MONTGOMERY COUNTY CLIMATE ACTION PLAN

Building a Healthy, Equitable, Resilient Community

APPENDICES

PUBLIC DRAFT

This space is reserved for local art work from winners of the County's art contest.

Calling all artists and climate justice activists!

Montgomery County is hosting a competition for artwork to be featured in the County's climate action plan. What photos, drawings, poems, digital art, and memes (yes, we meant it, memes) invoke the need to protect your community from climate change? Help us to harness your creativity to sound the alarm about the climate emergency. Art is an incredibly important tool that will engage all County residents from a variety of backgrounds. Through this contest, we hope to reach those who might not have previously been engaged in the climate planning process, especially those from marginalized backgrounds who will be disproportionately impacted by changes in climate. The deadline for the contest in Sunday, January 31, 2021. For more information, please visit ***the art contest website***.

Appendix A: Full List of CAP Actions

How to Read the Full List of CAP Actions Table

GHG Mitigation

Estimated level of emissions reduction. These reductions are projected out until 2035.

- High: >1,000,000 metric tons of carbon dioxide equivalent (MT CO_2e)
- Medium: 500,000-1,000,000 MT CO_2e
- Low: <500,000 MT CO_2e
- Level To Be Determined (TBD): Carbon Sequestration Actions – these actions sequester carbon and thus reduce greenhouse gas (GHG) emissions, however, the level of emissions; reduction cannot be estimated without further study
- N/A: Climate Adaptation Action without GHG emissions reduction OR Enabling Action* (action that does not have a direct emissions reduction but is necessary to support actions with direct emissions reduction)

Climate Risk Reduction

Climate hazard the action addresses:

- Extreme Heat
- Extreme Precipitation
- High Winds
- Drought
- N/A: GHG Mitigation Action without climate risk reduction OR Enabling Action* (action that does not have direct climate risk reduction but is necessary to support actions with direct climate risk reduction)

*Note: If an action is an Enabling Action, "N/A" will appear under GHG Reduction, Climate Risk Reduction, and all co-benefits.

Co-Benefits

Level of estimated impact the action would have on each of the four co-benefits—Racial Equity & Social Justice, Public Health, Environmental Stewardship, and Economic Prosperity—in Montgomery County:

- - = Very Negative

- = Somewhat Negative

Neutral = Neutral

+ = Somewhat Positive

++ = Very Positive

Authority

Who has the authority to implement this action. For the purposes of this section, "County" is defined as County Executive branch departments and County Council. Independent public agencies, such as MCPS and M-NCPPC, are defined as "other public entities" for the purposes of this section.

- County – County can implement the action under existing policy
- County with Change – County can implement the action but may require policy amendment or new policy
- Outside County – action implementation requires County collaboration with other public or private entities or is outside County authority

County Investment

Initial upfront costs beyond any currently secured or identified funding:

- $: Low Initial Cost (Public: <$100k)
- $$: Some Initial Cost (Public: $100k-$1M)
- $$$: Large Initial Cost (Public: >$1M)

Private Investment

Initial upfront costs beyond any currently secured or identified funding:

- $: Low Initial Cost (Private: <$10M)
- $$: Some Initial Cost (Private: $10-$100M)
- $$$: Large Initial Cost (Private: >$100M)

Lead

Lead County department or independent public agency that would be involved in action development and implementation.

Contributor

Contributor County department, independent public agency, or other entity that would be involved in action development and implementation.

Subsector

- E Clean Energy
- B Buildings
- T Transportation
- S Carbon Sequestration
- A Climate Adaptation
- G Climate Governance
- P Public Engagement, Partnerships, and Education

Subsector	Action	GHG Reduction*	Climate Risk Reduction	Racial Equity & Social Justice	Public Health	Environmental Stewardship	Economic Prosperity	Authority	County Investment	Private Investment	Lead	Contributor
E	E-1: Community Choice Energy Program	High	N/A	Neutral	Neutral	Neutral	+	Outside County	$$	$	CEX, DEP	OIR
E	E-2: Private Building Solar Photovoltaic Code Requirements	Medium	N/A	-	Neutral	Neutral	+	County with Change	$$	$$$	DPS	DEP
E	E-3: Promote Private Solar Photovoltaic Systems	Medium	N/A	++	Neutral	Neutral	++	Outside County	$$$	$	DEP	DPS, MCGB, DOF
E	E-4: Public Facility Solar Photovoltaic Installations and Groundwork	Low	N/A	Neutral	Neutral	Neutral	+	County	$$$	$	DGS, MCPS, M-NCPPC	MCDOT, DPS, Office of Agriculture, Revenue Authority, DEP
E	E-5: Advocate for a 100% Renewable Portfolio Standard by 2030	N/A	N/A	Neutral	Neutral	Neutral	Neutral	County	$	$	OIR, CEX	DEP
B	B-1: Electrification Code Requirements for Existing Commercial and Public Buildings	High	N/A	- -	+	Neutral	+	Outside County	$$	$$$	DPS, DGS, DHCA, MCPS	DGS, DEP, DPS
B	B-2: Electrification Code Requirements for Existing Residential Buildings	High	N/A	- -	+	Neutral	+	Outside County	$$	$$$	DPS	DEP
B	B-3: Energy Performance Standard for Existing Commercial & Multifamily Buildings	High	Drought	-	+	Neutral	+	Outside County	$$$	$$$	DEP	DGS, DPS, DHCA, DOF, MCGB

Subsector	Action	GHG Reduction*	Climate Risk Reduction	Racial Equity & Social Justice	Public Health	Environmental Stewardship	Economic Prosperity	Authority	County Investment	Private Investment	Lead	Contributor
B	B-4: Electrification Incentives for Existing Buildings	High	N/A	Neutral	+	Neutral	++	Outside County	$$$	$$	DEP, DHCA	MCGB, DOF
B	B-5: All-Electric Building Code for New Construction	High	Drought	Neutral	+	Neutral	Neutral	Outside County	$$	$$	DPS	DEP, DGS
B	B-6: Ban Natural Gas in New Construction	High	N/A	-	+	Neutral	Neutral	Outside County	$$	$$	DPS	DEP, DGS
B	B-7: Net Zero Energy Building Code for New Construction	High	N/A	Neutral	+	Neutral	+	County with Change	$$$	$$	DPS, DGS, MCPS, DHCA	DEP, M-NCPPC
T	T-1: Expand Public Transit	Medium	N/A	++	++	Neutral	++	Outside County	$$$	$	MCDOT, WMATA, MDOT	MTA, M-NCPPC
T	T-2: Expand Active Transportation and Shared Micromobility Network	Medium	N/A	++	++	Neutral	++	County	$$$	$	MCDOT	MDOT, M-NCPPC
T	T-3: Private Vehicle Electrification Incentives and Disincentives	Medium	N/A	-	++	Neutral	++	Outside County	$$$	$$$	DOT, MCDOT, DEP	MCGB, DOF
T	T-4: Congestion Pricing and Limiting Cars in Urban Areas	Medium	N/A	-	++	Neutral	Neutral	Outside County	$$$	$	MCDOT, MDOT	Regional service centers, M-NCPPC
T	T-5: Electrify Public Buses and School Buses	Medium	N/A	++	+	Neutral	+	County	$$$	$	DGS, MCDOT, MCPS	OMB
T	T-6: Electrify County and Public Agencies Fleet	Medium	N/A	Neutral	+	Neutral	+	County	$$$	$	DGS, M-NCPPC, MCPS	FRS, POL, OMB, MCDOT, OP, DEP

