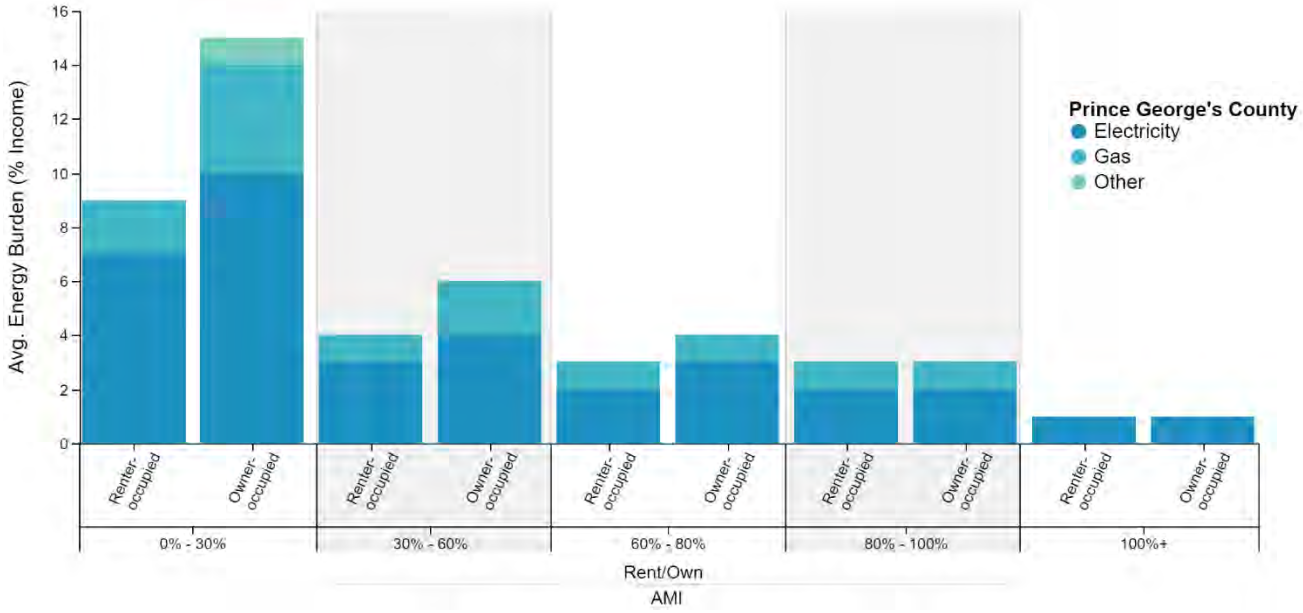


**Figure 8. Average energy burden, as a percent of income, in Prince George's County, by area median income (AMI).**




### *Vulnerable Infrastructure*

Warming annual and summer temperatures stress the County's critical infrastructure, such as energy and transportation infrastructure. While buildings and infrastructure across the County are susceptible to heat, those located in Urban Heat Islands and areas with lower tree canopy cover face greater exposure and are therefore more vulnerable. Above ground infrastructure, such as power transmission lines and railroad tracks, are also more exposed to heat. Critical facilities and infrastructure were not designed to withstand excessively high temperatures and can therefore be susceptible to service disruptions.

## Risks & Impacts

Climate change is projected to increase the average temperature, in addition to the number, intensity, and duration of heat waves. This will in turn likely increase the prevalence of heat-related illnesses and other adverse impacts to the County's assets, systems, and populations. There is also an increased likelihood that the resiliency threshold of current systems may be exceeded due to projected increased heat impacts.

The Table below summarizes impacts to key systems and sectors in Prince George's County.

| ***Systems/Sectors*** | ***Impact Magnitude*** | ***Description*** |
|---|---|---|
| *Energy/ Utilities* | Moderate | As extreme heat days increase, consumer demand for power is expected to increase, stressing the grid more frequently and for longer periods of time as the need for cooling resources and refrigeration increases. This strain on the electrical power system may result in potential brownouts or blackouts more frequently and |

| | | |
|---|---|---|
| | | for longer periods of time. The additional load coupled with warmer air can cause transmission lines to swell and become less efficient. Rising air temperatures have been found to reduce transmission capacity by 2 to 6% on average, relative of a 1990-2020 base period.[20] Above-ground infrastructure with prolonged exposure to heat can stress equipment. |
|  *Public Health* | High | Extreme heat poses serious and potentially fatal threats to human health and is the leading cause of climate-related deaths in the United States. Extreme heat coupled with high humidity slows evaporation, limiting the body's ability to cool itself which can catalyze heat-related illnesses. Residents may experience dehydration, heat rash, heat exhaustion, and heat stroke, the latter of which can be fatal due to direct and prolonged heat exposure. Rates of hospitalization due to the above effects of extreme heat are expected to increase as high heat days increase and as heat waves become more frequent and last for longer periods of time. Increasingly warming temperatures also mean longer growing seasons (i.e., longer allergy season) and longer mosquito growing season (i.e., greater prevalence of mosquito-borne diseases). Extreme heat is often coupled with worsening air quality, which traps pollutants and can aggravate respiratory illnesses, such as asthma. Studies have shown a correlation with increased rates of suicide and homicide during periods of extreme heat. |
|  *Commercial/ Economy* | Moderate | Studies have shown extreme heat is linked to decline in worker productivity and therefore profitability in an economically meaningful way. Worker productivity is estimated to decline by 2% for every degree Celsius above normal ambient temperature.[21] Data centers and related information and communication technology (ICT) equipment and systems facing increased temperatures for longer periods of time can face heat damage, shorter lifespans, and need for more frequent repair and replacement. If prolonged, extreme heat can lead to droughts, often accompanied by reductions to crop yields and therefore income loss for the agricultural community. See Drought Section for more information. |
|  *Transportation* | High | Pavement and rail tracks may expand and buckle, placing strain on transportation infrastructure. Train tracks exposed to high temperatures are increasingly at risk of warping or buckling and can |

[20] Bartos et al. (2016). "Impacts of Rising Air Temperatures on Electric Transmissions Ampacity and Peak Electricity Loads In The United States." https://iopscience.iop.org/article/10.1088/1748-9326/11/11/114008/meta

[21] Park, J. (2015). "The Labor Productivity Impacts of Climate Change: Implications for Global Poverty." https://www.worldbank.org/content/dam/Worldbank/document/Climate/Climate%20and%20Poverty%20Conference/D2S3_Park_Labor%20Productivity%20Impacts%20from%20Climate%20Change%20-%20Feb%2010%202015%20v13short.pdf

| | | |
|---|---|---|
| | | create dangerous accident-prone conditions.[22] The risk of buckling increases significantly as temperatures reach 110°F.[23] In addition to dangerous accidents, track buckling can result in travel delays and faster deterioration of the infrastructure. Airport runways are also vulnerable to extreme heat, which can cause asphalt to soften and deteriorate. Smaller, regional aircraft cannot fly safely if the heat index exceeds 118°F. |
|  *Water Sanitation/ Supply* | Moderate | Increasing instances of high heat is correlated with droughts and is often accompanied by a decrease in the available water supply. For more information, see Drought Section. |

[22] For example, in the summer of 2002, an Amtrack bus headed to DC derailed in Kensington, Maryland as a result of heat stress buckling the tracks. The accident resulted in 97 injured passengers, and 6 out of 13 train cars faced heavy damages and costly repairs.
Rowan E. et al. (2013). Assessing the Sensitivity of Transportation Assets to Extreme Weather Events and Climate Change.
https://www.researchgate.net/publication/264730154_Assessing_the_Sensitivity_of_Transportation_Assets_to_Extreme_Weather_Events_and_Climate_Change

[23] Union of Concerned Scientists (2018). Heat Waves and Climate Change.
https://www.ucsusa.org/sites/default/files/attach/2018/08/extreme-heat-impacts-fact-sheet.pdf

## *B. Drought*

Droughts are complicated phenomena that can be defined differently, depending on the impact. The National Centers for Environmental Information defines droughts in four ways:

- **Meteorological drought** happens when dry weather patterns dominate an area.
- **Hydrological drought** occurs when low water supply becomes evident, especially in streams, reservoirs, and groundwater levels, usually after many months of meteorological drought.
- **Agricultural drought** happens when crops become affected.
- **Socioeconomic drought** relates the supply and demand of various commodities to drought.[24]

While droughts do not impact Maryland as severely as other U.S. regions, "flash droughts," or the rapid onset or intensification of drought conditions, have the potential to cause extensive damage to agriculture, economies, and ecosystems.[25] Unlike slow-evolving droughts caused by a decline in precipitation, flash droughts occur when low precipitation is accompanied by abnormally high temperatures (e.g., heat waves), high winds, and/or changes in solar radiation.[26]

Though intense droughts occur infrequently, the region may experience them more frequently and more severely in the coming decades as a result of the increased prevalence of extreme heat (see Extreme Heat Section for more information) and increased variability in precipitation. These sometimes-rapid changes can quickly raise evapotranspiration rates and deplete available water from the landscape, triggering more acute flash drought events that can quickly evolve into dangerous situations without proper mitigation measures in place. Additionally, the likelihood of flash flooding increases when high heat decreases the moisture content of the soil.

**Table 4. Drought severity classification and possible impacts as determined by the State of Maryland. (U.S. Drought Monitor).**

| Classification | Description | Possible Impacts |
|---|---|---|
| **D0** | **Abnormally Dry** (precursor to drought, not actual drought) | • Crop growth is stunted; planting is delayed<br>• Fire danger is elevated; spring fire season starts early<br>• Lawns brown early; gardens begin to wilt |
| **D1** | **Moderate Drought** | • Irrigation use increases; hay and grain yields are lower than normal<br>• Honey production declines<br>• Wildfires and ground fires increase |

[24] National Centers for Environmental Information (n.d.). Definition of Drought. https://www.ncdc.noaa.gov/monitoring-references/dyk/drought-definition#:~:text=Meteorological%20drought%20happens%20when%20dry,happens%20when%20crops%20become%20affected.

[25] National Integrated Drought Information System (2020). Flash Drought. https://www.drought.gov/what-is-drought/flash-drought

[26] Ibid.

| | | |
|---|---|---|
| **D2** | **Severe Drought** | • Specialty crops are impacted in both yield and fruit size<br>• Producers begin feeding cattle; hay prices are high<br>• Warnings are issued on outdoor burns; air quality is poor |
| **D3** | **Extreme Drought** | • Crop loss is widespread; Christmas tree farms are stressed; dairy farmers are struggling financially<br>• Well drillers and bulk water haulers see increased business<br>• Water recreation and hunting are modified; Wildlife disease outbreak is observed |
| **D4** | **Exceptional Drought** | • Maryland has experienced little or no exceptional drought, so there are no D4-level drought impacts recorded in the Drought Impact Reporter. |

## Climate Projection: Drought

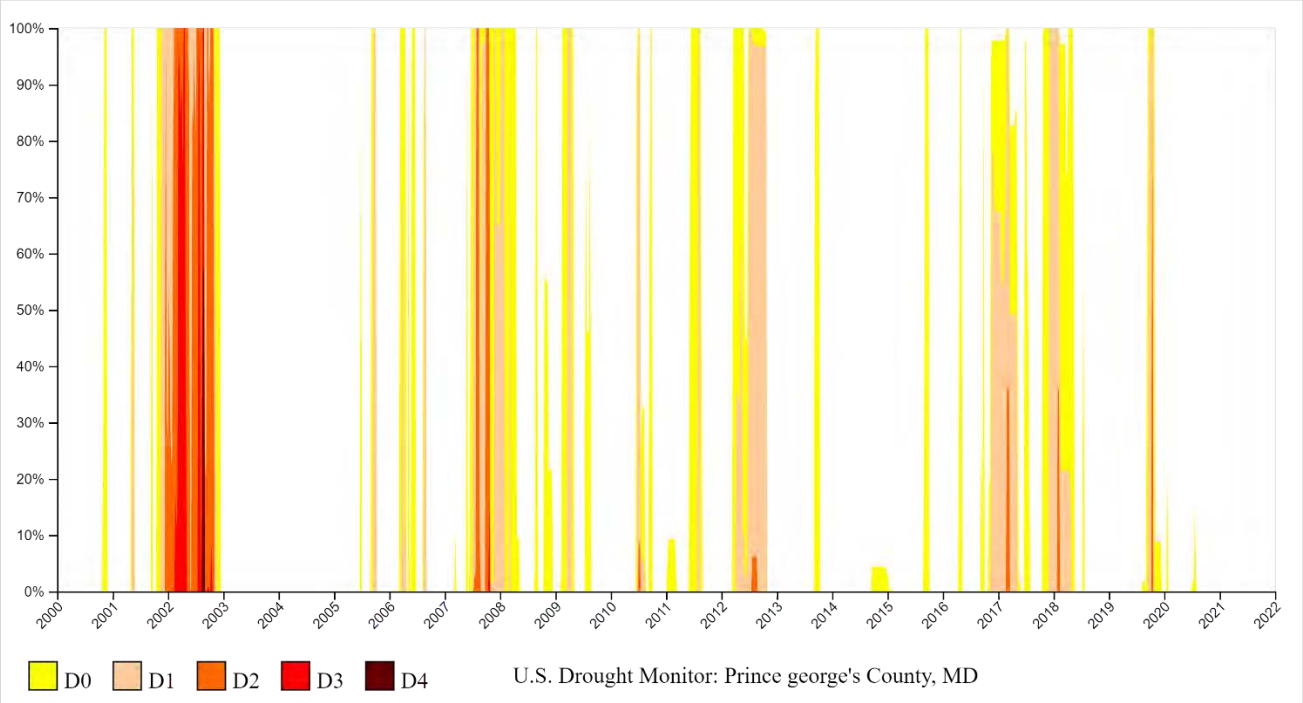
Droughts and flash droughts are most likely to occur during the summer as temperatures warm. In comparison to other regions of the United States, droughts are of lower risk in Maryland. There is significant uncertainty across climate models in projecting future drought conditions, though meteorological drought conditions may rise given increasing temperatures in the summer months.

## Past Impacts

Drought conditions occur occasionally in Prince George's County. As demonstrated in Figure 9, D0 abnormally dry conditions occur almost annually while D1 moderate drought conditions occur less frequently. D2 Severe, D3 extreme, and D4 exceptional droughts are rarer; however, in 2002, the County experienced a D3 severe drought that lasted for much of the year with conditions briefly developing into a D4 exceptional drought. This drought was the driest period in Maryland's history since record-keeping began in 1871; groundwater level and steam flows hit record lows in much of the state.[27]

[27] Roylance F. (2002). Md. Drought Deepens, No Relief in Sight. https://www.baltimoresun.com/news/nation-world/bal-te.md.drought21aug21-story.html

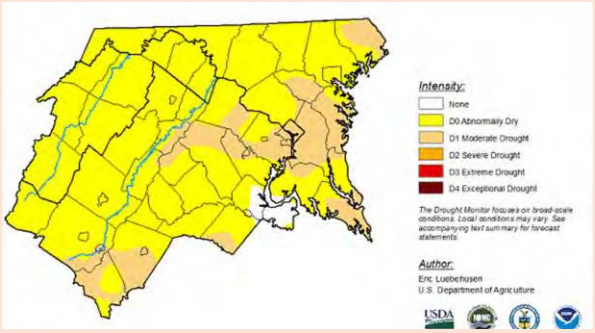
**Figure 9. Historical drought conditions in Prince George's County from 2000 to present day. (U.S. Drought Monitor).**




## FLASH DROUGHT HIGHLIGHT

In September of 2019, Prince George's County, along with much of Maryland, experienced a flash drought. Very little precipitation and an unusually late warm season contributed to the development of the D1 Moderate Drought. Agricultural interest groups reported drought-related stress to pasture, hayfields, and crops. The drought conditions did not warrant water restrictions, yet streamflow fell below average levels.

**Figure 10. U.S. Drought Monitor, September 2019 (NottinghamMD).**




## Vulnerability

Residents, businesses, and infrastructure that are heavily water-dependent are most vulnerable to the impacts of droughts. In the event a drought reduces the water supply, resulting in low-flow conditions, the quantity and pressure of water available for other critical uses (e.g., drinking water, water in power plants, water to fight fires) is subsequently reduced.

The following sections elaborate on populations and infrastructure vulnerable to drought in Prince George's County.