Subsector	Action	GHG Reduction*	Climate Risk Reduction	Racial Equity & Social Justice	Public Health	Environmental Stewardship	Economic Prosperity	Authority	County Investment	Private Investment	Lead	Contributor
T	T-7: Expand the Electric Vehicle Charging Network	Medium	N/A	Neutral	++	Neutral	++	Outside County	$$$	$$	MCDOT, DGS, DPS, M-NCPPC	DEP, WMATA, utilities
T	T-8: Transportation Demand Management and Telework Strategies	Low	N/A	+	++	Neutral	+	County with Change	$$$	$	MCDOT	Businesses with 25 or more employees, developers of projects in TMDs, DPS
T	T-9: Traffic Management Systems	Low	N/A	Neutral	+	Neutral	Neutral	Outside County	$$$	$$$	MCDOT, MDOT	SHA, municipalities
T	T-10: Electric Vehicle Car Share Program for Low Income Communities	Low	N/A	++	+	Neutral	+	County with Change	$$$	$	MCDOT	DEP; car share companies
T	T-11: Off-Road Vehicle Electrification	Low	N/A	-	+	Neutral	Neutral	County with Change	$$$	$$$	DEP	DOT, construction industry, MVA
T	T-12: Advocate for a Vehicle Carbon Gas Tax	N/A	N/A	Neutral	Neutral	Neutral	Neutral	Outside County	$	$	MCDOT	OIR, DEP
T	T-13: Advocate for Rail Alternative Fuels	N/A	N/A	Neutral	Neutral	Neutral	Neutral	County	$	$	MCDOT, MDOT/ MDTA	OIR
S	S-1: Retain Forests	Level TBD	Extreme Precipitation	+	++	++	+	County with Change	$$$	$	M-NCPPC	DEP, DPS
S	S-2: Increase Tree Canopy	Level TBD	Extreme Heat	+	++	++	+	County with Change	$$$	$	DEP, M-NCPPC	MCDOT
S	S-3: Restore Forests, Meadows, and Wetlands	Level TBD	Extreme Precipitation	+	++	++	++	County with Change	$$$	$	M-NCPPC	DEP
S	S-4: Regenerative Agriculture	Level TBD	High Winds	Neutral	+	+	Neutral	County with Change	$$$	$	Office of Agriculture, M-NCPPC	DEP, MCGB

Subsector	Action	GHG Reduction*	Climate Risk Reduction	Racial Equity & Social Justice	Public Health	Environmental Stewardship	Economic Prosperity	Authority	County Investment	Private Investment	Lead	Contributor
S	S-5: Restore Soil Fertility, Microbial Activity, and Moisture-Holding Capacity	Level TBD	Extreme Precipitation	Neutral	+	++	Neutral	County with Change	$$	$$	DEP	M-NCPPC
S	S-6: Whole-System Carbon Management and Planning	Level TBD	Extreme Precipitation	Neutral	Neutral	Neutral	Neutral	County	$	$	DEP, M-NCPPC	OMB (CountyStat), DOF, WorkSource Montgomery
A	A-1: Water Infrastructure Resilience	N/A	Extreme Precipitation	+	++	+	Neutral	Outside County	$	$	WSSC Water	DEP, municipalities, DC Water
A	A-2: Culvert Repairs	N/A	Extreme Precipitation	+	+	+	Neutral	County	$$$	$	DOT	DPS, M-NCPPC
A	A-3: Temperature Monitoring and Alerts	N/A	Extreme Heat	++	+	Neutral	Neutral	County with Change	$$	$	OEMHS	HHS
A	A-4: Extreme Weather Energy Efficiency Building Code	N/A	Extreme Heat	+	+	Neutral	Neutral	County with Change	$$$	$$	DPS	DHCA, MCGB
A	A-5: Climate-Adapted Housing Incentives/ Subsidies	N/A	Extreme Heat	+	++	Neutral	+	County with Change	$$$	$	DHCA, DEP	MCGB, DPS
A	A-6: Green/ Cool/PV Roof and Pavement Code	N/A	Extreme Heat	- -	++	+	++	County with Change	$$	$$$	DPS	DHCA, MCGB
A	A-7: Green Streetscape	N/A	Extreme Precipitation	Neutral	+	++	Neutral	County with Change	$$$	$	DEP, MCDOT	DPS, M-NCPPC
A	A-8: Harden Emergency Shelters and Install Resilience Hubs	N/A	Extreme Precipitation	++	++	Neutral	Neutral	Outside County	$$$	$	HHS	DGS, OEMHS, MCPS, FRS, DPS
A	A-9: Mold Protection and Remediation	N/A	Extreme Precipitation	++	++	Neutral	+	County with Change	$$$	$$	DHCA, DPS	DEP, MCGB
A	A-10: Green Infrastructure	N/A	Extreme Precipitation	Neutral	+	++	Neutral	County with Change	$$$	$$	DPS, DEP	MCDOT, M-NCPPC

Subsector	Action	GHG Reduction*	Climate Risk Reduction	Racial Equity & Social Justice	Public Health	Environmental Stewardship	Economic Prosperity	Authority	County Investment	Private Investment	Lead	Contributor
A	A-11: Climate Adapted Building Code	N/A	Extreme Precipitation	+	+	Neutral	Neutral	County with Change	$$$	$$$	DPS	DGS, DEP
A	A-12: Stormwater Retention Credit Trading	N/A	Extreme Precipitation	Neutral	+	+	Neutral	County with Change	$$	$	DEP	M-NCPPC, DPS
A	A-13: Ban Stormwater Management Requirement Waivers	N/A	Extreme Precipitation	Neutral	+	+	-	County with Change	$	$$	DPS	M-NCPPC
A	A-14: Update Floodplain Maps	N/A	Extreme Precipitation	Neutral	Neutral	Neutral	Neutral	County with Change	$$	$	DPS, OEMHS	M-NCPPC
A	A-15: Water Supply Protection	N/A	Drought	+	++	++	Neutral	County with Change	$$$	$	DEP, WSSC Water, M-NCPPC	Municipalities
A	A-16: Flood Rescue Resources	N/A	Extreme Precipitation	+	+	Neutral	+	County	$$$	$	FRS, POL, DOT	DGS, OEMHS, PIO
A	A-17: On-Site Water Reuse	N/A	Drought	+	Neutral	+	Neutral	Outside County	$$	$	DPS, WSSC Water	Municipalities
A	A-18: Expanded Community Gardens	N/A	Drought	+	++	+	+	County with Change	$	$	M-NCPPC	MCPS, OA, HHS
A	A-19: Advocacy for Off-River Water Storage	N/A	N/A	Neutral	Neutral	Neutral	Neutral	Outside County	$	$$$	DEP, WSSC Water	OIR
A	A-20: Study Potential for Buildings in the County to Flood and Possible Remedies	N/A	N/A	Neutral	Neutral	Neutral	Neutral	County	$$	$	DEP, OEMHS	DPS