### *Vulnerable Populations*

| Exposure |
| --- |
| Droughts are often geographically expansive, and so the County as a whole (and region) will typically be exposed. |
| **Sensitivity** |
| Residents who are rely on high water-consumption for income are most sensitive to droughts. This may include agricultural workers, laundromats, car washes, communications facilities, water recreation activities, and more. |
| **Adaptive Capacity** |
| Lower income residents who are heavily dependent on water consumption for income are less able to cope with the financial impacts of water restrictions potentially imposed by drought. |

### *Vulnerable Infrastructure*

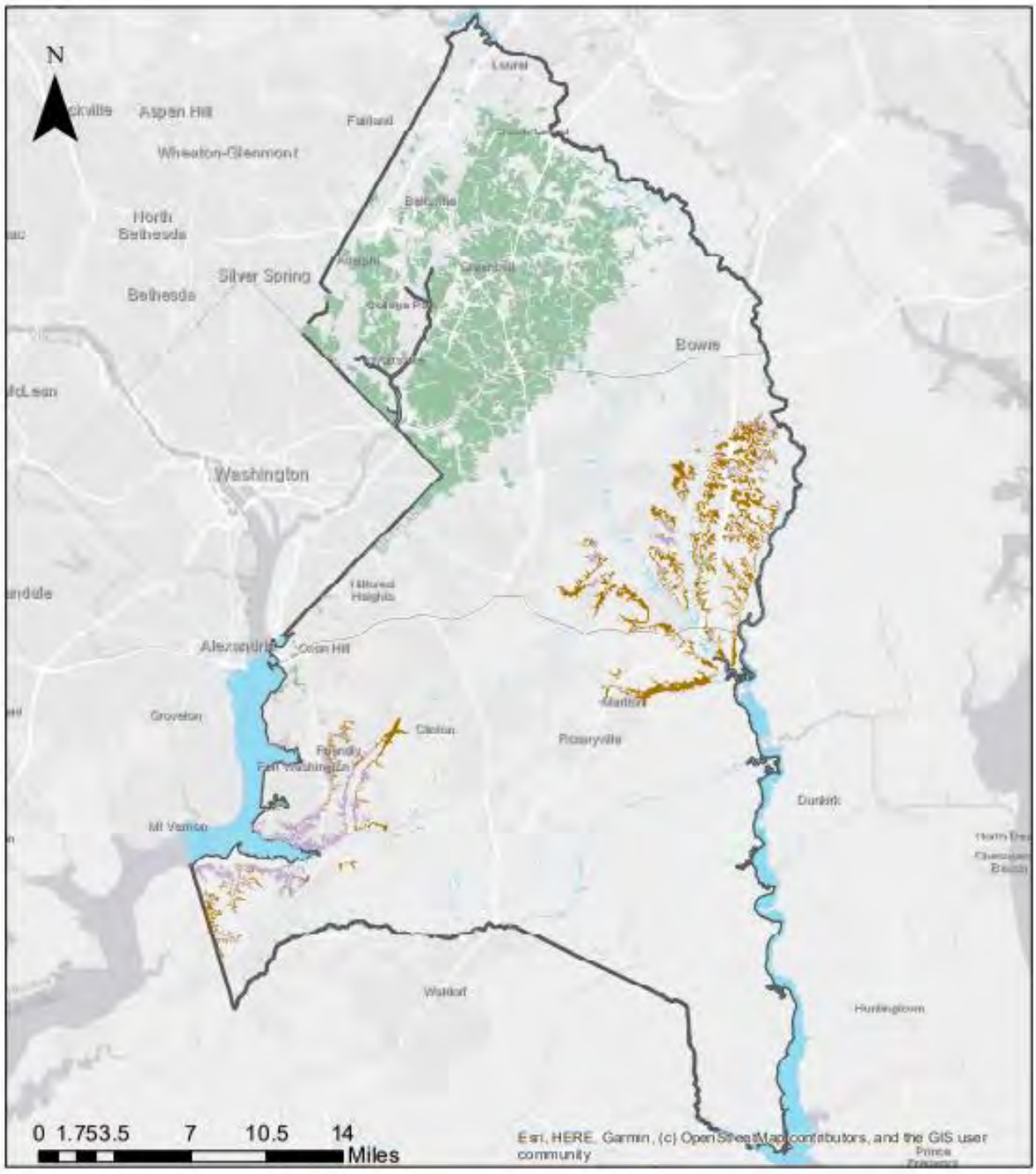
While droughts have mostly moderate direct impacts on physical infrastructure, succeeding water scarcity can challenge or disrupt important community services, such as firefighting equipment and water sanitation infrastructure. For example, reduced water supply can compromise firefighting efforts as equipment has a minimum water pressure level needed to activate and work effectively.[28] Also, the County's water sanitation systems and equipment can be jeopardized during low-flow conditions, possibly resulting in contamination of the water supply. As flow levels in rivers and aquifers decrease, saltwater can move inland, contributing further to water contamination as water sanitation plants are often not equipped to treat saline intrusion.[29]

As water supplies are depleted during drought and groundwater is withdrawn, the sinking of the ground (subsidence) can occur, sometimes leading to sinkholes. Problematic soils conditions – such as Howell, Christiana and Marlboro Clay soils present mainly in South County – which have high shrink/swell (movement) and deformation/slip (failure) properties subject to changes in soil moisture content from drought, flooding, or extreme precipitation may make buildings and structures unstable, as they may crack and compromise foundations leading to structural instability. Figure 11 maps problematic soils across the County, including Christiana Complexes, Marlboro Clay, Howell Complexes.

[28] Operational Analysis Division, U.S. Department of Homeland Security (2015). Drought Impacts to Critical Infrastructure. https://content.govdelivery.com/attachments/USDHSFACIR/2015/04/30/file_attachments/386553/Drought+Impacts+to+Critical+Infrastructure.pdf

[29] Ibid.

**Figure 11. Problematic soils in Prince George's County.**



## Risks & Impacts

As climate change increases the frequency, severity, and duration of extreme heat events, an increased number of assets, systems, and populations may be affected by drought. Droughts can increase the likelihood that the resiliency threshold of agriculture and other water-dependent systems will be exceeded.

The Table below summarizes impacts to key systems and sectors in Prince George's County.

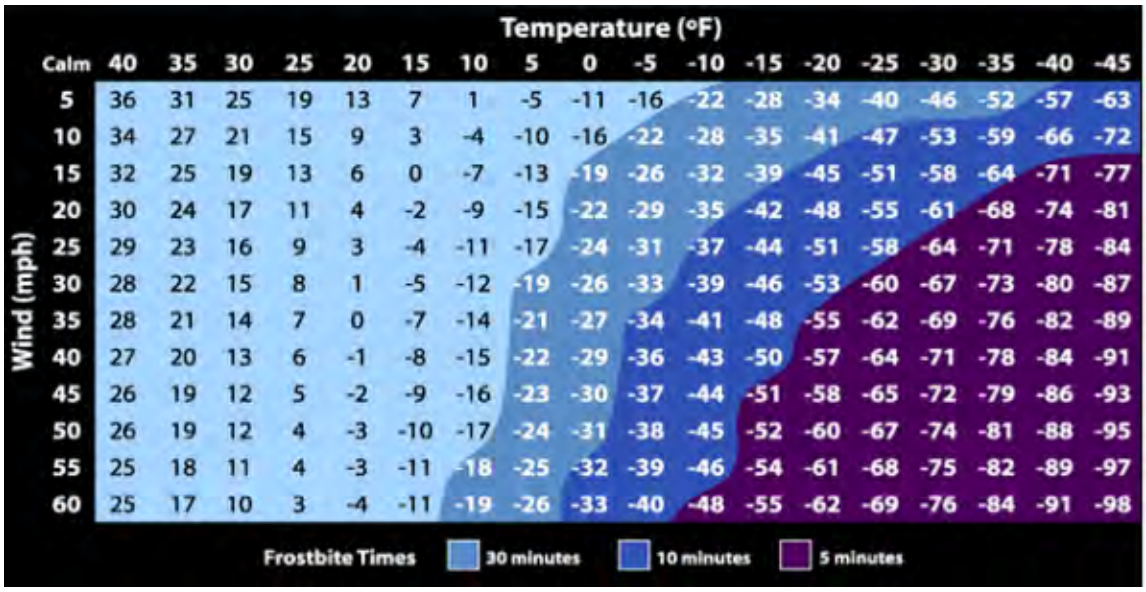
| *Systems/Sectors* | *Impact Magnitude* | *Description* |
|---|---|---|
|  *Energy/ Utilities* | Low | Energy production requires water for cooling in thermal processes and other energy production activities, regardless of energy source. Limited water supply can constrain the operation of power plants and production of energy and compromise the energy system's resilience. |
|  *Public Health* | Low | Droughts are closely correlated with periods of extreme heat; therefore, the health impacts are typically as it relates to heat-related illnesses and poor air quality. Droughts can reduce crop yield loss causing mental and behavioral stress for agricultural workers and may cause food insecurity. |
|  *Commercial/ Economy* | Moderate | The most significant economic impact of droughts is on agriculture. Droughts can stunt crop growth, reducing crop yields and therefore income. Consumers may see an increase in prices as farmers cope with lower yields. Additionally, if a prolonged drought imposes water restrictions, businesses with high water consumption rates (e.g., laundromats, car washes, communications facilities) will be forced to operate at a reduced capacity. |
|  *Transportation* | Moderate | Droughts are closely correlated with periods of extreme heat; therefore, the health impacts are typically as it relates to heat-related impacts, such as pavement and rail tracks expanding and buckling. As groundwater supply is depleted, the sinking of the ground (subsidence) can occur, sometimes leading to sinkholes, affecting infrastructure, including roads. Drought also increases the risk of wildfire, the smoke from which can severely affect visibility and result in road and airport closures. |
|  *Water Sanitation/ Supply* | High | Droughts reduce the availability of water, and therefore drinking water supply. If prolonged, competition over water resources (e.g., irrigation, drinking water, etc.) can trigger water restrictions. Low water flow can result in decreased sewage flows and subsequent increases in contaminants in the water supply. At the same time, sanitation systems operate at reduced efficiency as sediment accumulation increases, reducing reservoir safety of drinking water. Subsidence resulting from groundwater depletion can harm water sanitation and supply lines. |

## C. Extreme Winter

Extreme winter conditions occur when the temperature is unusually lower than average for prolonged periods of time, often accompanied by high winds and heavy snow (e.g., extreme cold, blizzards, ice storms, etc.). Extreme cold events are typically caused when a Polar Vortex of low pressure and cold air moves out of its usual path near Earth's poles. The rate of winter event is increasing as the impacts of climate change continue to disrupt regular weather patterns.[30]

Figure 12 depicts the National Weather Service Wind Chill Chart. Like the Heat Index, the Wind Chill Chart is a more accurate depiction of actually perceived temperature, or "wind chill temperature," by integrating air temperature and wind speed. The Wind Chill Chart outlines the safe amount of time to stay outside before frostbite ensues.[31]

**Figure 12. National Weather Service Wind Chill Chart.**




## Climate Projection: Extreme Winter

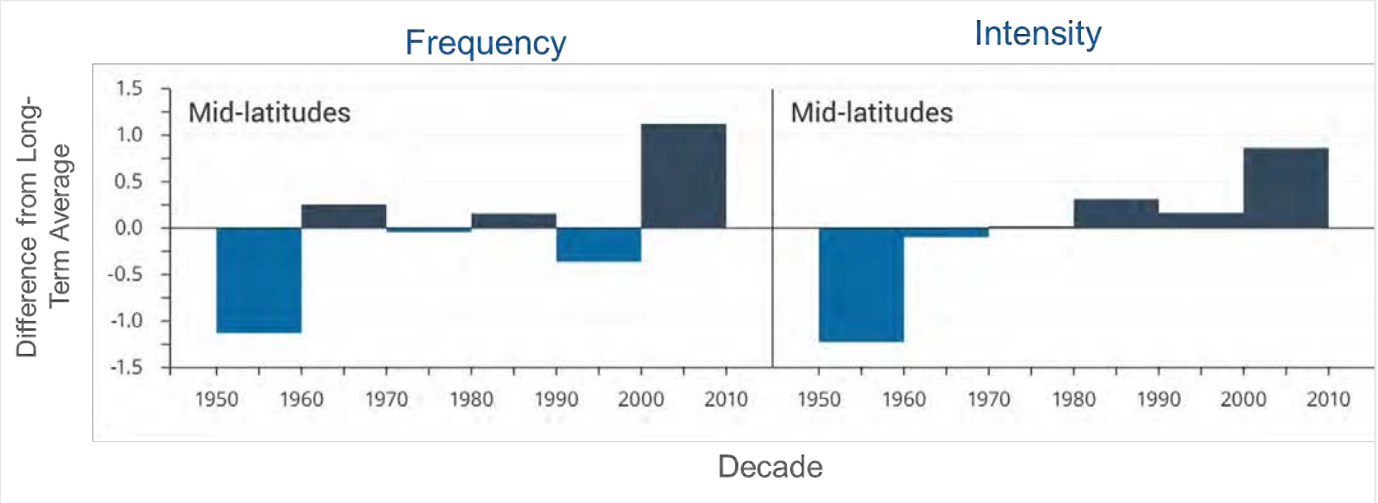
While the increase in average temperature is projected to result in fewer days below freezing and milder winters, the frequency of extreme winter conditions and events in the region is increasing. Warmer temperatures create more moisture in the atmosphere leading to greater intensification of winter storms.

[30] National Oceanic and Atmospheric Administration, Unites States Department of Commerce (2019). The science behind the polar vortex: You might want to put on a sweater. https://www.noaa.gov/multimedia/infographic/science-behind-polar-vortex-you-might-want-to-put-on-sweater

[31] National Weather Service (n.d.). Wind Chill Chart. https://www.weather.gov/safety/cold-wind-chill-chart

Historically, the County experiences about 94 days per year where the minimum temperature is below 32°F.[32] Due to rising global temperatures, the number of cold days is expected to decrease. A study conducted by U.S. Global Change Research Program found that both the frequency and intensity of winter storms in the mid-latitude regions are increasing relative to the long-term average, as seen in Figure 13.[33] This trend is forecasted to continue in coming decades.

**Figure 13. Variation of storm frequency and intensity during the cold season (November – March) in mid-latitude regions.[34]**




## Past Impacts

Winters in Prince George's County are cold and moderately snowy, with approximately 90 days per year where the nighttime low temperature is below freezing. December to February are the coldest months of the year, with lows in the high 20s. January is the snowiest month of the year, with an average of about 6 inches of snowfall; the County sees an average of 14 inches of snow per year.[35]

[32] U.S. Federal Government (2020). U.S. Climate Resilience Toolkit Climate Explorer. https://crt-climate-explorer.nemac.org/

[33] U.S. Global Change Research Program (2018). Impacts, Risks, and Adaptation in the United States: Third National Climate Assessment. https://nca2014.globalchange.gov/report/our-changing-climate/changes-storms

[34] Ibid.

[35] Best Places (n.d.). Climate in Prince George's County. https://www.bestplaces.net/climate/county/maryland/prince_george's

The County occasionally experiences winter storms, with a number of notable storms in the past couple of decades. According to the Maryland Hazard Mitigation Plan, more deaths were attributed to winter storms in the state than any other hazard in the Hazard Identification Risk Assessment.[36]

### WINTER STORM HIGHLIGHT

A winter storm in February of 2021 brought ice and freezing rain to much of the mid-Atlantic region; Prince George's County was under an ice storm warning. Ice weighed down trees and power lines causing downed power lines and damaged electrical equipment. Dominion Energy reported nearly 290,000 customers were left without power, and the restoration effort took multiple days. One COVID-19 vaccination site in the County was forced to close early.

**Figure 14. Downed powerlines resulting from the ice storm (WUSA9).**

## Vulnerability

Extreme winter conditions and events pose significant threats to residents, homes, businesses, and critical infrastructure and facilities. Vital community services can be interrupted as a result of extreme winter causing a power outage or pipe burst in a critical facility.

The following sections elaborate on populations and infrastructure vulnerable to extreme winter in Prince George's County.

### *Vulnerable Populations*

| Exposure |
|---|
| Residents who remain outdoors for prolonged periods of time (e.g., outdoor workers and people experiencing homelessness) face greater exposure to cold temperatures making them more at-risk of hypothermia, frostbite, and other cold-related illnesses. |
| **Sensitivity** |
| The elderly, young children, people with chronic illnesses or other health conditions that limit the ability to thermoregulate are more susceptible to cold-related illnesses. |
| **Adaptive Capacity** |
| As with extreme heat, people of color are more likely to have existing health disparities as a result of historical and structural patterns of inequity, marginalization, and discrimination, making them more susceptible to cold-related illnesses. Extreme cold disproportionately impacts lower income |

[36] Maryland Emergency Management Agency (2016). State of Maryland 2016 Hazard Mitigation Plan. https://mema.maryland.gov/community/Documents/2016_Maryland_Hazard_Mitigation_Plan_final_2.pdf

communities who are more likely to have inefficient heating systems, improperly insulated homes or be energy burdened (i.e., little to no financial security to afford stable heating), as seen in Figure 8. In many cases, energy-burdened households resort to unsafe heating practices such as running a generator, gas stove, or using a barbecue or fire inside their house, which can cause fires or carbon monoxide poisoning.

### *Vulnerable Infrastructure*

Prolonged freezing temperatures, ice, and snowstorms pose notable threats to homes, businesses, and critical infrastructure and facilities. In buildings, heavy snow and ice accumulation can cause roof collapse and other structural damage. Rail lines can crack or break under prolonged sub-freezing conditions, especially along older tracks with existing wear and tear.[37]Damage to electrical utility equipment and powerlines, particularly overhead lines near trees, can face substantial damage or be brought down, resulting in power outages or energy service interruptions. Additionally, sub-freezing temperatures can cause pipes to expand and burst. Aging water infrastructure is even more vulnerable to extremely cold conditions.

## Risks & Impacts

Though average temperatures are increasing causing milder winters overall, extreme winter conditions and events are projected to increase in frequency and intensity. This will in turn likely increase the prevalence of cold-related illnesses and other adverse impacts to the County's assets, systems, and populations. Extreme winter can increase the likelihood that resiliency thresholds are exceeded.