Subsector	Action	Authority	Lead	Contributor
G	G-1: Build Awareness among All Montgomery County Government Staff about Climate Change	County	DEP	CEX, OHR, DGS, M-NCPPC, MCPS
G	G-2: Establish a Climate Change Academy to Integrate Climate Change Training into the Professional Development of Montgomery County Government Staff	County	OHR, DEP	CEX, Office of Racial Equity and Social Justice, DGS, Montgomery College, DNR, M-NCPPC, MCPS
G	G-3: Incorporate Climate Competencies Iinto Montgomery County Government Job Descriptions and Performance Plans	County	OHR	DEP, OLR, unions
G	G-4: Identify New Positions That are Needed for the County Government to Prepare for and Respond to Climate Hazards, Implement Climate Adaptation Measures, and Reduce Greenhouse Gas Emissions	County	OMB, OHR	All departments
G	G-5: Establish a Cross-Departmental Climate Innovation Lab to Develop, Fund and Implement Climate and Resiliency Initiatives	County	CEX (Office of Innovation)	DEP
G	G-6: Designate Climate Ambassadors Within Each County Department	County	CEX, DGS, DEP	All departments
G	G-7: Evaluate and Update County Planning, Policy, and Operations Activities to Account for the Risks of Climate Change Impacts and Prioritize the Needs of Vulnerable Residents	County	CEX, OEMHS	HHS, DOT, FRS, POL, M-NCPPC
G	G-8: Evaluate and Update County Planning, Policy, and Operations Activities to Reduce Greenhouse Gases	County	OP, CEX, DEP	All departments
G	G-9: Incorporate Climate Considerations into the County's Budgeting Processes	County	OMB, CEX, DEP	All departments
G	G-10: Develop Financing Strategies for Implementing Climate Actions and Incorporate Climate Considerations into County Finance Practices	County	DOF	OMB, MCGB, DEP, CEX, Board of Investment Trustees
G	G-11: Develop Climate, Energy, Health and Racial Equity Metrics And a Data-Driven Assessment and Reporting Process	County	DEP, DTS, OMB (CountyStat)	HHS (African American Health Program, Latino Health Initiative, Asian American Health Initiative)
G	G-12: Formalize the Climate Leadership Team to Guide the Implementation of Climate Plan Actions	County	CEX	All departments, independent agencies, and municipalities
G	G-13: Update the County's Teleworking and Transit Benefit Policies to Encourage MCG Staff to Reduce Vehicle Miles Traveled	County	OHR, DOT	DEP, DTS, OLR, OCA, CEX (Office of Innovation), DGS, unions
G	G-14: Establish Montgomery County Government Carbon Fund for Air Travel	County	DOF	DEP
G	G-15: Consolidate County Climate Data	County	DTS, OMB (CountyStat)	DEP, OEMHS, DOT, DPS, M-NCPPC
G	G-16: Conduct Climate Vulnerability Detailed Assessments	County	DEP	OEMHS, DOT, DPS

Subsector	Action	Authority	Lead	Contributor
P	P-1: Undertake Vigorous Public Outreach Campaign Aimed At Empowering the Public With Information on How to Reduce Emissions and Adapt to the Impacts from Climate Change	County	DEP, OEMHS, PIO	Community Engagement Cluster, Regional Service Directors, HHS, MCPS, M-NCPPS, civic and business community
P	P-2: Conduct an Outreach Campaign That Uses Evidence-Based Communications Strategies	County	DEP, OEMHS, PIO	Community Engagement Cluster, Regional Service Directors, HHS, MCPS, civic and business community
P	P-3: Form a Climate Change Communication Coalition	County	DEP, PIO	All departments, MCPS, M-NCPPC, civic and business community
P	P-4: Enhance County Websites to Focus More Sharply on Climate Change	County	PIO	All departments
P	P-5: Expand and Evolve The Resilience Ambassador Program to Advance Racial Equity and Climate Action	County	DEP	REC, HHS, DOT, Office of Racial Equity and Social Justice
P	P-6: Establish a Racial Equity and Climate Change Task Force to Advance Racial Equity and Climate Action	County	DEP	Office of Racial Equity and Social Justice, HHS, DOT, Climate Leadership Team
P	P-7: Use the Climate Energy and Air Quality Advisory Committee as a Resource to Advise the County on Performance Metrics and Plan Implementation	County	DEP	Climate Leadership Team
P	P-8: Facilitate Ongoing Input from Community Members on the Cap's Implementation	County	CEX, DEP	DOT, OEMHS, PIO, Community Engagement Cluster, Regional Service Directors, MCPS, M-NCPPC
P	P-9: Support the Efforts of Community Organizations, Businesses, and Associations That Promote and Operationalize Equitable Climate Action	County	DEP	Montgomery College, public libraries, civic and business community, Racial Equity and Climate Change Task Force, M-NCPPC
P	P-10: Engage County Artists through Public Art Installations to Raise Awareness, Discussion and Action on Climate Change	County	DEP	Arts and Humanities Council, Regional Service Directors, civic and business community, M-NCPPC
P	P-11: Establish a Statewide Coalition of Local Governments Focused on Advancing Ambitious State Climate Policy by Collectively Advocating their Positions before the State Legislature, Public Services Commission, and The Utility Companies	County	CEX	OIR, DEP
P	P-12: Establish Partnerships with Federal Agencies Located within the County's Boundaries on GHG Mitigation and Climate Resiliency Efforts	County	CEX	MCEDC, DEP
P	P-13: Advocate for Tthe Continued Integration of Climate Change Education into the Existing School Curriculum	County	MSDE, MCPS	DEP

Montgomery County CAP Appendix A: Full List of CAP Actions

Subsector	Action	Authority	Lead	Contributor
P	P-14: Develop a Standardized Climate Change Curriculum across Public Schools and Recommend the Same for Private Schools and Home Schools	County	MSDE, MCPS	DEP
P	P-15: Provide Professional Development for Educators on Climate Change Topics	County	MCPS	Montgomery College, DEP
P	P-16: Use School Gardens or Other Outdoor Learning Facilities as a Jumping Off Point to Address a Multitude of Climate Related Topics	County	MCPS	DEP, M-NCPPC
P	P-17: Develop Increased Opportunities for Students to Participate in Climate Change Learning Experiences Outside of the Classroom	County	MCPS	Local universities, non-profits, public libraries, Maryland Association for Environmental & Outdoor Education, (MAEOE), M-NCPPC, municipalities
P	P-18: Develop Sustainability Goals for Schools to Reach and Provide Incentives to Do So	County	MCPS	DEP
P	P-19: Encourage Climate Change Action at Home	County	MCPS	DEP, MCCPTA
P	P-20: Establish Cross-Departmental Partnership to Facilitate Implementation of Climate Goals at County Schools	County	MCPS	DEP, M-NCPPC,CUPF, DPS

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Appendix B: Workgroup Materials

Climate Planning Overview

What is the Climate Action & Resilience Plan?

The Plan, currently under development, will be a roadmap to achieve zero emissions in Montgomery County by 2035. Plan components will include:

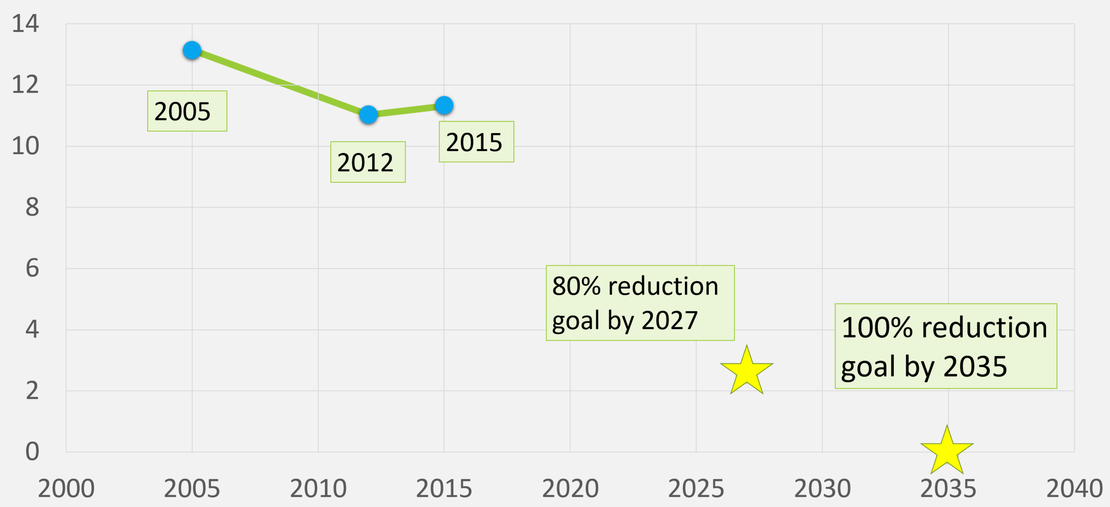
- Prioritized actions for reducing greenhouse gas emissions & adapting to a changing climate
- Implementation plan for actions
- Cost estimates and co-benefits
- Identification of equity challenges and opportunities

When will the Climate Action & Resilience Plan be done?

- July 2019 – February 2020: Workgroups convene and develop recommendations
- February – April 2020: Public review of Workgroup recommendations
- Spring – Fall 2020: Consultant technical analysis; continued public engagement
- Late 2020: Issue Draft Plan and provide opportunities for public comment
- **Early 2021: Finalize Climate Action & Resilience Plan**

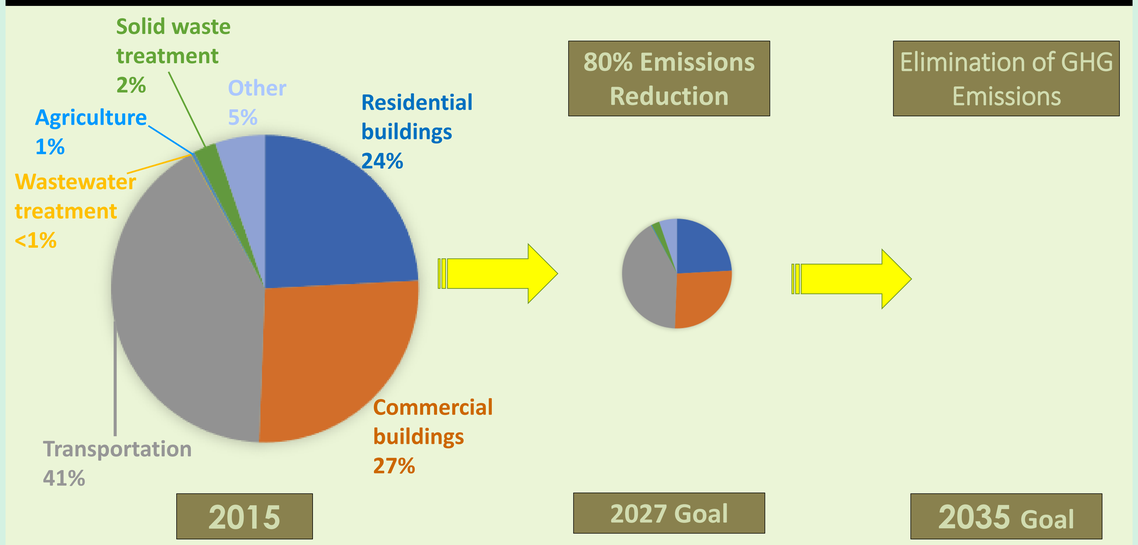
Montgomery County's Measured Greenhouse Gas Emissions

(million metric tons of CO2e)



Source: Metropolitan Washington Council of Governments (MWCOG) Montgomery County GHG Inventory

Montgomery County Greenhouse Gas Emissions Profile and Goals



For all Montgomery County climate workgroup recommendation materials, please visit: https://www.montgomerycountymd.gov/green/climate/climate-workgroup-recommendations.html

Buildings

Community-Based Workgroup Recommendations

Goal 1 - Understand the current and planned building stock in Montgomery County

1. **Perform research on the existing building composition** in the County (e.g., property use type, energy end uses, density, current technologies, building code compliance).

2. **Evaluate future development in new construction pipeline.**

Goal 2 - Expand access to programs and financing for commercial and residential buildings to make improvements

1. **Develop central repository of all financial incentives** that are available to Montgomery County commercial and residential building owners for energy efficiency (and renewable energy) upgrades.

2. **Create a "Retrofit Accelerator" program** to provide unbiased and individual guidance to commercial and residential owners to facilitate retrofits to existing buildings and design assistance for net-zero energy new buildings.

3. **Expand available incentive and financing program**s.

4. **Develop a training program/scholarship** in partnership with a University or Trade Association for facility managers/building operators on the latest energy efficient technologies.

5. **Develop/expand an appliance trade-in program** to encourage energy-efficiency appliance upgrades.

Goal 3 - Reduce GHG emissions from newly constructed/ planned commercial and residential buildings

1. **Increase Montgomery County's involvement in building code adoption process** to advance stronger energy efficiency standards in buildings.

2. **Adopt a path to net-zero energy and/or carbon building code** for new commercial and residential construction

3. **Adopt a path to electrification** in new construction.

4. **Consider embodied carbon requirements for building materials.**

Goal 4 - Reduce GHG emissions from existing commercial and residential buildings

1. **Implement/expand building labeling and transparency programs.**

2. **Implement a performance requirement** for existing buildings.

3. **Adopt a path to net-zero energy/carbon building code** for existing commercial and residential buildings.

4. **Adopt a path to electrification in existing buildings.**

5. **Reduce building heat transfer.**

Goal 5 - Improve water conservation and efficiency in buildings (energy-water nexus)

1. **Implement water efficiency requirements** for new buildings.

2. **Develop water efficiency incentives** for existing buildings.

3. **Modify building code to allow greywater** re-use in buildings.

Sequestration

Community-Based Workgroup Recommendations

Overarching Goals

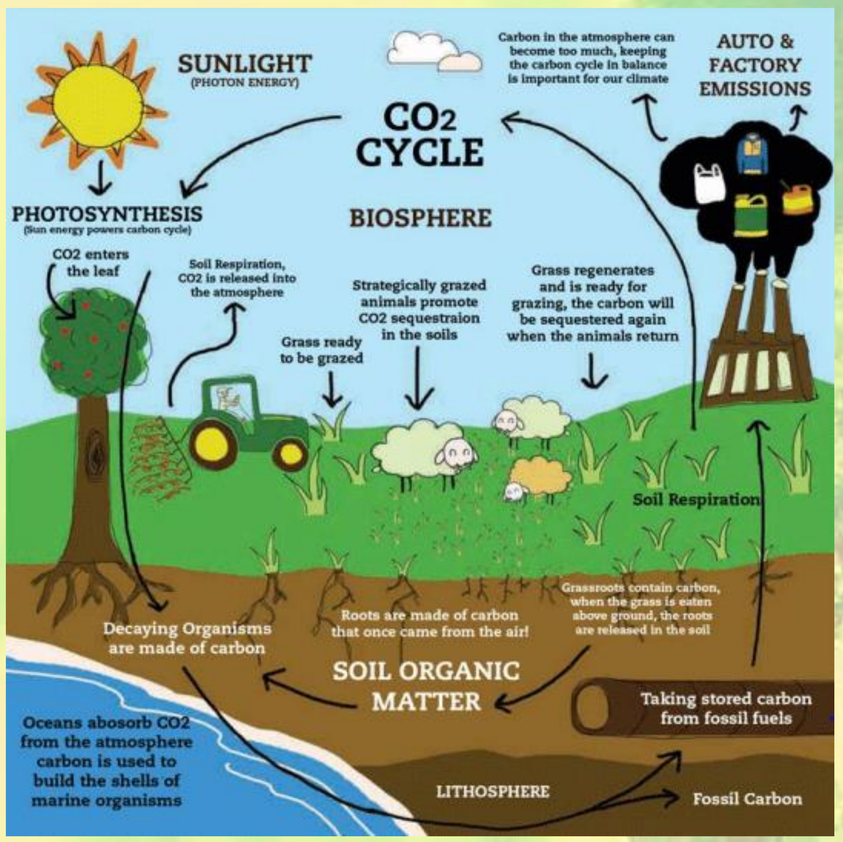
1. **Strengthen land use policies**: Provide a foundation for maximizing carbon sequestration and increasing resilience.