The Table below summarizes impacts to key systems and sectors in Prince George's County.

| ***Systems/Sectors*** | ***Impact Magnitude*** | ***Description*** |
|---|---|---|
| *Energy/ Utilities* | High | The increasing frequency and intensity of winter storm events may impact utility buildings and equipment such as power generation stations, substations, towers, or electrical transformers, and limit access to the facilities for operations and management staff as with increasing frequency and severity. Snow and ice can accumulate on trees and power transmission lines, resulting in damage to the electric system and likely cause power outages to homes, businesses, and critical facilities for longer periods of time. Damage to above-ground utilities, which are more prevalent in older neighborhoods and EEA areas, may disproportionally affect vulnerable populations. Undergrounded utilities, while protected from the elements, may give false sense of security if above-ground interconnections are not addressed. After several severe winter storms, the Potomac Electric |

[37] Keolis (n.d.). Broken Rails. https://www.keoliscs.com/broken-rails/

| | | |
|---|---|---|
| | | Power Company (PEPCO) updated its power restoration response procedures.[38] |
|  *Public Health* | Moderate | Extreme cold inhibits the body's ability to warm itself effectively; overexposure may result in frostbite and hypothermia, which can lead to death. Hazardous road conditions during winter storm events increase the rate of automobile accidents. Frozen precipitation can make sidewalks slippery and can result in injuries if a resident slips and falls. Communities may face increased delays for longer periods of time to emergency response or medical services due to transportation failures and/or electric service interruptions for longer periods of time. When residents resort to unsafe heating practices (e.g., generator, indoor fire, gas stove), either during longer periods of power outage or otherwise, the risk of household fires and carbon monoxide poisoning may increase. |
|  *Commercial/ Economy* | Moderate | Disruption to business operations can occur when employees are unable to travel or in the event of a prolonged power outage. Frozen water pipes can cause substantial damage to a home or business and will likely require costly repairs. If severe ice or snow conditions reduce road capacity, shipment deliveries can be delayed. Weather-related delays are estimated to cost trucking companies between $2.2 to $3.5 billion annually.[39] These impacts are expected to increase with increased winter storm frequency and intensity. |
|  *Transportation* | Moderate | Snow and ice accumulation can create unsafe road conditions, resulting in traffic delays, road closures, and automobile accidents. Extreme cold can cause railway infrastructure to crack or break. Rail lines can be up to 5 degrees colder than the air temperature, creating tension in the steel.[40] Electrified rails will temporarily shut down above-ground operations if more than 6 inches of snow is accumulated.[41] Air travel may be delayed or canceled if winter conditions make flight activity unsafe. |
|  | Moderate | Sub-freezing conditions can cause water mains to freeze and therefore expand and burst. If this occurs, a home, business, or |

[38] Prince George's County Office of Emergency management (2017). Prince George's County & the City of Laurel Hazard Mitigation Plan Update. https://www.princegeorgescountymd.gov/sites/default/files/media-document/dcv29942_2017-pgc-hazard-mitigation-plan-update_adopted.pdf

[39] U.S. Department of Transportation, Federal Highway Administration (2014). How Do Weather Events Impact Roads? www.ops.fhwa.dot.gov/weather/q1_roadimpact.htm

[40] Keolis (n.d.). Broken Rails. https://www.keoliscs.com/broken-rails/

[41] National Protection Programs Directorate, Homeland Security (2014). Critical Infrastructure Security and Resilience Note: Winter Storms and Critical Infrastructure. https://www.npstc.org/download.jsp?tableId=37&column=217&id=3277&file=OCIA_Winter_Storms_and_Critical_Infrastructure_141215.pdf

| | | |
|---|---|---|
| *Water Sanitation/ Supply* | | critical facility can be without water service from several hours to several days. For example, in early January of 2014, Prince George's County Fire/EMS Department received over 2,000 calls regarding frozen or broken water pipes in homes and businesses across the County.[42] Heavy snow accumulation coupled with rainfall can overwhelm storm drains resulting in localized flooding. This is of particular concern in heavily urbanized areas.[43] Water supply can also be stressed as ice, or frozen slush can restrict intake by blocking valves. |

[42] Belt, D. (2014). Cold Maryland: Concerned About Freezing Pipes? https://patch.com/maryland/silverspring/cold-maryland-concerned-about-freezing-pipes_2cd8fa4b-silverspring

[43] University of British Columbia Okanagan campus (2020). https://www.sciencedaily.com/releases/2020/02/200205132345.htm

## D. More Frequent Flooding Events

While flooding is a natural phenomenon, the increase in impervious surfaces including parking lots and roads, as well as the infringement on rivers and floodplains increases the potential for flooding and the cost of flood damage. Flash and riverine flooding, which typically follow extreme precipitation events, are the two main types of flooding in Prince George's County. The County is also susceptible to coastal flooding from sea level rise, storm surge, and high tide. As sea levels rise and extreme precipitation events become more frequent, the County is projected to experience more frequent flooding events.

This section outlines the climate projections, vulnerabilities, and risks and impacts for inland flooding/extreme precipitation and coastal flooding.

### *A. Inland Flooding & Extreme Precipitation*

Flooding is a temporary increase of water levels on land that is normally not submerged. It can occur along a river channel or stream when excessive rainfall surpasses the river's capacity, known as riverine flooding. Prince George's County is surrounded by two main rivers: the Patuxent River to the east and the Potomac River to the west. Flash flooding refers to instances of inundation resulting from heavy precipitation over a short period of time or in the event of a dam or levee failure. [44] Flooding is most common in low-lying areas and in heavily urbanized zones where the ground is largely covered by impervious surfaces, such as in North County, Upper Marlboro, the City of Laurel, Oxon Hill, Landover, and Joint Base Andrews.[45]

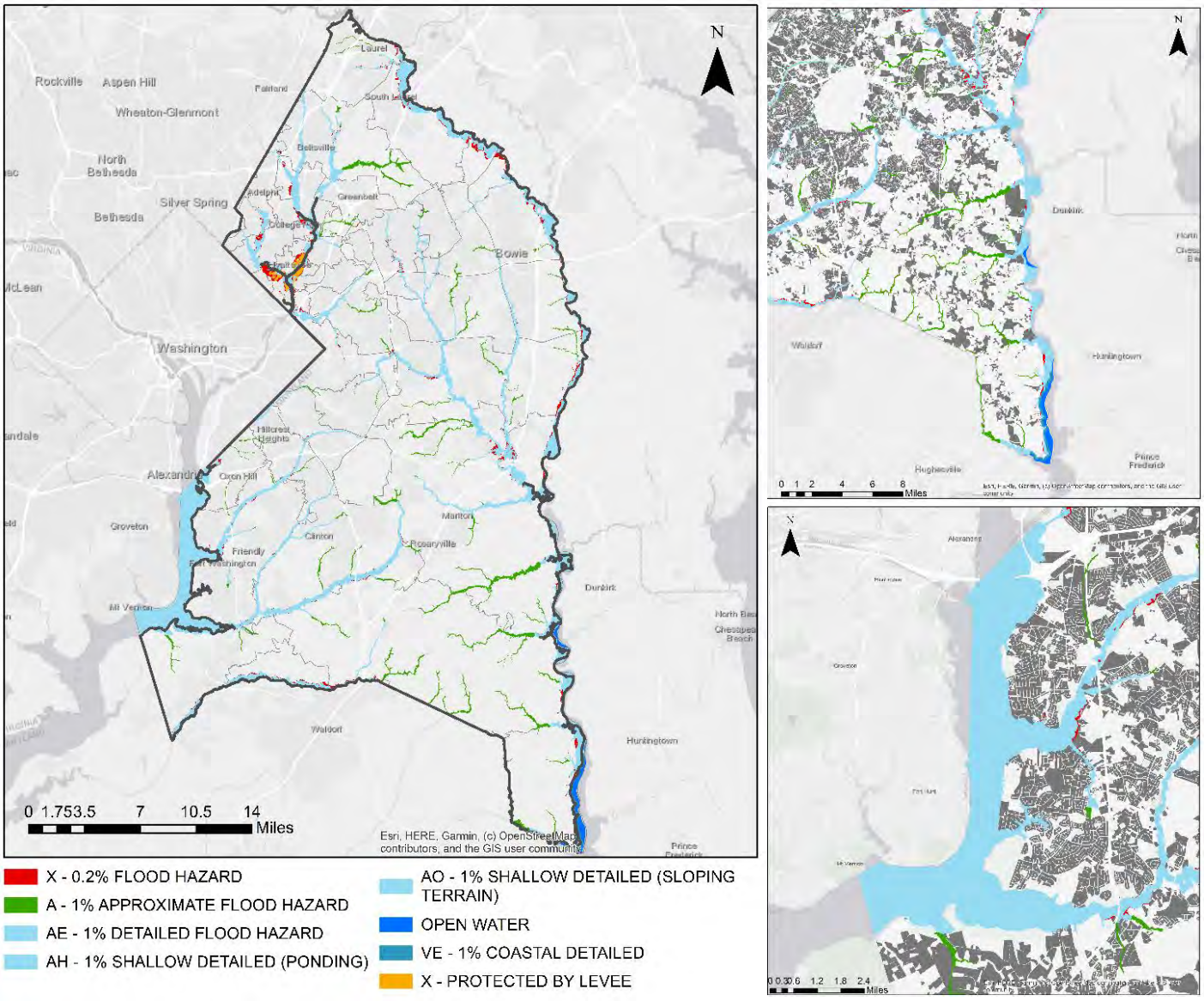
According to the 2017 Prince George's County Hazard Mitigation Plan, nearly 11% of the total County area is located within the 100-year FEMA floodplain,[46] of which 0.6% is located either within the 500-year floodplain or at risk of levee failure. Figure 15 demonstrates the current FEMA floodplain in Prince George's County and alongside the Patuxent and Potomac Rivers. Full-length maps are available in 0.

[44] Low-Impact Development Center (LIDC)'s 'nuisance' flooding reports – which are intended to analyze both 'nuisance' flooding from flash and riverine sources as well as coastal flooding impacts in Prince George's County – have been submitted for approval, but were not available at the release of this Report.

[45] It should be noted that data on impervious surfaces is insufficient to provide sufficient guidance as to which areas of the County may be urbanizing, which itself presents a risk.

[46] Data is included for FEMA floodplains as currently defined at publication. FEMA floodplain maps currently only account for historical conditions, and have not been updated to reflect climate change projections. Floodplain designations are subject to modification and expansion. County should coordinate and reassess periodically.

**Figure 15. Floodplains in Prince George's County (Left), near the Patuxent River (Top, Right), and near the Potomac River (Bottom, Right).**



## Climate Projection: Inland Flooding & Extreme Precipitation

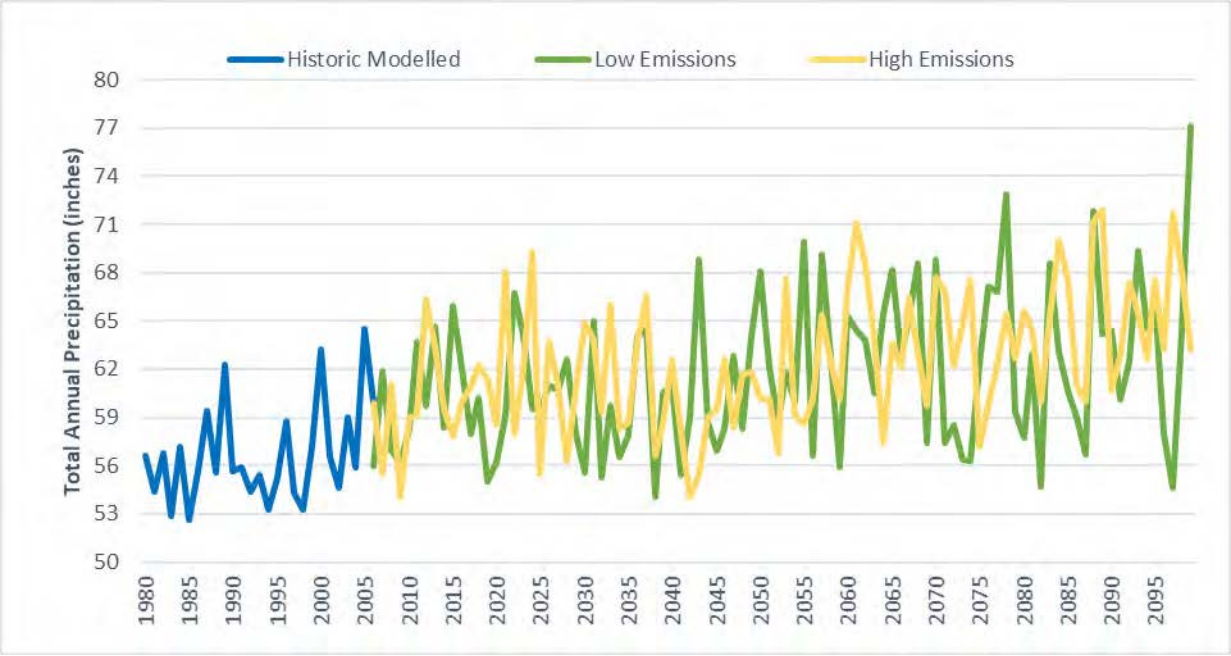
Climate models show warming temperatures are increasing the rate of evaporation, intensifying the water cycle, and increasing the frequency and intensity of extreme precipitation events in most locations. In the region, extreme precipitation events have increased by 27% from 1958 to 2016.[47]

### *Increasing Average Precipitation*

While precipitation models are less certain than temperature projections, forecasts show a sustained rise in annual precipitation. The historic baseline average of annual maximum precipitation from 1980 – 2006 in the County is approximately 56 inches. As illustrated in Figure 16, this average is projected to steadily increase to roughly 62 inches by 2040, and up to 67 inches by 2060, a 10 and 60% increase respectively.[48]

Extreme precipitation can overwhelm stormwater drainage infrastructure or overflow rivers and streams, further contributing to flooding.

**Figure 16. Total annual maximum precipitation projection for Prince George's County. (U.S. Climate Resilience Toolkit Climate Explorer).**




[47] U.S. Global Change Research Program (2017). Climate Science Special Report: Precipitation Change in the United States. https://science2017.globalchange.gov/chapter/7/

[48] U.S. Federal Government (2020). U.S. Climate Resilience Toolkit Climate Explorer. https://crt-climate-explorer.nemac.org/

### *High Water Tables*

With this projected increase in precipitation, the County will experience more frequent incidents of elevated groundwater levels, an already chronic issue in the County and the source of one of the most frequently cited drainage complaints. Without proper infiltration, excess stormwater may reach the water table, raising the water table. High groundwater levels can cause persistently wet basements and yards, septic system failure, crop destruction, and health concerns from standing water.

High water tables are more common in low-lying areas that receive excess water from higher elevations.

## Past Impacts

The County frequently experiences flooding events, many of which have caused substantial property damage. Between 1996 and 2016, 33 historical flood events were recorded, with an average of $14,200 in total damages per year.[49] From 2018-2021, there were 4,362 complaints to the County's 311 hotline that were water-related, including: flooded basements, backyards, streets, and sinkholes.[50]

### EXTREME PRECIPITATION HIGHLIGHT

In September of 2020, Prince George's County experienced historic flash flooding after a series of severe thunderstorms brought heavy rain to the region.

Substantial flooding occurred across the County, especially in low elevated areas, like along Route 50 (Figure 17), which flooded with over 5 feet of impassable water. Emergency responders were called to rescue residents trapped in vehicles. Additionally, many homes experienced substantial property damage, such as in North Brentwood, Mount Rainier, and Riverdale, among others.

**Figure 17. Flooding on Route 50, September 2020. (WTOP/Dave Dildine)**

[49] Prince George's County Office of Emergency management (2017). Prince George's County & the City of Laurel Hazard Mitigation Plan Update. https://www.princegeorgescountymd.gov/sites/default/files/media-document/dcv29942_2017-pgc-hazard-mitigation-plan-update_adopted.pdf

[50] Prince George's County Department of the Environment (2021). Countywide Drainage Complaints February 2018 through February 2021. Motorola Data not including 911 calls.

### HIGH WATER TABLES HIGHLIGHT

Drainage issues as a result of high water tables are a reality many homeowners across the County face. High water levels can result in the intrusion of groundwater into basements or water being trapped and ponding in yards, like in Figure 19. High water tables can interfere with the septic system, causing premature failure and sewage backup inside homes.

**Figure 18. Saturated soil resulting from high water table (Department of the Environment).**

## Vulnerability

Flood vulnerability is influenced by a number of factors, such as land elevation, duration of the precipitation event, volume of runoff, velocity of flood waters, land use type, and percentage of impervious surfaces, among others. While residences, buildings, and facilities located in the floodplains are most exposed, the risk of flooding is far-reaching.

The following sections elaborate on populations and infrastructure vulnerable to inland flooding and extreme precipitation in Prince George's County.

### *Vulnerable Populations*

| Exposure |
| --- |
| Residents living in low elevation areas, within floodplains, and/or near riverbanks are more exposed, and therefore vulnerable, to flooding. |
| **Sensitivity** |
| Sensitive populations include residents who may require special assistance to evacuate or relocate, such as those with mobility impairments, physical or cognitive disabilities, or those dependent on caretakers. |
| **Adaptive Capacity** |
| Adaptive capacity heavily influences an individual or community's vulnerability to flooding. For example, a well-socially connected community is a more resilient community as residents are in closer contact and therefore better able to assist one another evacuate or check in on vulnerable neighbors. Additionally, economic conditions play a significant role in an individual's ability to protect and recover from flooding. Lower-income residents, such as those living in EEAs, are more likely to lack the financial means to protect their homes before flooding and cover the cost of damage after flooding occurs. Of the County's 118 EEAs, 85 are located in the floodplain. Similarly, residents living in substandard housing conditions are at greater risk of flood damage. |

### *Vulnerable Infrastructure*

Flooding can result in substantial property damage to homes, businesses, and critical infrastructure and facilities. Damages can range from superficial damage such as loosening floorboards, damaged siding, and molding in basements and crawlspaces to more indelible damage such as harming appliances and other electrical equipment, cabling, and conduits. Compromising of the building's structural integrity is also a concern from undermining of foundations, floors, and stairs; damage to structural elements such as beams, columns, walls, and roofs; resulting in cracking, differential settlement, and reduced or inoperability of windows, doors, and other critical life safety egress openings.

To characterize flood vulnerability across the state, researchers at Maryland Department of Environment and Salisbury University modeled the amount of direct potential economic losses to buildings from 100-year flood events. Prince George's County had the most significant potential losses at $1.28 billion, or 15% of the state total. The study also indicated that Prince George's County is among the top counties for greatest number of buildings which may be potentially damaged by future 100-year flood events.[51]

Cadmus conducted a GIS analysis of properties that intersect the FEMA floodplain to better understand the magnitude of structures most exposed to flooding. In Prince George's County, nearly 9,000 structures, or about 4% of the total stock, are located within the FEMA floodplain.[52] Residential properties represent the greatest number of structures within the floodplain. Table 5 breaks this figure down by land use type. While 60% of properties in the floodplain are single-family homes, they cover only 16% of the total acreage. The Table also includes the extent of County-owned properties located in the FEMA floodplain; more than 500 of the properties located in the floodplain are County-owned. Table 6 lists critical infrastructure located in the floodplain.

**Table 5. Number and types of buildings located in the current FEMA floodplain (M-NCPPC, GIS Data Catalog).**

| Land Use Type[53] | # of Properties | % Properties | Acres | % Acreage |
|---|---|---|---|---|
| Residential (Single Family) | 5,419 | 60.4% | 9,930.5 | 16.4% |
| Residential (Multi-Family) | 125 | 1.4% | 1,026.5 | 1.7% |
| Residential (Townhouse) | 345 | 3.8% | 464.8 | 0.8% |
| Residential (Attached) | 866 | 9.7% | 84.3 | 0.1% |
| Transportation and Utilities | 290 | 3.2% | 4,737.5 | 7.8% |

[51] Joyce J. and Scott M. (2005). An Assessment of Maryland's Vulnerability to Flood Damage. https://www.researchgate.net/publication/237388828_An_Assessment_Of_Maryland's_Vulnerability_To_Flood_Damage

[52] Data is included for FEMA floodplains as currently defined at publication. FEMA floodplain maps currently only account for historical conditions and have not been updated to reflect climate change projections. Floodplain designations are therefore subject to modification and expansion. County should coordinate and reassess periodically.