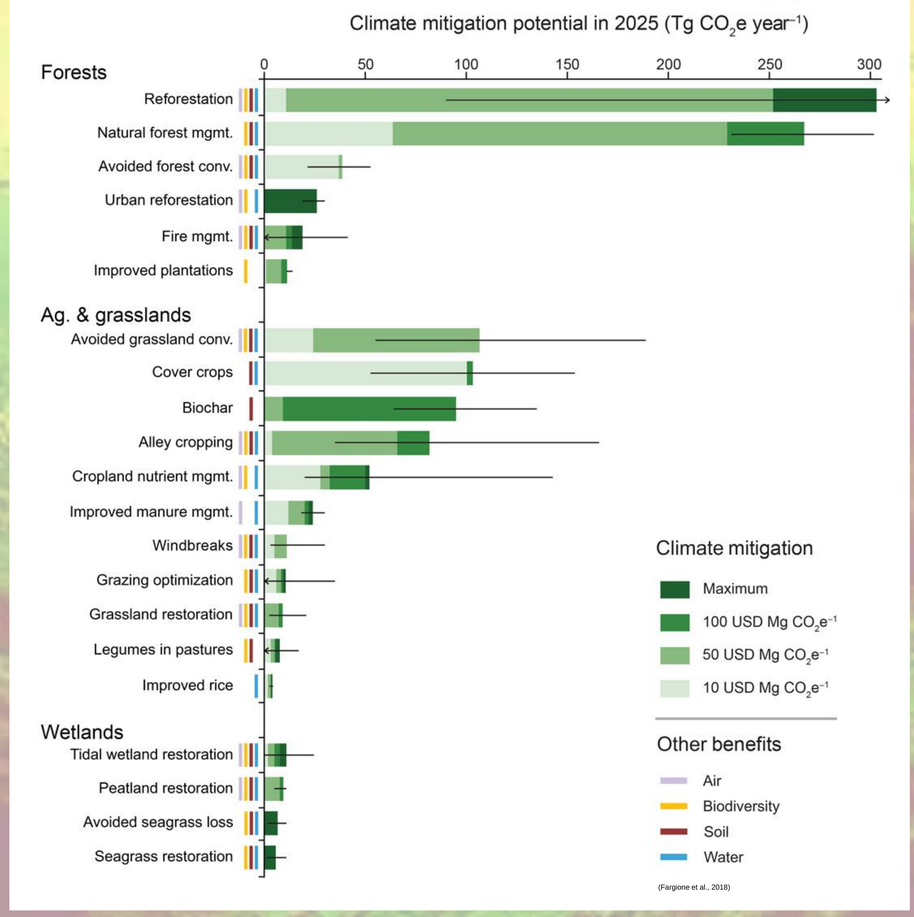
2. **Accelerate the implementation of nature-based solutions** as carbon sequestration strategies across all County programs and policies.

3. **Move from silos to systems change - taking a "whole systems" approach**: Enable innovation to increase carbon sequestration in ways that maximize co-benefits for adaptation.

Natural Climate Solutions

- Carbon sequestration: "process of **storing carbon in a carbon pool**".(1)
- **Carbon cycle** (see graphic): how carbon moves from the atmosphere to plants through photosynthesis, from plants to animals through food chains, from plants and animals to soils. At each stage: carbon is released and can be stored in trees, plants, roots, micro- and macro-organisms, soil, and water.(2)
- **Nature-based carbon-capture** methods (see chart): **land conservation and restoration, improved forest land management, restoring and protecting wetlands and grasslands, and improving agricultural land management** (like cropland and grazing practices, using cover crops, and compost application).(3) These methods are being studied globally as strategies to reduce emissions, sequester carbon, and provide additional **co-benefits**: **improved water filtration, flood protection, soil health, plant productivity, biodiversity habitat protection, pollinator protection, public health, and economic development**.(4)





Sector-Specific Goals

4. **Protect existing trees and double the tree canopy** in County's urban, suburban, and other non-forest areas, leading to a net increase in the amount of carbon sequestered in trees to 2030 and beyond.

5. **Prevent loss of natural wetlands and expand where possible**: Establish a strict policy of no further loss of the County's natural wetlands, and expand wetlands where possible.

6. **Increase the County's forests** to 37% forest area by 2027 and 45% by 2035 (as compared to 34% in 2001-2016).

7. **Transition to regenerative agriculture**: Engage and support farmers, gardeners, and their organizations in an aggressive transition to regenerative agricultural practices.

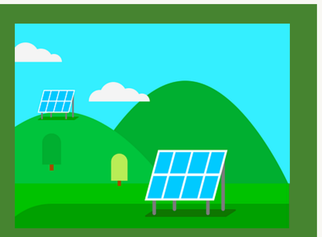
8. **Restore healthy soils**: Restore the Earth's carbon, water, and energy cycles as a key climate solution by restoring the soil's fertility, microbial activity, aggregate stability, and moisture holding capacity. Adopt promising new research, policies, financing instruments, and practices on soil organic carbon.

9. **Establish a County-wide composting system and increase compost use**: Close the loop by establishing a County-wide food and other organic waste composting system for government, commercial and residential buildings to reach a minimum of 70% diversion, and increase compost use to improve soil health and increase carbon sequestration.

References: (1) Glossary G.4 2019: Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
(2) https://portfolium.com/HelenPascualPe/portfolio. (3) J. E. Fargione et al., Natural climate solutions for the United States. Sci. Adv. 4, 2018.
(4) https://www.carbonbrief.org/analysis-how-natural-climate-solutions-can-reduce-the-need-for-becc.

Clean Energy

Community-Based Workgroup Recommendations



Goal 1. **Green the electricity supplied to County residents and businesses**

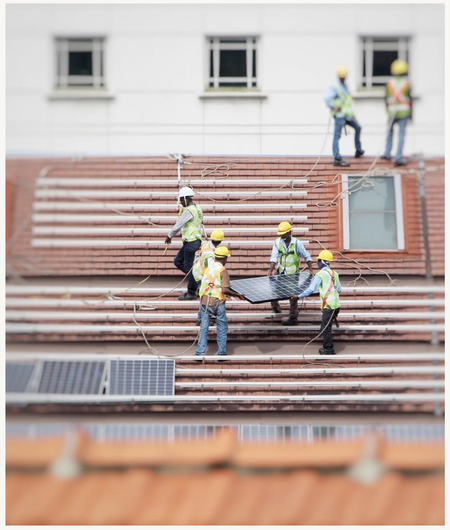
1. Modify existing or develop new **laws and policies at the State level to support greening the electricity supply**.
2. Develop a **Community Choice Energy program**.

Artwork by Iron & Earth (CC BY-SA)

Goal 2. **Expand use of distributed renewable energy**

1. Establish **engagement strategies, programs and financial tools to address cost barriers to onsite renewables and storage**.
2. Assess feasible **public and private locations for solar and wind installations** of various scales in Montgomery County and adjacent jurisdictions.
3. Expand use of **solar on public facilities**.
4. Support **modification of the State's net-metering law**, including addressing cap for individual projects (2 MW) and total project volume cap (1,500 MW).

5. Support **expansion of community solar**.
6. Working **with the Public Service Commission and electric utilities,** support an **assessment of the ability of utilities to incorporate additional distributed energy**.
7. Review the **feasibility of implementing more energy conversion efficiency technologies** in Montgomery County (i.e. co-generation, co-process, and heat recovery).
8. Review the **feasibility of creating/expanding other clean renewable energy technologies in Montgomery County (other than wind and solar)**.
9. Establish **demonstration projects to co-locate PV solar with agricultural production (such as grazing) and pollinator meadows**.
10. Develop **clean energy incentives for low-income and moderate-income households in certain zip codes.**

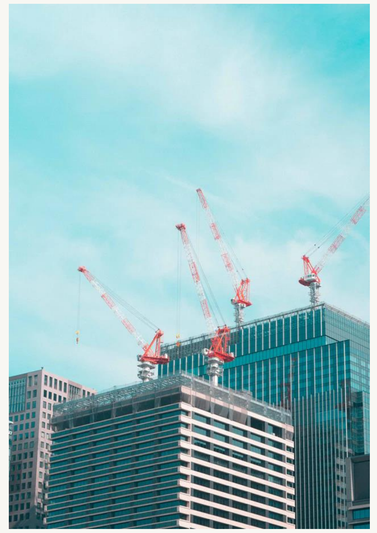


Goal 3. **Expand use of renewable energy to power buildings**

1. Evaluate **policies requiring the electrification of new, substantially modified, and existing buildings**.
2. Evaluate **policies prohibiting the use of natural gas in new, substantially modified, and existing buildings**.
3. Evaluate **policies requiring incorporation of solar, battery storage systems, and/or vehicle charging stations in new, substantially modified, and existing buildings**.

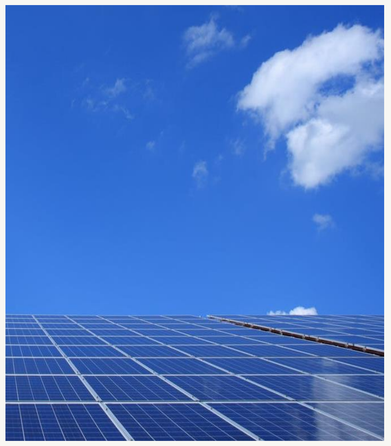
Goal 4. **Encourage economic development related to renewable energy**

1. Increase **education in renewable energy and sustainability**.
2. Establish a **Green Technology Innovation Fund to attract and support promising business start-ups that offer solutions to reduce GHG emissions and/or contribute to essential clean energy infrastructure**.
3. Encourage **social enterprises, non-profits, and small and local businesses to develop renewable energy solutions**.
4. Encourage **union workers to be contracted and develop renewable energy solutions**.
5. Promote an **economic transition that is just and fair for all workers, especially those that have been laid off by "conventional" power production**.
6. Emphasize the **clean energy future in K-12 school curricula** (Italy example as model) or **extracurricular programs**, especially in collaboration with Thomas Edison H.S. Use **solar and storage on all schools to educate students on environmental and energy issues**.
7. Explore more **public-private partnership opportunities** to support innovation.



Goal 5. **Establish a dedicated, secure funding source to support renewable energy programs and financial incentives**

1. Assess and implement a **carbon tax** in Montgomery County.
2. Develop **clean energy incentives for low-income and moderate-income households in certain zip codes, including Prince George's County**.



Adaptation

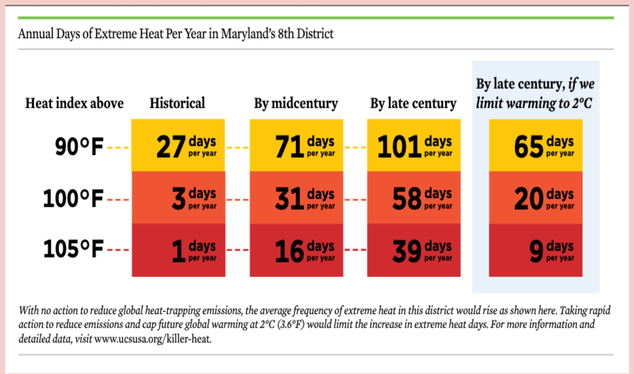
Community-Based Workgroup Recommendations

Goal 1 - Prioritize people and communities that are the most vulnerable and the most sensitive to the impacts of climate change

1. Adopt strategies and actions that focus on building resilience for vulnerable and marginalized communities
2. Prioritize reducing health risks of the most vulnerable populations.

Goal 2 - Reduce the risks and impacts of higher summer temperatures.

1. Establish county-wide temperature reduction goals.
2. Promote cool and energy efficient building standards for both the public and private sectors.
3. Expand the county's urban canopy and greening programs.
4. Promote landscaping in the private sector to expand shade and reduce urban heat islands.

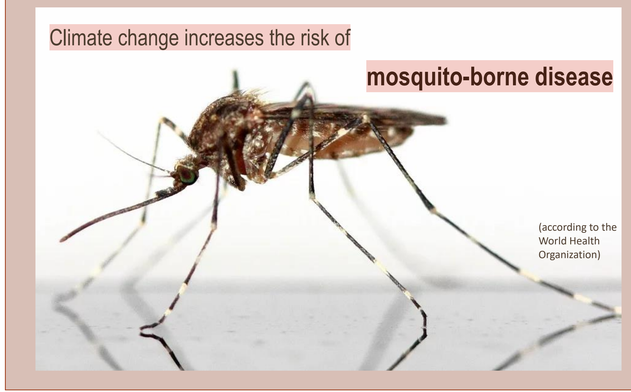


Goal 3 - Reduce risks and impacts of more intense storms.

1. Improve hydrological and meteorological data collection and analysis of wet weather and storms, considering climate change over the next 30 to 100 years, and incorporating trends in land use/land cover change.
2. Adopt aggressive requirements for all new development to transition Montgomery County to realities of climate change.
3. Work with homeowners, businesses and the building and services sectors to retrofit existing homes and buildings to protective standards.
4. Initiate a comprehensive review of transportation infrastructure, dams, and other public utilities and undertake efforts to improve preparedness and resilience.

Goal 4 - Protect public health from climate-driven impacts.

1. Integrate climate change risks into Montgomery County health and human Services, hazard mitigation, and emergency response operations
2. Minimize food, water and vector borne disease.
3. Protect the most vulnerable from asthma, heart attacks, and other respiratory illnesses.
4. Guard against Increasing Risks of motor vehicle accidents and drowning
5. Undertake a vigorous public outreach campaign aimed at empowering the public with the knowledge and support to avoid and minimize health effects of climate change.

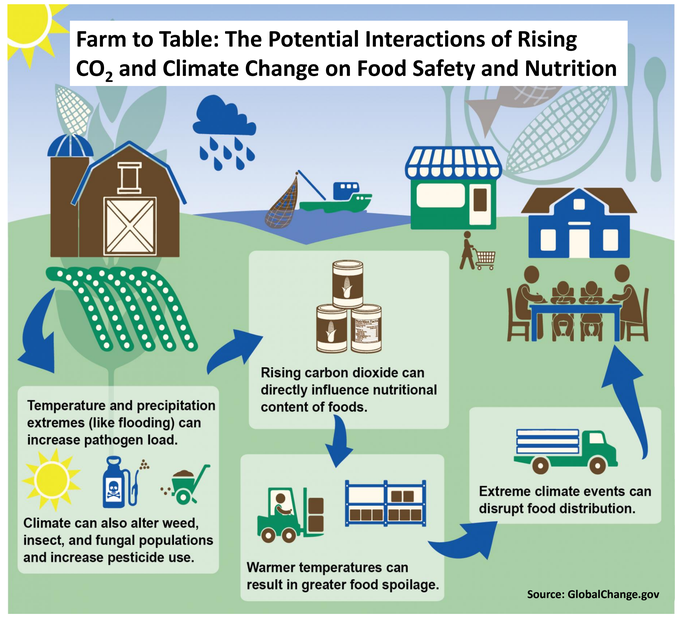


Goal 5 - Ensure the availability and sustainability of quality drinking water supplies to support a growing and thriving Montgomery County.