[53] Database last updated in April 2018.

| | | | | |
|---|---|---|---|---|
| Commercial (including Offices) | 455 | 5.1% | 3,131.6 | 5.2% |
| Industrial | 409 | 4.6% | 1,632.7 | 2.7% |
| Institutional (including Churches) | 690 | 7.7% | 19,706.6 | 32.5% |
| Other[54] | 375 | 4.2% | 19,844.9 | 32.8% |
| **TOTAL** | **8,974** | | **60,559.5** | |
| **County-Owned Properties** | **535** | **6%** | **7,270** | **12%** |

**Table 6. Critical infrastructure and buildings located in the current FEMA floodplain (Planning Department).**

| Infrastructure Type | Total Structures | Within Floodplain |
|---|---|---|
| Hospitals | 9 | 0 |
| Day Care Centers | 1144 | 16 |
| Schools | 377 | 2 |
| Fire Stations | 97 | 4 |
| Police Stations | 10 | 0 |
| Libraries | 44 | 1 |
| Senior Housing | 65 | 0 |
| Senior Activity Center | 6 | 1 |
| Recreation Center / Community Center | 66 | 11 |
| Historic Sites | 544 | 39 |
| Rail Transit Stops (Existing and Proposed) | 31 | 0 |
| **TOTAL** | **2393** | **74** |

Prince George's County is currently working with FEMA and the Maryland Department of the Environment to update flood hazard mapping.[55] The updated floodplains are expected to cover a greater area within the County, therefore containing additional properties and critical infrastructure than accounted for in this analysis.

The number of at-risk properties is expected to increase by 4.4% over the course of the next 30 years relative to current standings, resulting in an estimated $15.8 million of annual flood damage, an 18% increase from today.[5657] The number of at-risk properties is expected to grow with the increase in amount and frequency of extreme precipitation events, in addition to expansion of the floodplain.

[54] "Other" includes: Mixed-Use and Agricultural (Natural Resources).

[55] Prince George's County (2019). Hazard Mitigation Plan Status of Mitigation Actions to Address Flood Hazards. https://www.princegeorgescountymd.gov/sites/default/files/media-document/dcv29943_510-progress-report_prince-georges_2019.pdf

[56] Flood Factor (n.d.). Flood risk is increasing for Prince George's County. https://floodfactor.com/county/prince-george's-county-maryland/24033_fsid#summary

[57] Flood Factor (n.d.). Flood risk is increasing for Prince George's County. https://floodfactor.com/county/prince-george's-county-maryland/24033_fsid#summary

Larger infrastructure such as levees, which protect more than 2,000 buildings from riverine flooding, may be overtopped or fail due to increased pressure from extreme precipitation and flooding, leading to interior (inland) flooding.[58] For high hazard dams, Prince George's County has identified a need to revisit approved dam breach analyses to account for projected precipitation increases and related increased risks to downstream communities.[59]

## Risks & Impacts

As climate change intensifies and increases the frequency of inland flooding events, an increased number of assets, systems, and populations may be affected. Inland flooding can cause pose serious risk to lives and property and increase the likelihood that resiliency thresholds of vital services and systems are exceeded.

The Table below summarizes impacts to key systems and sectors in Prince George's County.

| *Systems/Sectors* | *Impact Magnitude* | *Description* |
|---|---|---|
| *Energy/ Utilities* | Moderate | Extreme precipitation flooding may impact an increasing number of utility buildings and equipment such as power generation stations, substations, towers, or electrical transformers, and limit access to the facilities for operations and management staff. Power lines, towers, or trees may be felled, and/or equipment damaged, potentially resulting in power outages. Damage to above-ground utilities, which are more prevalent in older neighborhoods and EEA areas, may disproportionally affect vulnerable populations. Undergrounded utilities, while protected from the elements, may give false sense of security if at-risk above-ground interconnections are not addressed. |
| *Public Health* | High | Adverse health impacts associated with flooding and extreme precipitation may include disaster-related deaths (e.g., drowning) and indirect disaster-related deaths (e.g., disruption of utility or medical care services); mental health impacts before, during, and after flooding (e.g., evacuation, population displacement); exposure to mold; and possible outbreaks of water-borne diseases. In the event of a power outage, air conditioning or heating systems may stop operating for long periods of time aggravating heat- or cold-related illnesses. Inoperable elevators may prevent those with limited mobility from evacuating, and lack of lighting may result in more accidents or falls. |

[58] Levees identified in descending order of priority are: Anacostia Levee Improvements, Northeast Branch - East West Highway, Northeast Branch – Bladensburg, Oxon Run - Forest Heights, Beaverdam – Landover, Paint Branch - Cherry Hill Road, Indian Creek - U.S. Route 1, Northwest Branch - East West Highway. https://www.princegeorgescountymd.gov/departments-offices/environment/sustainability/flood-management/countywide-flood-damage-reduction-strategies

[59] Prince George's County Office of Emergency management (2017). Prince George's County & the City of Laurel Hazard Mitigation Plan Update. https://www.princegeorgescountymd.gov/sites/default/files/media-document/dcv29942_2017-pgc-hazard-mitigation-plan-update_adopted.pdf

| | | |
|---|---|---|
| | | In the event of downed power lines, live exposed wires can pose the life-threatening risk of electrocution. |
|  *Commercial/ Economy* | High | Flooding can cause substantial property damage to local businesses, lower property value, more and longer breakdowns of supply and distribution chains, increased business interruption, and limit access to commercial buildings with greater frequency. Relief and recovery efforts costs, which are already high, are expected to increase with increased severity with the increasing frequency and intensity of extreme precipitation events, negatively impacting local and regional investments in infrastructure and other development. Recurring and increasing periods of flooding may disincentivize private and public investment in disaster-prone areas, further crippling the local economy. Commuting workers may be increasingly displaced for longer periods of time if flood disrupts transportation systems, causing significant wage losses. |
|  *Transportation* | High | Roads and other transportation systems are expected to flood more frequently and with increased severity. More roads may be impassable and road closures may last longer. Major intersections, especially those that have flooded in the past or flood frequently, are of particular concern.[60] |
|  *Water Sanitation/ Supply* | Moderate | Extreme precipitation events may impact an increasing number of water / wastewater buildings and equipment (e.g., treatment plants, pumping stations) and limit access to the facilities for operations and management staff. Heavy precipitation may damage or overtax toxic waste sites, with flood waters spreading waste and effluent from brownfields or Superfund sites to surrounding areas. High water tables (i.e., the level at which soil is saturated with groundwater) and problematic soils conditions have been identified as a key concern in the County.[61] In low-lying areas and/or areas where soil is not well drained, high water tables can cause premature failure of septic systems and sewage backup.[62] Rainfall, wind, and runoff can affect the turbidity level of water in the watershed area, which can negatively impact the disinfection process of drinking water. Undersized storm drainage systems may be increasingly strained during extreme precipitation events and are a key concern in many locations. A 2020 vulnerability assessment of Duckett Dam assessed a 2065 100-yr flood and found that, while the dam itself is structurally stable, its pumping station need infrastructural upgrades to avoid disruption of potable water services.[63] |

[60] Major intersections include: Rte. 50 / I-295 intersection, as well as other low-lying locations in the floodplain such as I-295 at Oxon Creek, Route 210 at Piscataway Creek, Croom Rd. (Rte. 382) at Black Swamp Creek, Full Mill Branch, Mataponi Creek (and other creek intersections), Rte. 4 / Rte. 408 at Patuxent River, Rte. 50 / Rte. 301 / N. Crain Hwy. (Rte 3) at Patuxent River, Baltimore Ave / Bladensburg Rd. / Rte. 202 at Anacostia River.

[61] See also 'Drought: Vulnerable Infrastructure" for discussion of highly problematic soils conditions.

[62] For example, in 2019, a wastewater pipe overflowed for approximately 12 hours spilling more than 5 million gallons of sewer water into Broad Creek in the Fort Washington area. https://wtop.com/prince-georges-county/2019/08/5-22-million-gallons-of-sewer-water-overflows-into-prince-georges-co-s-broad-creek/

[63] Climate Resilience and Vulnerability Assessment (CRVA) workshop findings, April 16, 2021.

## *B. Coastal Flooding*

Located between the tidally influenced Patuxent and Potomac Rivers, Prince George's County is at risk of coastal flooding from sea level rise, storm surge, tidal flooding from high tide. The three main causes of coastal flooding are as follows:

- **Sea level rise** is the increase in global ocean levels as a result of melting sea ice and expansion of seawater as it warms**.** Sea level rise is correlated with land subsidence. In coastal areas, sinking land, known as subsidence, leads to higher sea-level, increasing the flood risk.[64]
- **Storm surge** occurs when high winds from hurricanes, tropical storms, or other coastal storms force water ashore.
- **Tidal flooding** occurs in the event of exceptionally high tides.

The global rise in sea level is largely due to sea ice melting and thermal expansion of seawater as temperatures warm. Even a small and seemingly insignificant rise in sea level can pose serious threats by contributing to storm surge and high tides and making rare flood events more common. Figure 19 maps projected sea level rise in Prince George's County.[65] The southern areas along the two rivers, such as Fort Washington, Aquasco, and Eagle Harbor, are anticipated to be most impacted by sea level rise and coastal flooding. Full-length maps are available in Appendix D.

### Climate Projection: Coastal Flooding

#### *Increasing Sea Level Rise*

As global temperatures rise, sea ice is melting at unprecedented rates, contributing to a global rise in sea level. Over 65% of coastal floods in the Prince George's County area have occurred as a result of climate change-driven sea level rise. That is, from 1950 to 2016, a tide station at the U.S. Naval Academy recorded 915 days that have exceeded local National Weather Service flood thresholds, yet only 288 were not caused by climate- related sea level rise, Figure 20.

Figure 21 illustrates the projected sea level rise based on data collected from a U.S. Naval Academy water level station, 22 miles from Prince George's County.[66] Based on the National Climate Assessment "intermediate-high sea level rise scenario," sea level is expected to increase to 1.5 feet by 2040 and 2.4

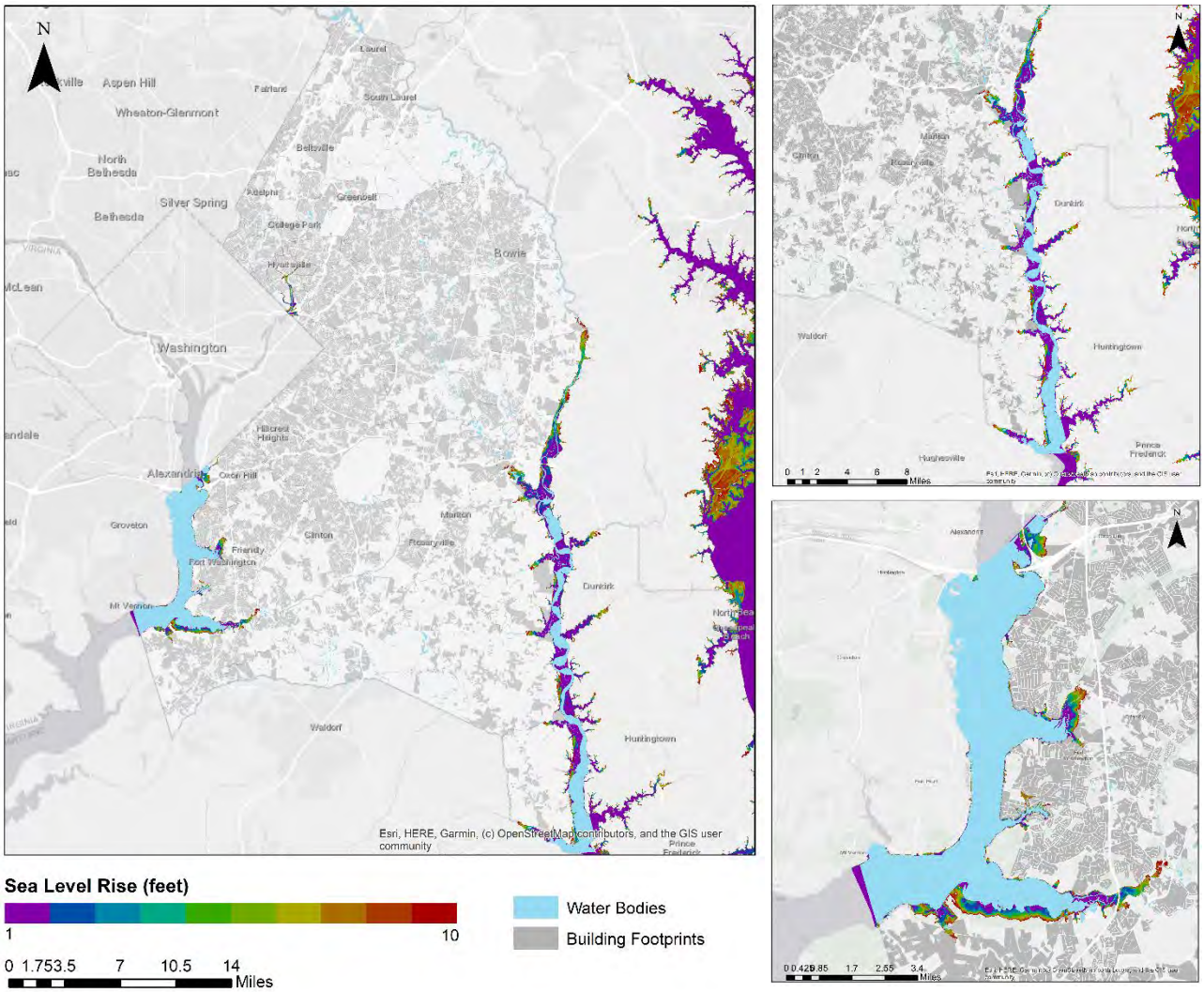
[64] https://sealevel.nasa.gov/understanding-sea-level/regional-sea-level/subsidence

[65] Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), Office for Coastal Management (OCM) 2017 Charleston, SC NOAA's Ocean Service, Office for Coastal Management (OCM) https://coast.noaa.gov/slrdata

[66] Analysis uses median local sea level projections based on the intermediate high scenario from NOAA Technical Report NOS CO-OPS 083 (2017), intended for the 2018 U.S. National Climate Assessment. Sea level rise is relative to a 1992 baseline.

feet by 2060, relative to a 1992 baseline, and by over 4.5 feet by the end of this century, significantly increasing the risk and impacts of coastal flooding.[67]

**Figure 19. Projected sea level rise in Prince George's County (Left), near the Patuxent River (Top, Right), and near the Potomac River (Bottom, Right). (NOAA).**




[67] Surging Seas Climate Central (2016). Coastal Risks for Prince George's County, MD. https://riskfinder.climatecentral.org/county/prince-georges-county.md.us?comparisonType=county&forecastType=NOAA2017_int_p50&impact=Land&impactGroup=Land&level=6&unit=ft&zillowPlaceType=postal-code

**Figure 20. Coastal flood days in Prince George's County Area. Data pulled from a U.S. Naval Academy water level station, 22 miles from Prince George's County. (Climate Central Risk Finder).**

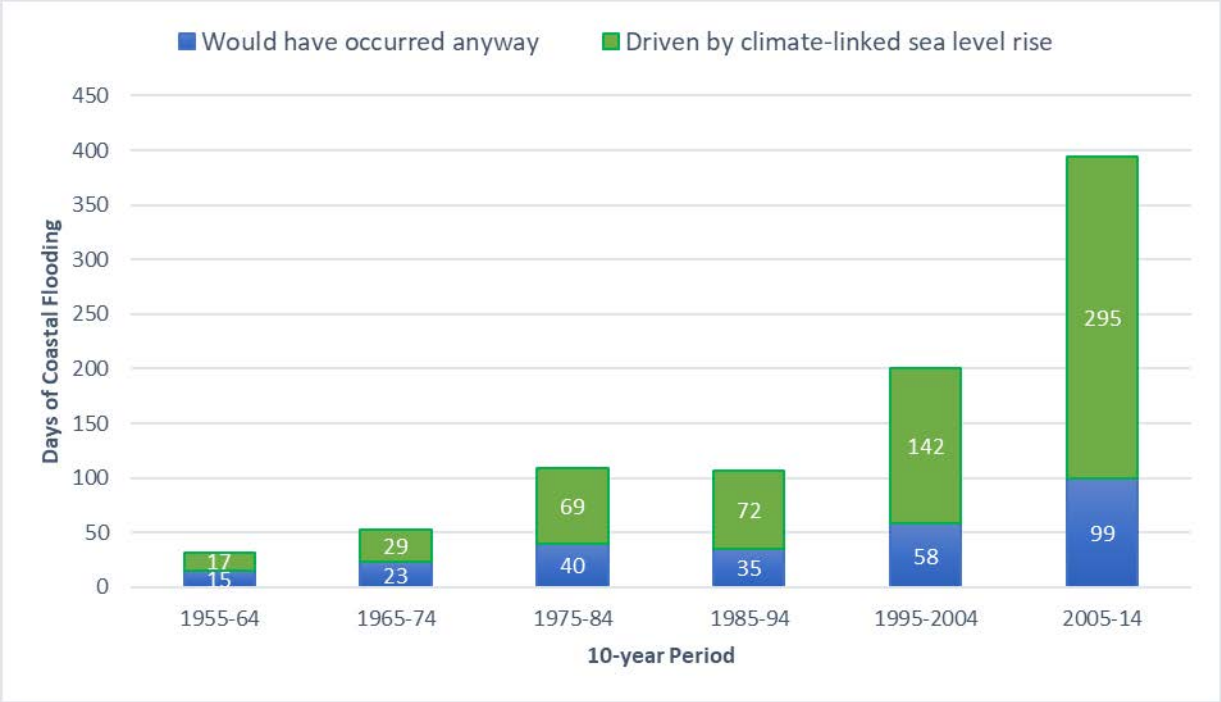
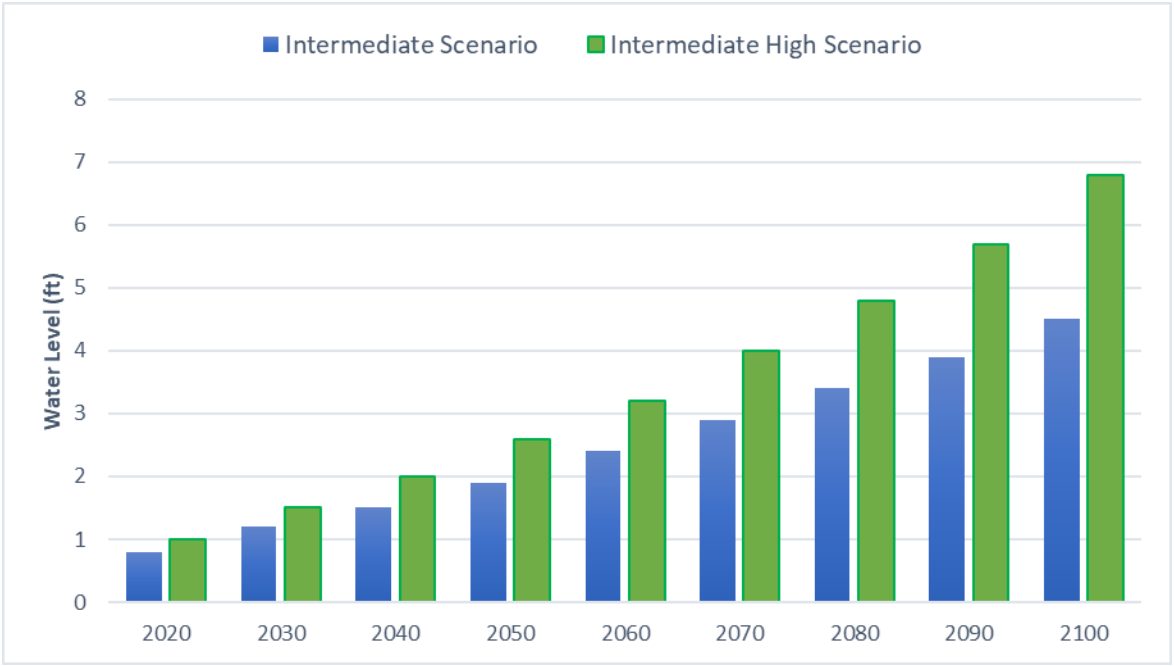


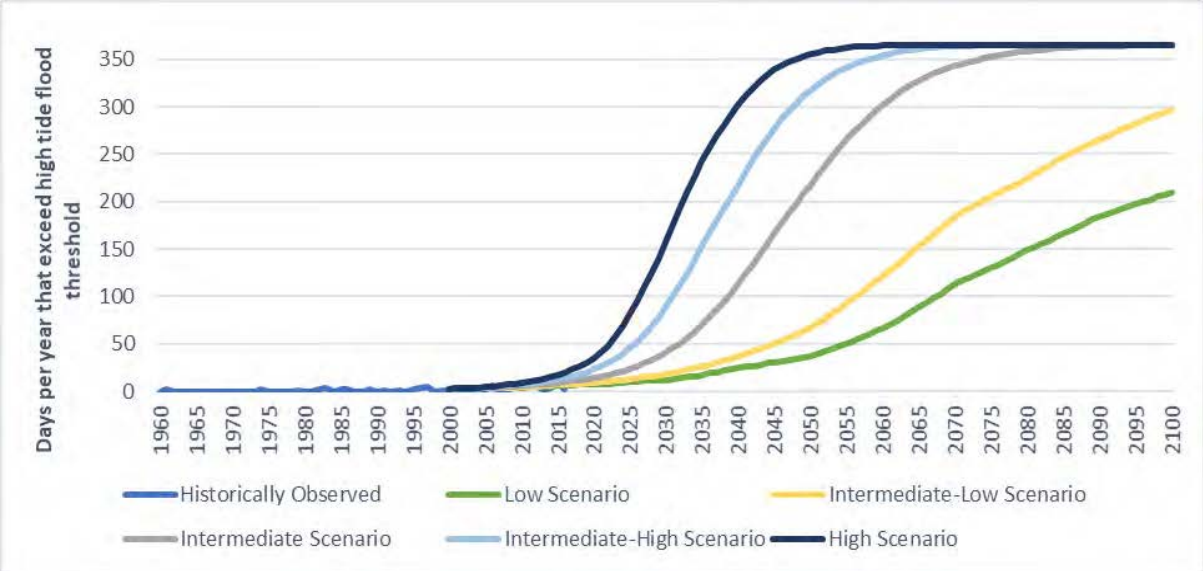

**Figure 21. Projected Sea Level Rise in the Prince George's County area (Climate Central Risk Finder).**



### *Increasing High Tide Flooding Days*

One of the most considerable climatic changes projected in the coming decades is regarding high tide flooding days. From 1980 to 2016, Prince George's County area saw an average of 2 days of high tide flooding per year. This is projected to increase significantly by the end of the century. Even under a "Low Emission Scenario", the annual days per year with high tide flooding is projected to increase to roughly 25 days by 2040 and 67 days by 2060, as seen in Figure 22.

**Figure 22. Projection of High Tide Flooding in Prince George's County Area. (Sweet, W.V., G. Dusek, J. Obeysekera, J.)**




## Past Impacts

While not as common as inland flooding, coastal flooding typically occurs as a result of tidal flooding from large storms. Neighborhoods along the tidally influenced rivers, like Fort Washington, have been identified as particular areas of concern.

## COASTAL FLOODING HIGHLIGHT

At time of writing, Prince George's County is under a Coastal Flood Watch and is preparing to experience potentially the largest tidal flooding event since Hurricane Isabel in 2003. Areas along the Potomac River are most at risk, with low-lying coastal areas expected to experience 2-4 feet of tidal inundation.

**Figure 23. Marine Watches, Warnings, and Advisories (WTOP/NWS Baltimore-Washington)**


## Vulnerability

Coastal flood vulnerability is influenced by a number of factors, such as proximity to the rivers, land use type, severity of coastal storms, land elevation, among others.

### *Vulnerable Populations*

| Exposure |
|---|
| Residents living near riverbanks or projected storm surge areas are more exposed to coastal or tidally influenced flooding and are therefore more vulnerable. |
| **Sensitivity** |
| Sensitive populations include residents who may require special assistance to evacuate or relocate, such as those with mobility impairments, physical or cognitive disabilities, or those dependent on caretakers. |
| **Adaptive Capacity** |
| Adaptive capacity heavily influences an individual or community's vulnerability to flooding. For example, a well-socially connected community is a more resilient community as residents are in closer contact and therefore better able to assist one another evacuate or check in on vulnerable neighbors. Additionally, income status plays a significant role in an individual's ability to protect and recover from flooding. Lower-income residents are more likely to lack the financial means to pre-emptively retrofit (e.g., elevate, floodproof) their homes to reduce damage and/or repair their properties in the event of significant damage. |

### *Vulnerable Infrastructure*

Buildings and infrastructure near the tidally influenced rivers are at risk of coastal flooding, sea level rise, and storm surge. Sea level rise can lead to permanent inundation of certain areas, forcing existing structures to either relocate, permanently close, or undergo stringent flood protection measures. Storm surge elevations can be much higher than pluvial and fluvial flooding, and thus have more extensive impact on buildings, infrastructure, and other assets.

Table 7 outlines how much land, buildings, and roads are exposed to potential flooding or permanent submergence within areas of the County expected to be impacted by 1, 2, and 3 feet of sea level rise. Again, the projected sea level rise by 2040 is 1.5 feet and 2.4 feet by 2060. The values listed exclude areas potentially protected by levees and other features.

**Table 7. Total land, homes, property value, and roads at risk by increments of sea level rise (Climate Central Risk Finder).[68]**

| | 1 foot | 2 feet | 3 feet |
|---|---|---|---|
| **Total land** | 1 sq. miles | 2 sq. miles | 2 sq. miles |
| **Homes** | 27 | 38 | 53 |
| **Property value (homes)** | $34 million | $49 million | $67 million |
| **Roads** | 173 miles | 434 miles | 726 miles |

Larger infrastructure such as levees, which protect more than 2,000 buildings from riverine flooding, may be overtopped or fail due to increased pressure from extreme precipitation and flooding, leading in turn to interior (inland) flooding. For high hazard dams[69], Prince George's County has identified a need to revisit approved dam breach analyses to account for precipitation increase and related increased risks to downstream communities.

The effects of sea level rise and the risks associated with higher tides and stronger storm surges have also been exacerbated by the ongoing deterioration of the natural watershed environment through urbanization and development. In the Patuxent watershed, for example, where the population has doubled, urban land use increased by 11% between 2000 and 2010 with a similar rate of increase for impervious surfaces.[70] Assuming similar trends persist, the County's resilience to coastal flooding events will continue to be negatively impacted as existing natural buffers and green infrastructure are overburdened due to increased development along the rivers. This will expose more vulnerable populations and key assets that are inadequately protected by County infrastructure that cannot keep up with the regularity and intensification of flood conditions.

## Risks & Impacts

As climate change results in rising sea level, stronger storm surge, and more high tide flooding days, coastal flooding can impact an increasing number of assets, systems, and populations. Coastal flooding

[68] Data sources include: US Census Bureau 2010, LIDAR elevation data, raw homes and property value data, and Neumann et al. (2011). The economics of adaptation along developed coastlines. http://onlinelibrary.wiley.com/doi/10.1002/wcc.90/abstract

[69] Prince George's County (2017). Hazard Mitigation Plan

[70] The Patuxent River, Maryland (2015). http://www.paxcon.org/uploads/5/7/6/6/5766937/pax_white_paper_final_-_basic.pdf

can pose serious risk to lives and property and increase the likelihood that resiliency thresholds of vital services and systems are exceeded.

The Table below summarizes impacts to key systems and sectors in Prince George's County.

| *Systems/Sectors* | *Impact Magnitude* | *Description* |
|---|---|---|
| *Energy/ Utilities* | Moderate | Coastal flooding may impact increasing numbers of utility buildings and equipment such as power generation stations, substations, towers, or electrical transformers, and limit access to the facilities for operations and management staff with increased frequency and intensity of tidal flooding events and sea level rise. Power lines, towers, or trees may be felled, and/or equipment damaged, resulting in power outages. Damage to above-ground utilities, which are more prevalent in older neighborhoods and EEA areas, may disproportionally affect vulnerable populations. Undergrounded utilities, while protected from the elements, may give false sense of security if at-risk above-ground interconnections are not addressed. |
| *Public Health* | Moderate | Adverse health impacts associated with coastal flooding may include disaster-related deaths (e.g., drowning) and indirect disaster-related deaths (e.g., disruption of utility or medical care services); mental health impacts before, during, and after flooding (e.g., evacuation, population displacement); exposure to mold; and possible outbreaks of water-borne diseases. In the event of a power outage, air conditioning or heating systems may stop operating for long periods of time aggravating heat- or cold-related illnesses. Inoperable elevators may prevent those with limited mobility from evacuating, and lack of lighting may result in more accidents or falls. In the event of downed power lines, live exposed wires can pose the life-threatening risk of electrocution. |
| *Commercial/ Economy* | Moderate | Coastal flooding can cause substantial property damage to local businesses, lower property value, more and longer breakdowns of supply and distribution chains, increased business interruption, and limit access to commercial buildings with greater frequency. Increasing relief and recovery efforts costs negatively impact local and regional investments in infrastructure and other development. Recurring and increasing periods of tidally influenced flooding or permanent inundation from sea level rise disincentivizes private and public investment in disaster-prone areas, further crippling the local economy. Marina traffic (i.e., arrivals / departures) and fishing may be similarly negatively impacted. |
| *Transportation* | Moderate | Roads and other transportation systems near tidally influenced areas may be expected to flood more frequently and with increased severity. More roads may be impassable and road closures may last longer. Transportation infrastructure adjacent to rivers will need to consider short-term impacts and long-term shifting of shoreline/banks (e.g., bridge abutments). |
| *Water Sanitation/ Supply* | Moderate | Coastal flooding may impact increasing numbers of water / wastewater infrastructure (e.g., waterlines) alongside riverbanks. Undersized storm drainage systems may be increasingly strained during coastal flooding events and are a key concern in many locations. |

# E. More Severe Storms

Large storms are becoming energized by warmer temperatures and more moisture in the atmosphere. These storms are often characterized by high-speed wind gusts and accompanied by other potentially dangerous conditions, such as lightning and heavy rains that can lead to flooding and power outages.[71] Severe wind events can generate prolonged periods of dangerous conditions, placing lives and property at-risk and impacting the local economy.

This section outlines the climate projections, vulnerabilities, and risks and impacts of severe storms.

## *A. Severe Storms*

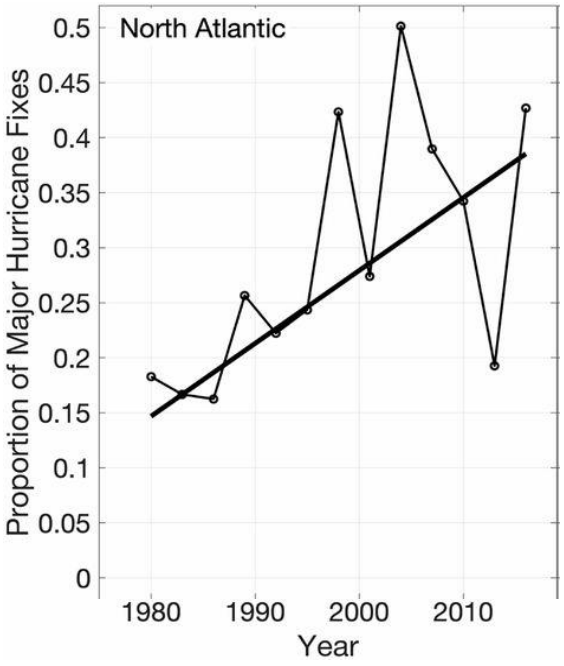
Severe storms, such as hurricanes, tropical storms, and derechos, are often characterized by high-speed wind gusts and often accompanied by other potentially dangerous conditions, such as lightning and heavy rains that can lead to flooding.[72]

### Climate Projection: Severe Storms

In addition to global temperature increase, climate change also causes more moisture in the atmosphere and warmer ocean temperatures. These conditions create the perfect breeding ground for hurricanes and tropical storms, and as a result, Atlantic hurricanes are notably intensifying. As seen in Figure 24, the percent of Atlantic hurricanes categorized as major storms, Category 3 hurricane or greater, has increased by nearly 50% since 1980.[73] The "Proportion of Major Hurricane Fixes" indicates the proportion of tropical cyclones that hit "major" status in a given year (e.g., in 2010, roughly 35% of tropical storms were categorized as major hurricanes).

According to the Prince George's County Hazard Mitigation Plan, severe thunderstorms occur every 5-6 years and hurricanes occur in the County approximately once a decade.

**Figure 24. Percent of North Atlantic Hurricanes as major storms. (Kossin et al. 2020).**




[71] National Oceanic and Atmospheric Administration, U.S. Department of Commerce (2016). Severe Storms. https://www.noaa.gov/explainers/severe-storms

[72] National Oceanic and Atmospheric Administration, U.S. Department of Commerce (2016). Severe Storms. https://www.noaa.gov/explainers/severe-storms

[73] Kossin, et al. (2020). Global increase in major tropical cyclone exceedance probability over the past four decades. https://www.pnas.org/content/117/22/11975

## Past Impacts

While a major hurricane (category 3 or higher) has never directly hit the County,[74] significant storm effects from Atlantic hurricanes are felt virtually every year. Hurricane-force winds and heavy rains can lead to significant storm surge and extensive flooding. For example, in 2003, a category 5 hurricane that made landfall in North Carolina left 5,000 tons of debris in the County, closed 3 roads, left 200,000 County residents without power, and resulted in nearly $4 billion in damages.[75] [76] The power outage also caused 96 million gallons of hazardous untreated sewage from two separate facilities to mix with stormwater to overflow into Western Branch and Broad Creek, prompting the Washington Suburban Sanitary Commission (WSSC) to install generators.[77]

### STRONG WINDS HIGHLIGHT

In the summer of 2020, Prince George's County was hit with heavy rainfall and strong winds from Tropical Storm Isaias. In all, the storm caused more than 1,000 power outages in the County. The storm caused flooding on the Upper Marlboro Pike, with the Interstate 95 corridor feeling the heaviest downpours. Dangerous driving conditions during and after the storm also persisted, with heavy rains making roads slick and high winds disrupting power lines and littering the roadways with debris.

**Figure 25. Property damage resulting from Tropical Storm Isaias. (Prince George's County Fire/EMS Department Twitter).**

[74] Since recordkeeping began in 1851.

[75] NOAA Satellite and Information Service (2003). Event Record Details. https://web.archive.org/web/20110520010055/http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~ShowEvent~499561

[76] Prince George's County Office of Emergency management (2017). Prince George's County & the City of Laurel Hazard Mitigation Plan Update. https://www.princegeorgescountymd.gov/sites/default/files/media-document/dcv29942_2017-pgc-hazard-mitigation-plan-update_adopted.pdf

[77] Wilcock, D. (2003). WSSC to Install Generators After Huge Sewage Overflows in Prince George's. https://web.archive.org/web/20060901122111/http://www.journalism.umd.edu/cns/wire/2003-editions/12-December-editions/031222-Monday/PGPollution_CNS-UMCP.html

## Vulnerability

Severe storms pose significant threats to residents, homes, businesses, and critical infrastructure and facilities. Vital community services can be interrupted as a result of high winds causing a power outage in a critical facility or limiting transportation access.

The following sections elaborate on populations and infrastructure vulnerable to extreme winter in Prince George's County.

### *Vulnerable Populations*

| Exposure |
| --- |
| Due to the expansive nature of major windstorm events, large swaths of the County will feel strong impacts even without being on the direct path of exposure. Individuals and communities along high storm surge areas may be more exposed to subsequent flooding consequences. |
| **Sensitivity** |
| Sensitive populations include residents who may require special assistance to evacuate or relocate, such as those with mobility impairments, physical or cognitive disabilities, or those dependent on caretakers. |
| **Adaptive Capacity** |
| Adaptive capacity heavily influences an individual or community's vulnerability to severe storms. For example, a well-socially connected community is a more resilient community as residents are in closer contact and therefore better able to assist one another evacuate or check in on vulnerable neighbors. Economic conditions play a significant role in an individual's ability to protect and recover from major storms and subsequent flooding. Lower-income residents, such as those residing in EEAs, are less likely to have resources to fortify their homes to withstand strong winds, cover the cost of damage following the event, and/or evacuate prior to the event. Similarly, residents living in substandard housing conditions are at greater risk of damage, such as roof collapse or indoor flooding. |

### *Vulnerable Infrastructure*

Severe wind events can cause significant harm to homes, businesses, and critical infrastructure and facilities. Damage can occur as a result of flooding and/or from flying or fallen debris, like downed trees or power lines. Above-ground utilities and telecommunication lines across the County at risk of being knocked over by strong winds or by fallen trees, which can result in power outages and service disruptions.