1. Expand programs to develop localized self-sufficiency and resilience to water shortages.
2. Protect water quality that threatens potability of water supplies.
3. Integrate actions that recognize the inter-dependency and co-benefits between water, energy, and other resilience strategies.

Goal 6 - Conserve and restore habitat to support healthy populations and ecosystems, reduce non-climate stressors on natural resources, and promote climate-resilient agriculture.

1. Conserve, expand, and connect natural and protected areas.
2. Restore degraded habitat and enhance suburban habitat.
3. Manage invasive and non-native species.
4. Reduce non-climate stressors on native species and ecosystems.
5. Promote climate-resilient agricultural practices.



Goal 7 - Support economic opportunities and address economic challenges for climate adaptation.

1. Business and development: minimizing disruption and maximizing opportunities.
2. Financing adaptation.
3. Incentivizing adaptation.

Goal 8 - Conduct a vigorous outreach and engagement campaign to accelerate adaptation and resilience.

1. Build public awareness about the County's actions on hazard mitigation and adaptation to climate change.
2. Build community preparedness strategies to increase resilience.
3. Engage the business community about the potential impacts and opportunities posed by climate change.
4. Work with other jurisdictions to develop rules, amend codes, and build capacity for adaptation.

Goal 9 - Reevaluate and update county operations, strategies, and codes to account for the risks of climate change impacts as well as to reduce greenhouse gases.

1. Create a common set of projections for Montgomery County using moderate to high projections of greenhouse gas scenarios.
2. Conduct a bottom-up evaluation of county departments, operations, and facilities and update county codes, operations, and services.
3. Implement and Improve the County Hazard Mitigation Plan.
4. Revise county codes, operations, and services to incorporate consideration of impacts of climate change.
5. Update Data, information, and monitoring to inform risk assessments.

Continuous Improvement, Institutionalization, and Accountability

Goal 1 - Government capacity - Develop county leadership, staff, organization and fiscal capacity to implement government-wide climate action programs across all departments and agencies

1. Evaluate current government culture, structure, assets and support systems to develop interventions that will ensure successful implementation of the Climate Action Plan
2. Establish working groups to implement the CARP
3. Build workforce capacity for change and leadership

Goal 3 - Government Leverage Points - Integrate climate awareness and action into County decision making, policies and institutional culture

1. Incorporate consideration of GHG emissions into the budgeting, finance and procurement processes

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Goal 2 - Partnerships and Stakeholders - Build and institutionalize community and State jurisdictional partnerships to generate a critical mass of stakeholder support, and to foster collaboration, collective action, and equitable implementation

1. Identify stakeholder concerns and possible co-benefits to climate action by inviting input and incorporating feedback from stakeholders
2. Communicate status and results of CARP to the public and other stakeholders
3. Develop coalition of civic and business leaders to ensure ongoing communication between the County and the community
4. Stimulate "social entrepreneurism" by establishing a grant program to support community-based innovations to address the County's climate goals
5. Build collaborative support among other MD jurisdictions to address ambitious climate change policies at the State level

Goal 4 - Economic development - Strategically integrate economic development and climate goals to advance both

1. Encourage green business entrepreneurism, innovation and investment
2. Promote the production and sale of local products and services
3. Aggressively promote businesses that embed social and environmental practices into their day-to-day operations

Goal 5 - Unions, Labor and Jobs - Partner with unions and businesses to advance climate goals, identify clean energy job opportunities and facilitate a just transition to a fossil-free economy

1. County management, labor and environmental organizations should embrace the collaborative concept of *Bargaining for the Common Good* to advance climate goals that benefit both union members and the wider community
2. Proactively consider both economic opportunities and the adverse impacts associated with the transition to a carbon free economy

Empowering & Engaging Youth Through Education

Goal 1 - Community as a Resource: Develop increased opportunities for students to participate in climate change experiences outside the classroom

1. Encourage youth and their families to patronize businesses whose main goal is to reduce GHG emissions
2. Develop climate change opportunities that engage students in climate discussions/activities
3. Partner with federal and local agencies, non-profits and other County departments

Goal 2 - PK– 12 Formal Education: Develop increased opportunities for students to participate in climate change education and experiences in the classroom of private, public, and home school communities

1. Frame the conversations of adults/educators with students/children away from fear/worry about climate change, to how to empower students with knowledge about what climate change is, how it will impact them, and what they can do in their daily lives to assist
2. Develop the students' knowledge on climate change through new and already existing activities provided by the school
3. Ensure that students have an opportunity through the science curriculum to analyze data and draw conclusions about climate science
4. Empower students to take action on environmental and climate issues
5. Ensure that homeschooled families have access to climate change information and data
6. Ensure that private schools in the county have access to current climate change information and data
7. Facilitate access by students to their schools' (public, private and homeschool) data on their environmental impact

Goal 3: At home: encourage climate change education in the home setting

1. Practice sustainability at home from a young age for the child

Goal 4 - Incorporate climate change education in the students' everyday lives

1. Promote commitment among students to help reduce their carbon-footprint and learn about climate change

MCPS Bulletin, https://bit.ly/38WWu1x

Goal 5: Incorporate climate change in extracurriculars

1. Allow students to learn about climate change outside of the regular classes

Public Engagement: Community-Based Workgroup Recommendations

Evidence-Based Communications & Behavior Change

Recommendation 1: Increase and stimulate internal climate action communications across County divisions.

1. County should host an internal government kick off climate change meeting to elevate the issue and demonstrate it's a county government priority that all agencies should support.
2. County should integrate climate change messages throughout the government to change internal behaviors and decisions.
3. Any legislation from county council should align and prioritize the work of the workgroups.
4. Establish an interagency climate change group with leadership from each division and comm leads; meet quarterly.

Recommendation 2: Showcase county's climate action activities and commitment via external communications

1. County should institutionalize a steady drumbeat of outreach from EVERY division.
2. Communicate county's progress in implementing climate action recommendations (Data & Results). Integrate climate change messages into county outreach.
3. Include climate change connection messages when there are emergency events.
4. As county implements emission reducing activities, publicize examples for community.

Montgomery County, CC license, https://bit.ly/2SV59MI

VisitMontgomery.com, https://bit.ly/2PmOTBT

Recommendation 4: Prioritize communicating climate change solutions that require and benefit most from public stakeholder engagement and support.

1. Prioritize what benefits most from public engagement (using resources wisely).
2. Use the process flow to determine what actions are promoted in the campaign.

Recommendation 3: Develop and Use Evidence-based Communication Messages

1. Based on communication theory and effective practices, create a communication message box of core messages that should be shared in ALL external communications.
2. Create Communication Process flow (slide 19). The process flow will help to determine which recommendations will be highlighted in the campaign.
3. Core Messages include: Health, Local, Urgency, Legacy, and Economics. "Your health and our community will benefit from these changes!"
4. Establish additional core messages relevant to each County division.
5. Provide regular trainings on communications research and behavior change related to climate change for government communications officers.

Recommendation 5: Engage and facilitate action through ongoing external stakeholder actions (meet residents where they are)

1. Implement broad public relations campaign to encourage stakeholder engagement that supports broader and more significant urgent county changes.
2. Form a standing Climate Change Communication Commission or Committee of Climate Change Ambassadors from the community.
3. Develop and implement business outreach strategy.
4. Develop and implement strategies for various stakeholder groups.

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Recommendation 6: Engage community as partners and support their needs so they will take action on a personal level and support Montgomery County activities.