## Risks & Impacts

With climate change triggering more frequent and intense wind events, more assets, systems, and populations are expected to be adversely affected. Individuals and communities can be impacted by these storms through loss of life, loss of access, property damage, and through disruptions of vital community services, in addition to indirect impacts like flooding.

The Table below summarizes impacts to key systems and sectors in Prince George's County.

| *Systems/Sectors* | *Impact Magnitude* | *Description* |
|---|---|---|
| *Energy/ Utilities* | High | Severe wind and storm events may impact a greater extent of utility buildings and equipment such as power generation stations, substations, towers, or electrical transformers, and limit access to the facilities for operations and management staff. Power lines, towers, or trees may be felled, and/or equipment damaged, by flying debris, resulting in power outages. Damage to above-ground utilities, which are more prevalent in older neighborhoods and EEA areas, may disproportionally affect vulnerable populations. Undergrounded utilities, while protected from the elements, may give false sense of security if above-ground interconnections are not addressed. |
| *Public Health* | High | The impacts of severe windstorms on public health and well-being will worsen with increasingly dangerous storms. Direct storm-related deaths (e.g., drowning) and indirect health impacts (e.g., disruption of medical care services, mental health stress from evacuation or displacement, mold exposure, etc.).<br>In the event of a power outage, air conditioning or heating systems may stop operating for long periods of time aggravating heat- or cold-related illnesses. Inoperable elevators may prevent those with limited mobility from evacuating, and lack of lighting may result in more accidents or falls.<br>In the event of downed power lines, live exposed wires can pose the life-threatening risk of electrocution. |
| *Commercial/ Economy* | High | The compounding impact of high winds and severe storms can limit the movement of people and goods. Power outages and possible debris from high wind can disrupt business operations, and even force some businesses to permanently shut down. Additionally, these businesses may be the places that provide necessary supplies or resources to those impacted by the storm. |
| *Transportation* | Moderate | Flying debris impact can damage railways, block roads, and contribute to flooding on roads. With an increasing number of severe storms, road blockage, flooding, and disaster relief costs are expected to increase. High winds can impact air travel, delaying flight schedules impacting those within and outside of the region. |
| *Water Sanitation/ Supply* | Moderate | Hurricanes and other strong storms can have disastrous impacts on water sanitation and supply, even when the County is not on the storm's direct path. For example, Hurricane Sandy in 2012 dropped more than 80 million gallons of sewage into Maryland and resulted in combined sewage overflows.[78] When coupled with extreme precipitation, an increasing number of water / wastewater buildings and equipment (treatment plants, pumping stations) may be impacted. See Inland Flooding & Extreme Precipitation Section. |

[78] Climate Central (2013). Sewage Overflows from Hurricane Sandy. https://www.climatecentral.org/pdfs/Sewage.pdf

## III. Next Steps

Climate risk and vulnerability is a dynamic field with new data being collected, reports being released, and a variety of tools and data sets being launch every year. This CRVA is the first for Prince George's County, and represents an initial analysis of the climate risks and vulnerabilities at a higher level. Future iterations should develop local downscaled climate projections to assess the County's critical infrastructure against. Collaboration with other Departments and partners (e.g., Pepco, WSSC, etc.) will be needed to obtain necessary the data to conduct a more thorough impact modelling and analysis of the critical facilities and infrastructure vulnerable to the various hazards. Future iterations may also focus on a small number of neighborhoods to assess vulnerability and risk at a more localized scale.

# Appendix A. Social Vulnerability in Prince George's County

Climate change does not impact all residents and communities equally. Studies have demonstrated that racial and ethnic minorities and lower income households are disproportionately at risk and vulnerable to the impacts of climate change.[79] These groups tend to be more sensitive (e.g., as a result of historical and structural patterns of inequity, marginalization, and discrimination) and/or have lower adaptive capacity (e.g., lack the disposable income to take measures to fortify home against climate change, such as flood retrofitting or owning a generator). As a result, these populations are more socially vulnerable and less able to anticipate, withstand, cope with, and recover from climate hazards.

The Center for Disease Control and Prevention (CDC) Agency for Toxic Substances and Disease Registry assesses social vulnerability using a Social Vulnerability Index based on four themes, outlined in Table 8.[80] The CDC defines social vulnerability as *"a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters, such as tornadoes or disease outbreaks, to human-caused threats, such as toxic chemical spills."* Prince George's social vulnerability profile is displayed in Figure 26.

**Table 8. Variables included in CDC's Social Vulnerability Index.**

| Social Vulnerability Theme | Variables Included in Analysis |
|---|---|
| **Socioeconomic Status** | Poverty, Unemployed, Per Capita Income, No High School Diploma. |
| **Household Composition/Disability** | Aged 65 and Over, Aged 17 and Younger, Single-parent Household, Aged 5 and over with a Disability |
| **Race/Ethnicity/Language** | Racial Minority, English Language Ability |
| **Housing Type/Transportation** | Multi-unit, Mobile Homes, Crowding, No Vehicle, Group Quarters. |

To identify neighborhoods with high social vulnerability, the National Capital Region Transportation Planning Board developed a vulnerability index that combines significant concentrations of racial minorities (i.e., African Americans, Asians, and Hispanic/Latinos) and low income (defined as household income less than one-and-a-half times the federal poverty threshold) populations. The results help to identify Equity Emphasis Areas (EEAs).[81] Prince George's County has 118 EEAs mostly concentrated near

[79] EPA (2021). Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts. https://www.epa.gov/cira/social-vulnerability-report

[80] CDC Agency for Toxic Substances and Disease Registry (2020). CDC Social Vulnerability Index 2018: Prince George's County, Maryland. https://svi.cdc.gov/Documents/CountyMaps/2018/Maryland/Maryland2018_Prince%20George's.pdf

[81] National Capital Region Transportation Planning Board (2017). Methodology for Equity Emphasis Areas. http://www1.mwcog.org/clrp/performance/EJ/resources/methodology.pdf

the D.C. border, as seen in Figure 27. In one exercise of the CRVA Workshop, stakeholders were asked to identify vulnerable populations in Prince George's County. The results are listed below:
Socially vulnerable populations in Prince George's County, as identified by the Adaptation Working Group:

**Demographics:**

- Older adults
- Young children
- Socially isolated individuals
- Pregnant women/parents of young children
- Immigrants / Undocumented Immigrants
- Refugees / Asylum-seekers
- Returning citizens
- Non-English speakers (e.g., Mayan speakers in Langley park)

**Socio-economic:**

- Residents in Equity Emphasis Areas (EEAs)
- Income-limited households
- Single-headed households
- Renters
- Individuals experiencing homelessness or living in informal settlements

**Health:**

- Individuals with disabilities (limited mobility, hearing impaired, visually impaired, etc.)
- Individuals with chronic illnesses
- Individuals with mental health conditions
- Individuals without medical insurance

**Occupational:**

- Healthcare workers
- Service and manual labor workers
- Civil works employees / frontline workers

**Adaptive capacity:**

- Individuals without a vehicle
- Individuals without a computer, mobile phone, and/or working internet
- Individuals without home or renter's insurance

**Other:**

- Populations at the intersections of hazards
- Civil works employees / frontline workers
- Residents in rural areas
- Commuters

**Figure 26. CDC Social Vulnerability Index, summarized by (in clockwise order) socioeconomic status, household composition/disability, race/ethnicity/language, and housing type/transportation.**

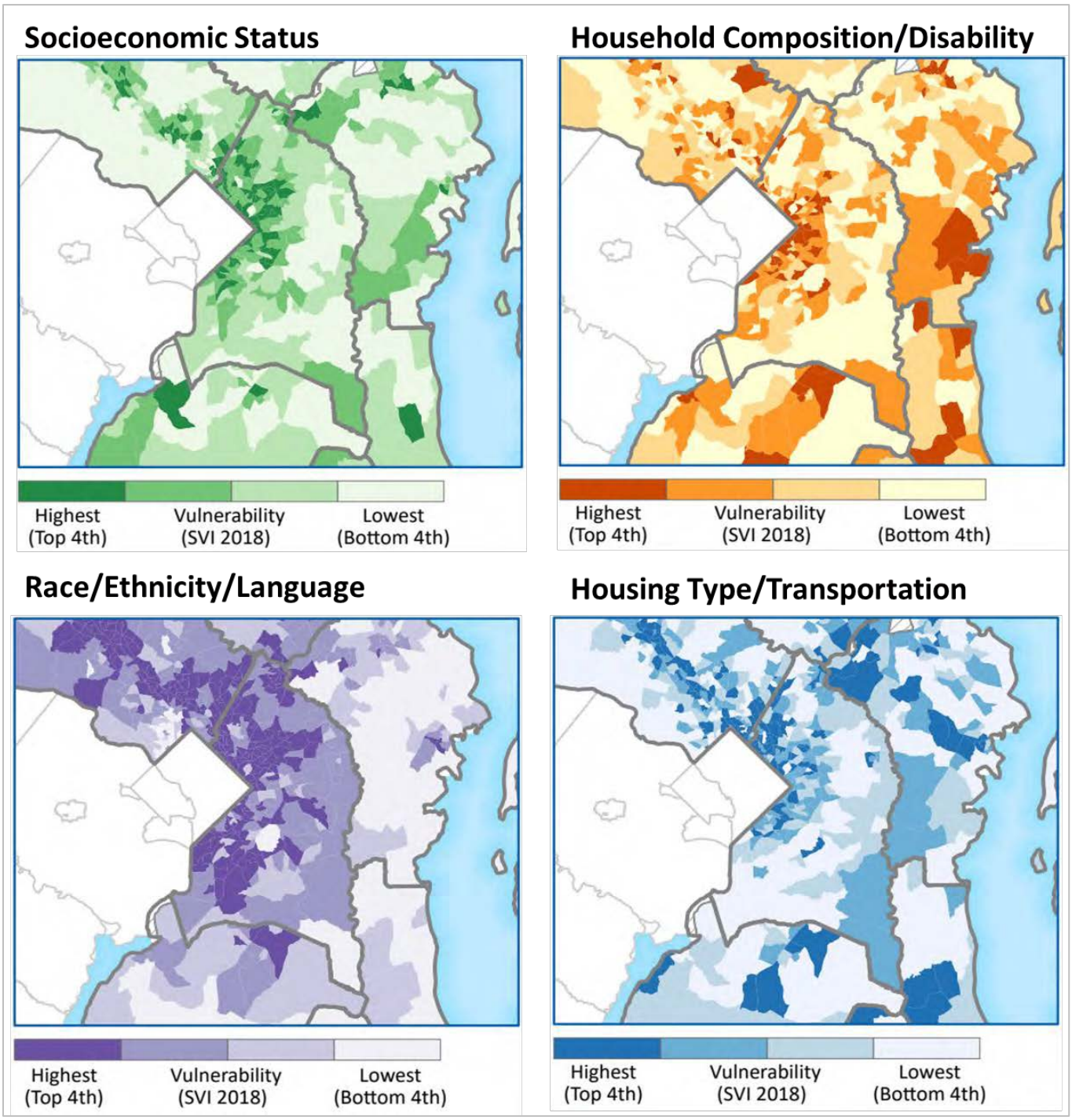
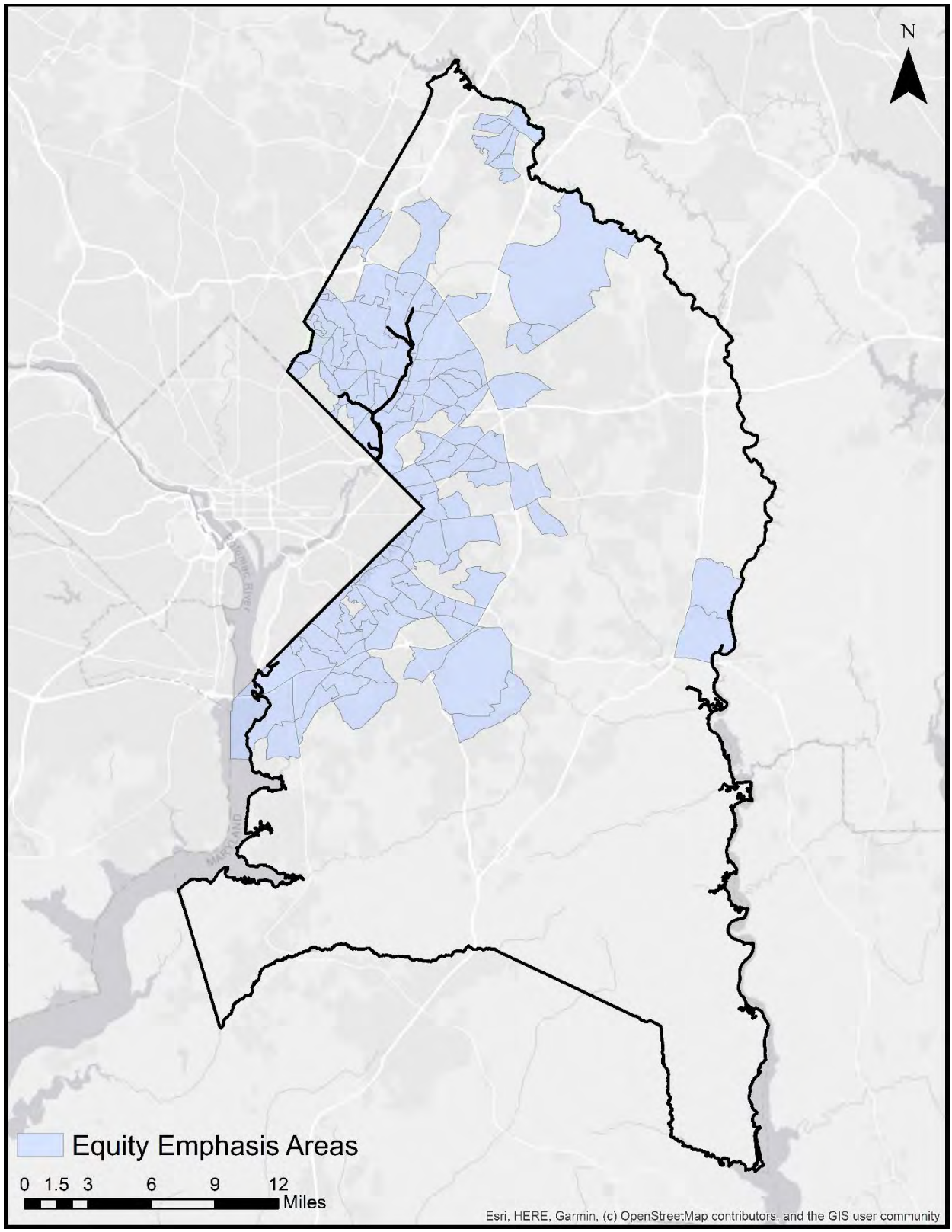


**Figure 27. Equity Emphasis Areas in Prince George's County.**



# Appendix B. CRVA Workshop Summary

Prince George's County held a 2-part Climate Resiliency & Vulnerability Workshop in April 2021 to convene key stakeholders that own, manage, or operate infrastructure and public services. This included representatives from Washington Gas, Pepco, Joint Base Andrews, US Army Corps of Engineers, MWCOG, Water and Wastewater Services, Public Health, Department of Environment, and more. The goals of the workshop included to:

- Inform the draft Climate Risk and Vulnerability Assessment report
- Present and ground-truth preliminary CRVA report findings
- Add new insight from stakeholders who own and operate key vulnerable infrastructure assets and systems and interact with at-risk populations.
- Develop a common understanding of climate vulnerabilities and risks.
- Identify both vulnerabilities and strengths of assets, systems, and populations within the County.
- Transition from climate vulnerabilities to identifying strengths and opportunities for increasing resilience and adaptive capacity through Actions.

The following summarizes specific assets, systems, and populations that were discussed and captures participant insights on climate vulnerabilities and potential actions to reduce risk.

| Asset/System/Population | Summary of Concerns and Potential Actions |
|---|---|
| Residential buildings in floodplain | Increasing risk for homes in floodplains, homes in urban areas with high impervious surface. Need education and outreach. Promote NFIP participation, CRS, and discounts. Consider needs of renters. Implementation to include sump pumps in basement, battery backup; keep drains/gutters clean; elevating mechanical/electrical equipment. How can County focus on certain neighborhoods or make funding available? How to disincentive development in repeat flood areas? |
| Commercial buildings in floodplain | Commercial buildings provide goods/services that people need in disasters; if buildings are flooded the community isn't served, can't get supplies, employees unable to work. Disruptions to these buildings result in loss of economic prosperity. If repeated flooding, will these owners leave/move to higher ground? Potential loss of tax revenue if businesses close or move. Flooded building also causes risk to the energy system. Flooding can cause indoor air quality issues. Consider grant opportunities for flood proofing, enable them to continue to be used safely. Education to help people understand insurance options. Educate owners of flood prone buildings. Offer green energy loans to commercial entities to microgrids, EVs, community solar. Expand CPACE to include resilience. |

| | |
|---|---|
| Parks and other open public space (ex. Waterfront Pk) | Parks and open space store flood waters and trees create shade & reduce heat island affect. There are opportunities to create more green space in vacant lots. Parks could provide a place for cellphone charging w/ solar and be utilized as staging areas during emergency response. Look at opportunities to create additional green space on vacant county properties and opportunities for new parks. Look at companies that sell a "multi-use station" with seating and solar charging. Increase shading at parks. Consider establishing "tree banks" in county (forested area that's preserved). Consider opportunities to host resilience hubs. |
| Transportation and utilities system | With electrification of transportation need to consider grid resilience. Overhead utilities more vulnerable to climate stressors, tends to be near vulnerable populations (Inner beltway, Anacostia watershed area - most utilities above ground). Even in areas with more underground utilities what's feeding them is above ground. |
| School system | The school system provides location for shelters during disasters and is a hub of community education related to climate action. It is vulnerable as a high concentration of young people in a location. Need further assessments. Some schools susceptible to flooding; many older buildings; HVAC systems likely not equipped for extreme heat (HVAC systems being renovated due to Covid- potential synergy to explore). Do schools have backup energy systems? There are opportunities for solar on schools and schools are doing a comprehensive energy program. |
| Public Safety Facility (new building housing fire, police & HHS) | Building is home to critical services; emergency vehicles need to be able to get in/out |
| Libraries | Similar to schools in many ways (hub for community and education, older buildings); reliability of service during storms & high wind events- libraries provide a central point for people to access the internet; great opportunity for resiliency hubs |
| Senior Activity Center in floodplain | Vulnerability/priority may depend on the climate hazard and main function of the center. Should assess HVAC capability, assess natural/env protections (trees, GI), impervious surfaces, energy resilience, renewable energy potential. Need funds to support building retrofit, rebate program. Short term action (<3 years) - developing list of where property owners can access resources for building improvements/retrofits, federal funding, etc. Mid-term action (<3 years) - assess HVAC system, assess building standards/zoning ordinances. Create resiliency checklist for building owners, plan for mitigating climate impacts tied to climate projections (state vs federal projections). |
| Historic Sites in floodplain (ex. Adelphi Mill) | Most vulnerable because built prior to floodplain regs. There are stringent rules around modification. Must recognize cultural value to the community and some provide rental space for community events. |
| Duckett Dam | Did a vulnerability assessment last year; Considered 2065 100y flood and found dam is ok but pumping station needs hardening/upgrade. Disruption to the pumping station would create lack of potable water. Do we have adequate backup energy (looking at potential microgrid)? |

| | |
|---|---|
| High hazard dams | Is there a need to revisit approved dam breach analysis to account for precipitation increase? Will risks to downstream communities increase due to this increase? |
| Levees - Flood Control Structures | Levees provide protect 2,000+ buildings from riverine flooding but these structures also cause interior flooding. Will areas behind levees be inundated more frequently due to climate change? |
| Wastewater Treatment System | Wastewater Treatment facilities can be impacted by heat, flooding, and drought. A climate resiliency study was completed for 3 wastewater treatment facilities. There is a need for back-up power at 2 WWTPs. |
| Water Treatment Facilities (drinking water) | Need to ensure community has potable water during droughts. There have been assessments of drought reliability but should ensure these include current climate projections. |
| Utilities (above ground) | Communities are at risk for frequent and extended power outages and communication interruptions due to severe storm events; older communities are particularly at risk |
| Problematic soils conditions | These soils have a high shrink/swell (movement) and deformation/slip (failure) properties making them unstable for buildings, and other structures, as they may crack and compromise foundations leading to structural instability |
| Storm drains | Lack of storm drain capacity to capture and convey stormwater runoff. Storm drain sized 50 years ago, cannot handle today's volume, senior citizen centers and others can inundate vulnerable facilities/areas (upgrade these structures first). Reevaluate standards (short term), prioritize implementation near vulnerable facilities and highly impervious. Use smart tech to monitor storm drains (UMD). Need education. Incorporate NOAA Atlas updates into design criteria. Regularly evaluating/updating climate projections (e.g., 3-5 years), conduct infrastructure/ needs assessment, evaluate outcomes. Retrofits are extremely costly and difficult to reach in <8 years. Determine community expectations and priorities: what level of resiliency is needed. Need additional technical support and guidance. |
| Green infrastructure | Green infrastructure (GI) is an important community strength that both supports heat mitigation and stormwater retention. The Green Infrastructure Plan for 2035 contains actions to enhance resiliency through GI. Efforts are underway to study precipitation estimates and update Atlas 14. Need to evaluate statutes and develop comprehensive approach to manage quantity of water. Need integrated stormwater management in urban areas. Support urban forestry programs to maximize canopy in vulnerable communities. Win-win strategy to employ residents and reduce urban heat. Green Area Ratio in DC is good model for GI in urban areas. Should preserve existing tree canopy and expand GI in areas with high development pressure. Challenge of trees and overhead utility lines and a need to find balance. Need to consider equity concerns. |
| Grocery stores | Grocery stores are an important aspect of resiliency. If given a shelter in place order, grocery stores must remain open to ensure community is able to shelter in place. |

| | |
|---|---|
| Resiliency hubs | Resiliency hubs are community strengths; must be well equipped with back-up power generation. |
| Vulnerable populations | Know that some members of the community are more at risk of social & economic challenges; hit harder by disaster; may have older housing; worse HVAC; more susceptible to extreme heat events. There is a need for social cohesion network (e.g., neighbors taking care of neighbors, like NYC's Be-A-Buddy system). Examine the human capital that can be mobilized during emergencies and traditional modes of outreach. Ensure health as a key criterion is baked into other actions.<br>Data monitoring & evaluation should be incorporated to measure impact of climate change in specific vulnerable communities. Likely a proposed action of CAP: how to measure vulnerable populations. Invest in risk communication and communication during emergencies. Need to involve civic groups to activate communication channels. Continue work to make materials available in more languages; reach with workshops; get their insights about what is needed. Across all categories assess condition of evacuation plans, plans for outages, understand special considerations. Review emergency response plans with equity lens. |
| Immigrants, non-English speakers, refugees, or undocumented immigrants | This population has many compounding variable (low income, underlying health conditions, communication barriers). Lack of transportation, lack of trust in government. Won't get information they need in emergency. Will be more impacted by disaster. Population has housing challenges. Many live in urbanized areas of county. May be predisposed to climate risks including heat and flooding. Access whether current cooling centers those are sufficient. Consider how to improve green infrastructure and increase shading. Expand opportunities for renewable energy and address inadequate HVAC in older buildings. Prioritize stormwater improvements in urbanized communities. Ports Town areas home to many immigrant families and to levee systems. Sept 2020 have opportunities to upgrade pumping stations in levee systems to have more capacity and convey flood waters. Standing water=communicable disease. Consider education related to water quality post-flood. |

# Appendix C. Summary of Vulnerable Assets

The Table below lists specific vulnerable assets identified and discussed during the April CRVA workshop. Assets include a range of public service buildings that are located in the floodplain, Equity Emphasis Areas, and/or a high-heat census tract.[82] These assets are mapped in Figure 28.

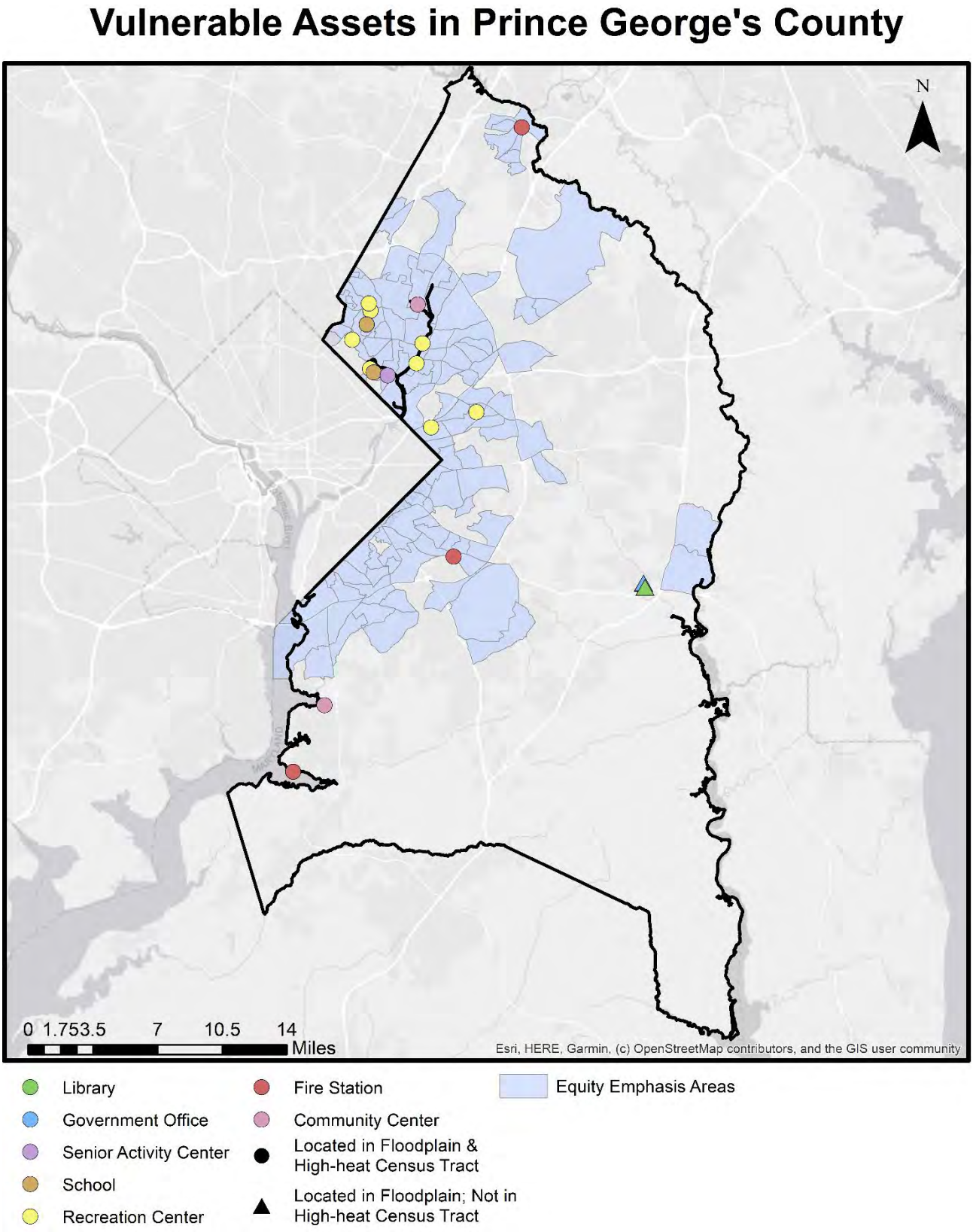
**Table 9. Select Vulnerable Assets in Prince George's County**

| Type | Name | Location | In FEMA floodplain? | In Equity Emphasis Area? | In high-heat census tract? |
|---|---|---|---|---|---|
| Fire Station | Morningside | Morningside | Y | Y | Y |
| Fire Station | Laurel Rescue Squad | Laurel | Y | Y | Y |
| Fire Station | Marine Rescue 857 | Fort Washington | Y | N | Y |
| Library | Circuit Court Law Library | Upper Marlborough | Y | N | N |
| Senior Activity Center | Gwendolyn Britt Senior Activity Center | Brentwood | Y | Y | Y |
| Community Center | Harmony Hall Community Center | Fort Washington | Y | N | Y |
| Community Center | College Park Community Center | College Park | Y | Y | Y |
| Community Center | North Brentwood Community Center | Brentwood | Y | Y | Y |
| School | Thomas S. Stone Elementary School | Mount Rainier | Y | N | Y |
| School | Lewisdale Elementary School | Hyattsville | Y | Y | Y |
| Recreation Center | Jesse J. Warr, Jr. Neighborhood Recreation Center | Fairmont Heights | Y | Y | Y |
| Recreation Center | Kentland Neighborhood Recreation Center | Kentland | Y | Y | Y |

[82] Based on whether census tract had greater than 30 average annual heat days (i.e., days above 90 degrees Fahrenheit), 2006 – 2016. Data from CDC National Environmental Public Health Tracking Network.

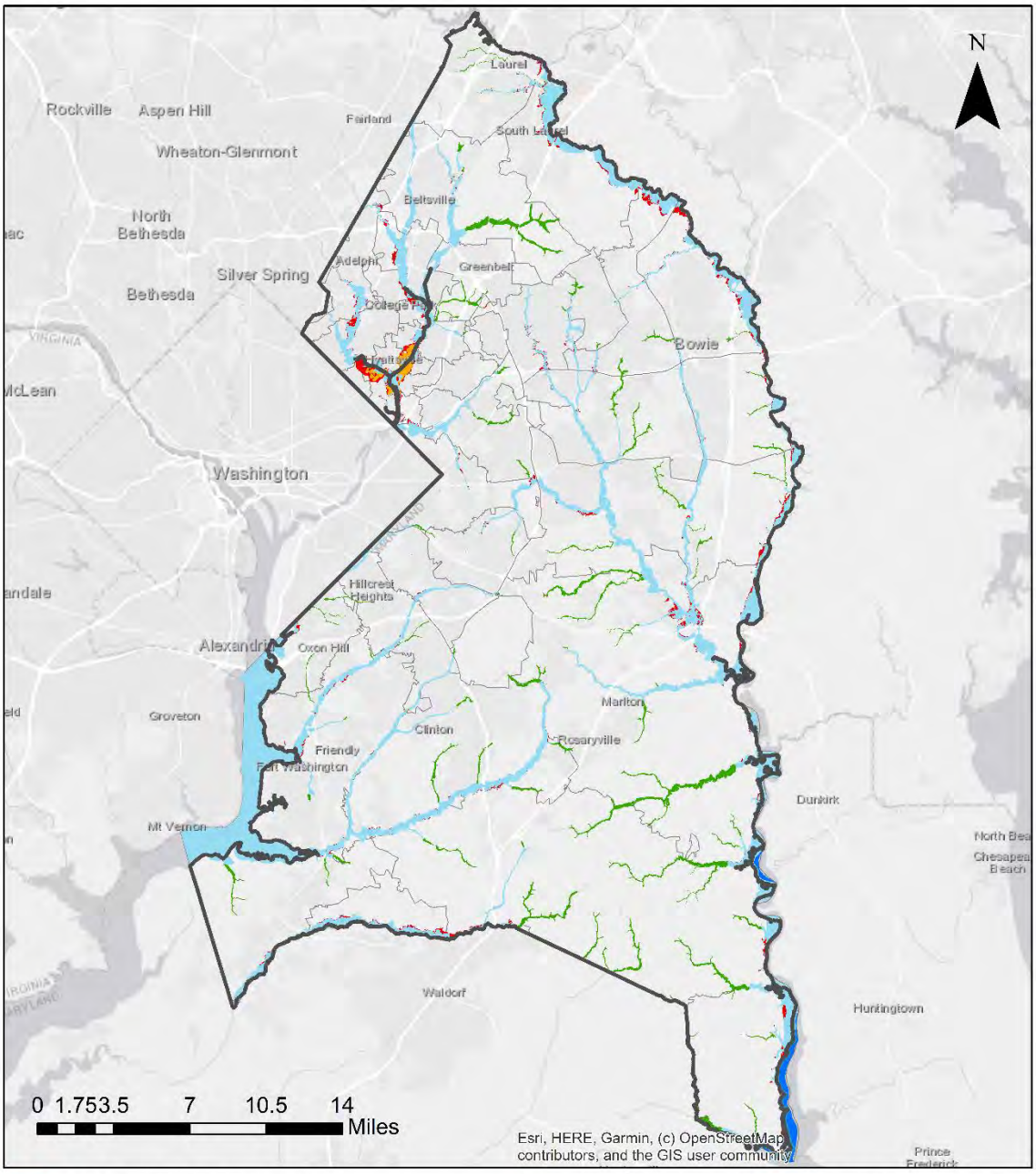
| | | | | | |
|---|---|---|---|---|---|
| Recreation Center | Mt. Rainier Neighborhood Recreation Center | Mt. Rainier | Y | Y | Y |
| Recreation Center | Edmonston Neighborhood Recreation Center | Edmonston | Y | Y | Y |
| Recreation Center | Riverdale Community Recreation Center | Riverdale | Y | Y | Y |
| Recreation Center | Green Meadows Community Recreation Center | Hyattsville | Y | Y | Y |
| Recreation Center | Lane Manor Community Recreation Center | Adelphi | Y | Y | Y |
| Recreation Center | Adelphi Manor Community Recreation Center | Adelphi | Y | Y | Y |
| Government Office | Peoples Zoning Council | Upper Marlborough | Y | N | N |
| Government Office | Prince George's County Credit Union | Upper Marlborough | Y | N | N |
| Government Office | Human Relations Commission | Upper Marlborough | Y | N | N |

**Figure 28. Select Vulnerable Assets in Prince George's County**



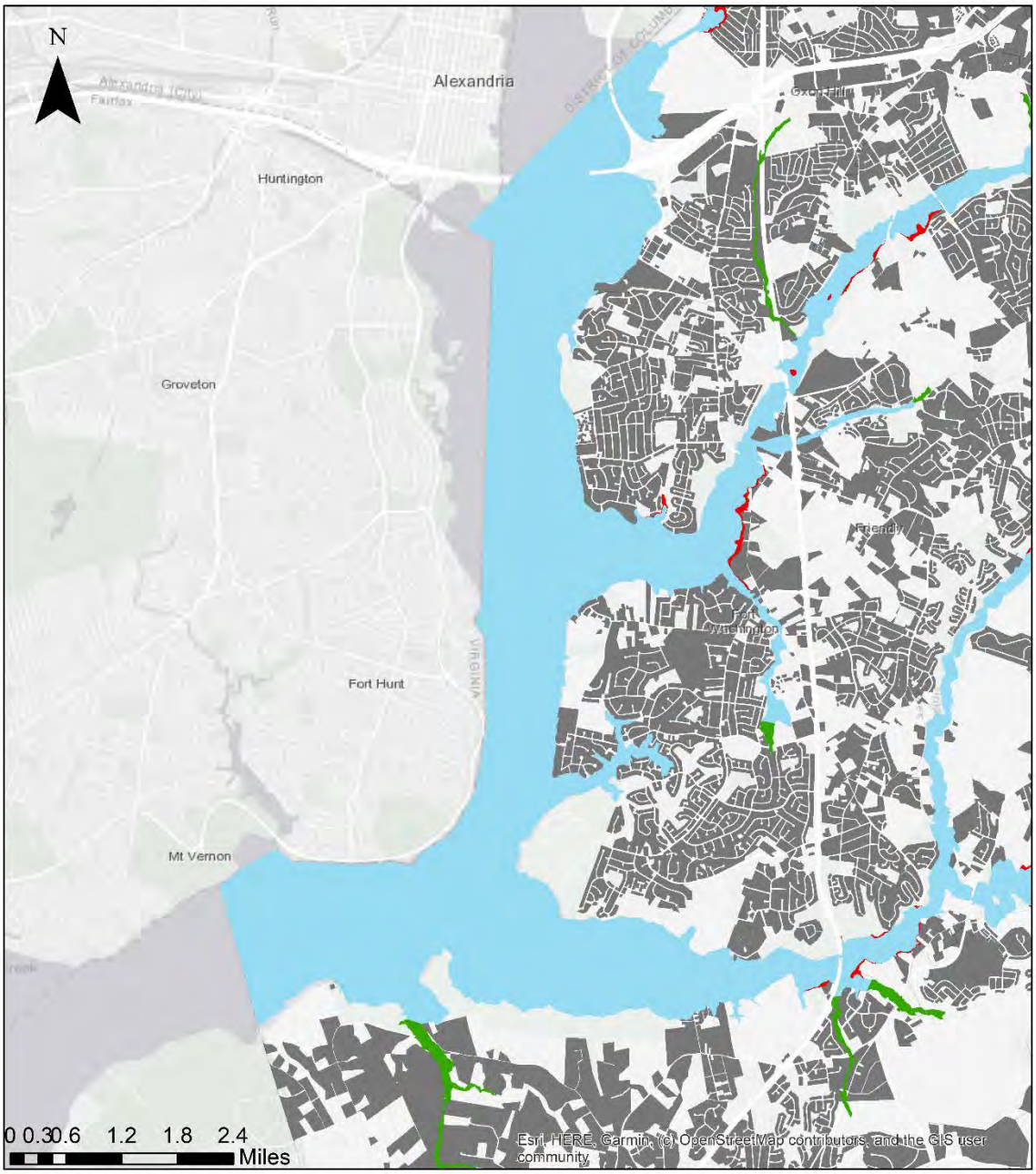
## Appendix D. Maps

# FEMA Floodplains in Prince George's County



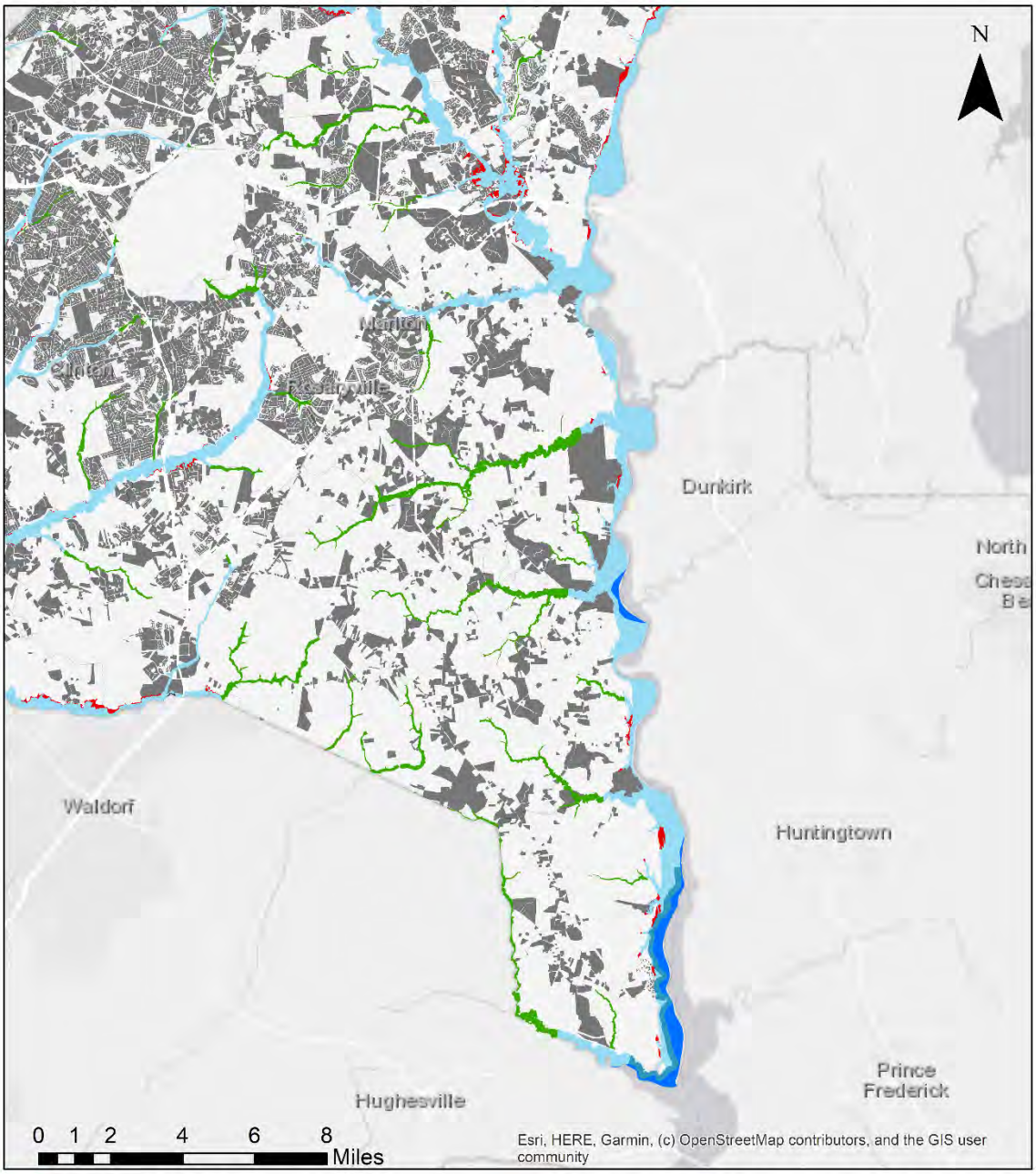

- X - 0.2% FLOOD HAZARD
- A - 1% APPROXIMATE FLOOD HAZARD
- AE - 1% DETAILED FLOOD HAZARD
- AH - 1% SHALLOW DETAILED (PONDING)
- AO - 1% SHALLOW DETAILED (SLOPING TERRAIN)
- OPEN WATER
- VE - 1% COASTAL DETAILED
- X - PROTECTED BY LEVEE

# FEMA Floodplain along the Potomac River



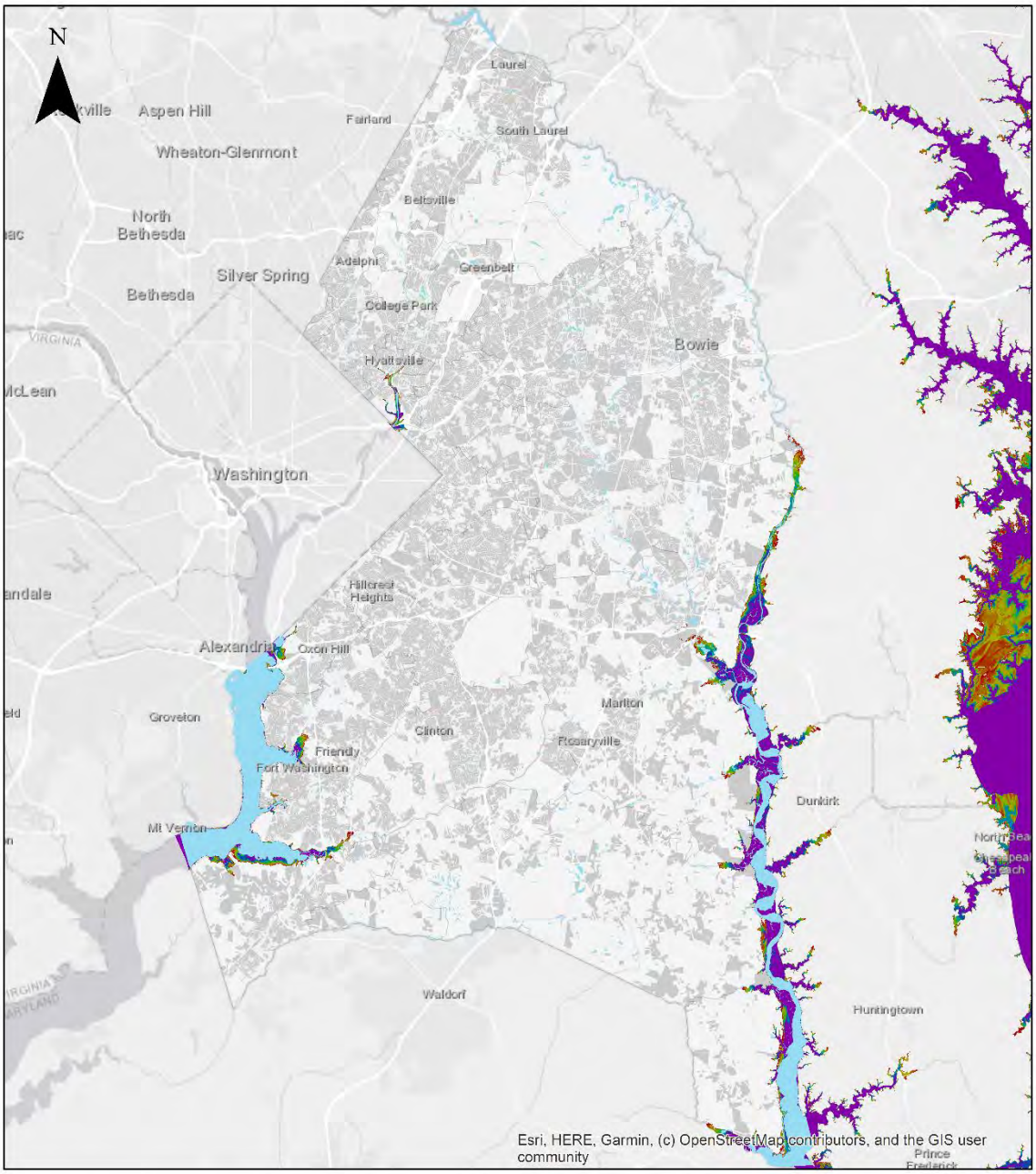

- X - 0.2% FLOOD HAZARD
- A - 1% APPROXIMATE FLOOD HAZARD
- AE - 1% DETAILED FLOOD HAZARD
- AH - 1% SHALLOW DETAILED (PONDING)
- AO - 1% SHALLOW DETAILED (SLOPING TERRAIN)
- OPEN WATER
- VE - 1% COASTAL DETAILED
- X - PROTECTED BY LEVEE

# FEMA Floodplain along the Patuxent River

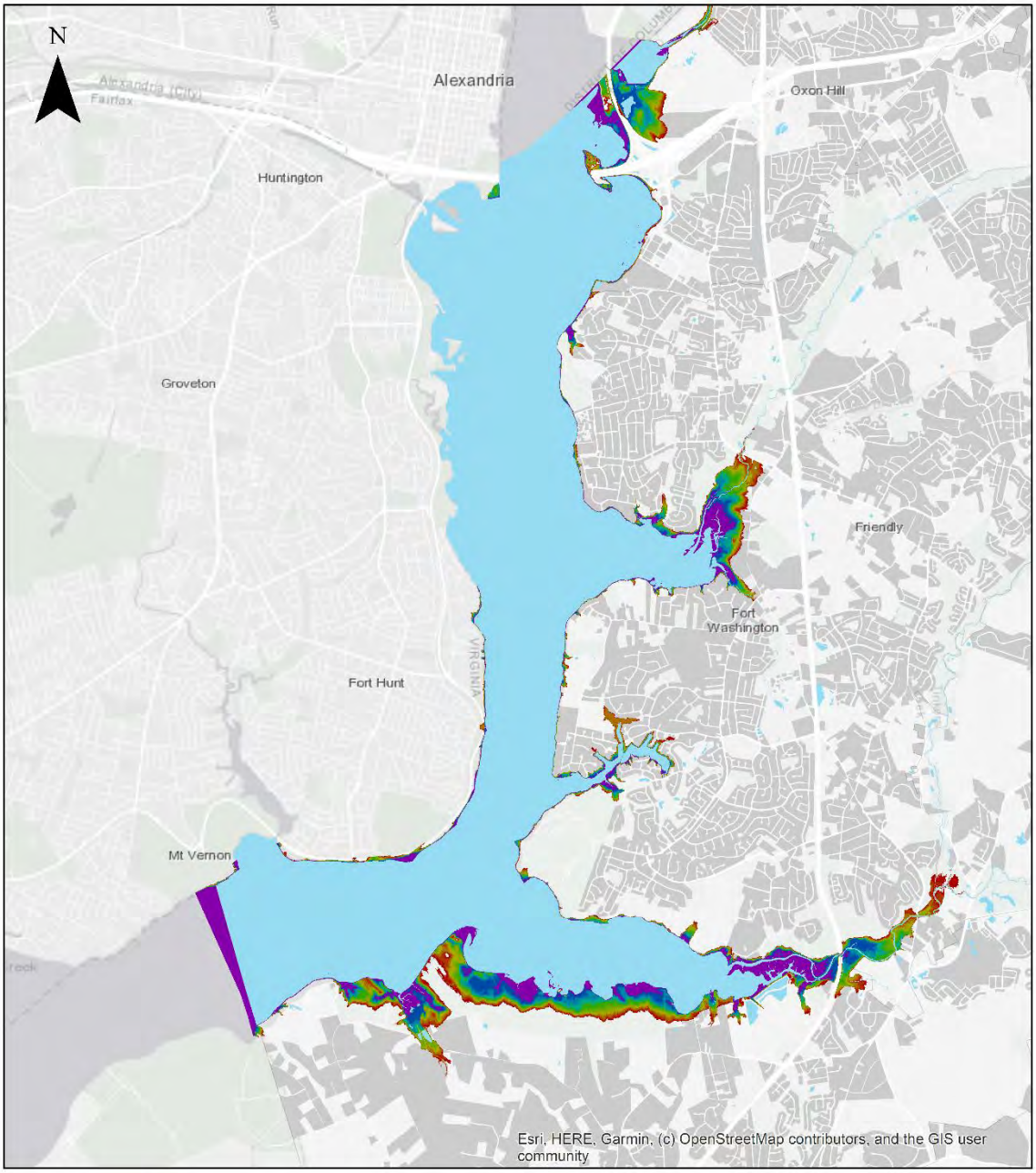



- X - 0.2% FLOOD HAZARD
- A - 1% APPROXIMATE FLOOD HAZARD
- AE - 1% DETAILED FLOOD HAZARD
- AH - 1% SHALLOW DETAILED (PONDING)
- AO - 1% SHALLOW DETAILED (SLOPING TERRAIN)
- OPEN WATER
- VE - 1% COASTAL DETAILED
- X - PROTECTED BY LEVEE

# Sea Level Rise in the Prince George's County



# Sea Level Rise in the Potomac River




**Sea Level Rise (feet)**

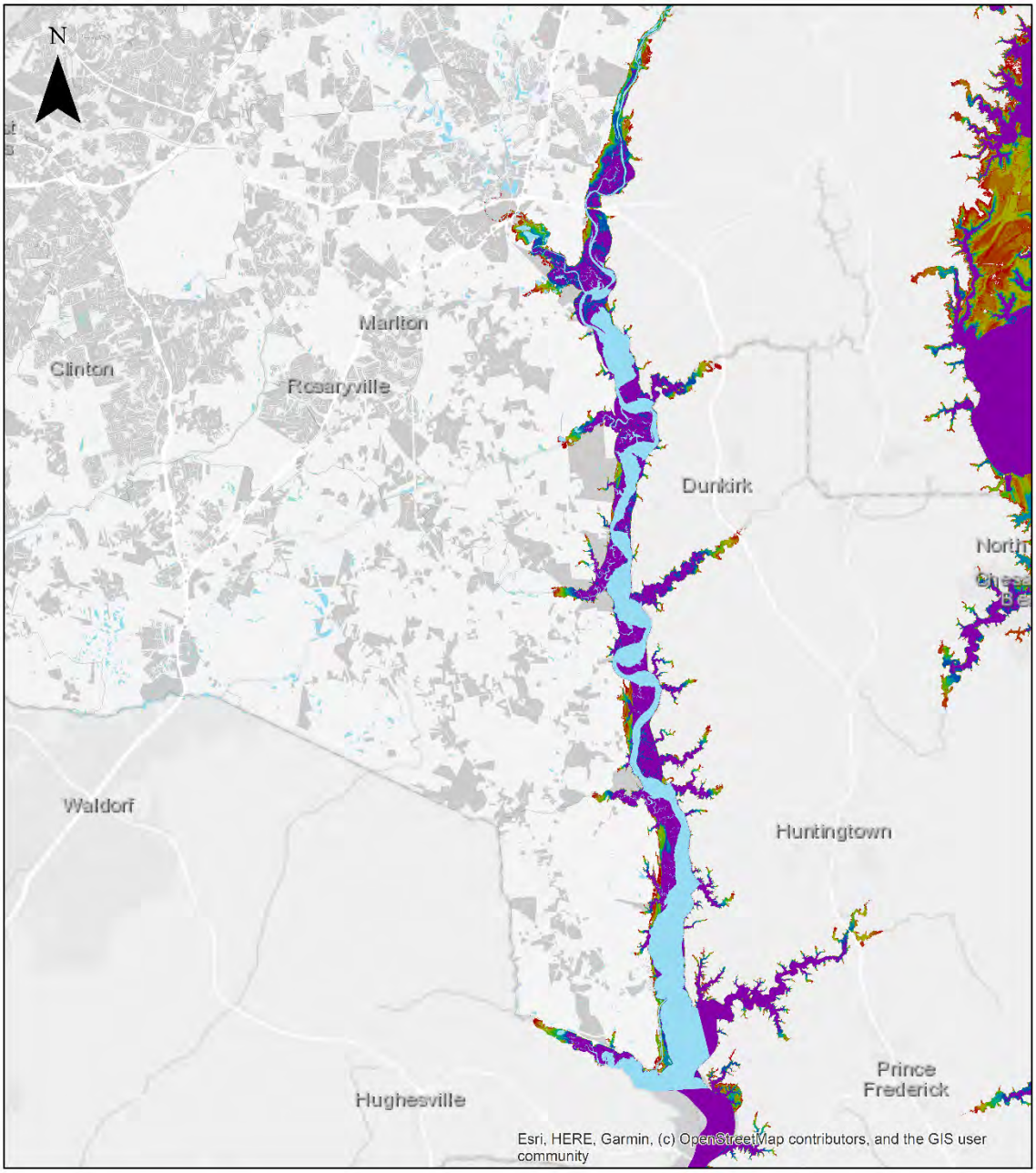
1 10

0 0.45 0.9 1.8 2.7 3.6 Miles

Water Bodies

Building Footprints

# Sea Level Rise in the Patuxent River




**Sea Level Rise (feet)**

1 — 10

Patuxent River

0 1 2 4 6 8 Miles