1. Make the community feel seen, heard, and valued by placing humans and human needs at the center of the communication work.
2. Move away from extracting information from people to inform the plan and bring people in as partners so they contribute to and are a part of the plan.
3. "Implementation partners" could be youth (receiving SSL hours or college credit for their work), faith communities (receiving small grant), etc. – some "compensation" that shows value for time and commitment.
4. What do you need? … and what climate action will help address that need. (focus on listening rather than telling so that people can see themselves in it).
5. Use the volunteer ambassadors to facilitate the dialogue in neighborhoods.

Racial Equity, Social Vulnerability and Community Partnerships

1. Build Strategic Partnerships to Meaningfully Engage Frontline / Underserved / Vulnerable Communities as Owners of Climate Action & Resilience Plan

a) Coordinate an inclusive and well-resourced process for feedback/participation from underserved and structurally vulnerable communities, so that community members have ownership in the evolving Climate Action and Resiliency Plan (CARP)
   - Meet communities where they are at and seek ideas and engagement that will advance ownership for underserved residents, and develop out CARP in a way that lifts up diverse cultures of Montgomery County rather than targeting outcomes that will perpetuate inequities and conformity
   - Recognize that specific goals of CARP will not align with community priorities, and an equitable CARP requires intersectional work at the County level & at MCPS that advances community priorities around housing, education, policing reform and other key issues

b) Engage key stakeholders for implementation of Climate Justice Conversations

c) Resource community members to engage and integrate their feedback with services and stipends - such as participation and transportation stipends, childcare, food

d) Develop network to sustain community outreach and engagement, inclusive of diverse Montgomery County communities and not limited to engaged and better-resourced residents. Possible names: Community CAN (Climate Action Network) or Community CARE (Climate Action & Racial Equity) Network

e) Build visibility campaign to communicate Montgomery County values and action on equity to residents

f) Develop metrics that demonstrate accountability to inform residents of climate goals, progress and benefits

2. Integrate Climate & Energy Justice into County Systems

a) Integrate across functions (Hiring, Staff training, Procurement, Development, etc.)

b) Integrate across service areas (HHS, MCPS, DEP, Recreation, etc.)

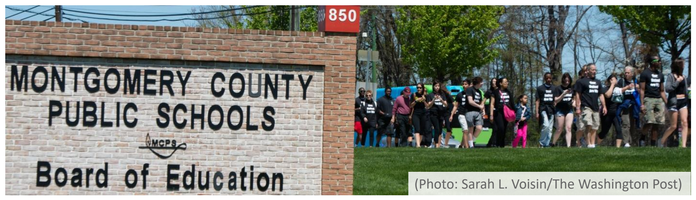
c) Practices & processes integrate climate & energy justice (e.g. into equity training for county staff)

d) Seek informed partners

e) Recognize the County's own internal challenges (e.g. Information Silos) and external threats (e.g. federal/national anti-immigrant chilling effect) undermining engagement of diverse communities

f) Reform the development process in Montgomery County for sustainable outcomes that promote real community engagement & power, and improved environmental & health outcomes

g) Use a deep intersectional systems change approach, building on recent work toward dedicated progress on racial equity & social justice



(Photo: Sarah L. Voisin/The Washington Post)

3. Ensure Funding Sources for Climate Change work

a) Utilize traditional and innovative means

b) Allocate budget to programs (e.g. Racial Justice Office, Minority Initiatives) engaging communities on climate as well as programs within agencies that support decentralized equity work - without prioritizing funding to both resource County capacity and engagement of community members, we cannot achieve the systems change necessary to lead on an equitable energy future that benefits all and includes all Montgomery County communities

c) Create sustainable funding workgroup

Highest near-term priorities include…

- Ensure that the County selects **at least one consultant with energy justice expertise (through a racial equity lens)** in the next phase of this process
- **Launch efforts to reform the development process** through an equity lens -- calls for its own workgroup
- **Fund equity work** and prioritize expanding funding and exploring new funding opportunities.
- **Provide context and support for Racial Equity & Social Justice Office** to incorporate elements of climate & energy justice into intersectional training curriculum for all County Employees & Advisory Committee Members (key stakeholders in an inclusive process)
- **Start the process of deep community engagement and continuous feedback *now*** -- take the first steps toward working with equity partners on a well-resourced process for input and participation from underserved communities on the evolving Climate Action & Resilience Plan (CARP) and a resiliency study, and begin to connect engaged community members and key stakeholders through a first version of a Climate Action Network / Community CARE Network; engage Ethnic Advisory Committee Members, MORE Network, Racial Equity & Social Justice Committee

Photo: Neville Elder/ The Elders , People's Climate March.

Key Considerations

Photo: Interaction Institute for Social Change

Be Real about the Challenges for Vulnerable Communities

Montgomery County has made strong commitments to inclusive values in the current federal era. Despite efforts to date by the County to communicate these values, the federal government's policies and treatment have endangered many residents, including immigrants, communities of color, LGBTQ communities, and people with disabilities and chronic health conditions. The damage has been done. We need to be realistic about the challenges involved in engaging communities -- and that we must meet these challenges with a ferocious justice response. We are continuing on a journey to build a better Montgomery County for all, and we have a long way to go.

Seek Informed Partners

At least one consultant the County works with on the Climate Action Plan should have the following energy justice skills: a) an intersectional lens to community-driven solutions and a racial justice focus, b) an understanding of The Jemez Principles for Democratic Organizing; and c) a background in the fundamentals of environmental justice and energy burden -- including the impacts of extractive development and pollution on frontline communities, and the higher percent of income low-income families must spend on utility bills

Work Intersectionally

People of color in Montgomery County represent close to 50% of the County's population, and experience significantly worse outcomes across many areas of policy. To pursue progress in climate and energy equity, the County must move forward from institutionalizing racial equity and social justice towards intersectional policy improvements that will target closing these gaps while bettering the lives of all residents. See the statistics and recommendations from the Racial Equity Profile.

Target Communications and Benefits Appropriately

The County should target / tailor communication efforts and benefits appropriately to differing audiences. Underserved community members should be primary beneficiaries and invited to learn how changes will benefit them and only asked to participate if resourced to do so. Community members with comparatively more privilege and resources should be given opportunities to step up and contribute to a more equitable and sustainable Montgomery County.

Engaged in a Well-Resourced, Inclusive Process

The County must prioritize near-term investments in funding deep equity work, including resourcing community members to engage in an inclusive process on evolving the Climate Action Plan in development.

Systems Change is Key…

to building a racially and socially just Montgomery County that leads on decisive, game-changing action to address the climate crisis, mitigate the impacts, protect our environment, and improve the health of our communities.

Don't Silo!

Silos in government and in our community challenge our collective ability to achieve real progress. The County must continually seek to identify and remove barriers to communication and collaboration

Transportation: Electric and Alternative Vehicles

Community-Based Workgroup Recommendations

Personal Electric Vehicles (EVs)

Goal 1 - Minimize use of existing Internal Combustion Engine (ICE) vehicles via accelerated decommissioning

1. Provide compelling financial incentives to get rid of ICE vehicles
2. Give special attention and incentives to financial considerations for low-income residents
3. Promote lower Vehicle Miles Traveled (VMT) of ICE cars by making driving ICE more expensive, taking into account equity concerns (with waivers that would be phased out over time)

Goal 2 - Decrease purchases of new and used ICE vehicles

1. Provide financial disincentives for purchase of high Greenhouse Gas (GHG)-emitting vehicles
2. Pass legislation, regulation, and/or ordinance discouraging or restricting sale and/or registration of ICE vehicles

Goal 3 - Speed transition to EVs by incentivizing EV purchases

1. Improve financing options and incentivize via financing
2. Eliminate or reduce county fees and/or taxes when purchasing EVs
3. Provide & publicize non-financial perks to EV owners
4. Leverage potential partners (who stand to benefit financially with increased EV adoption) to incentivize purchases
5. Provide increased financial incentives for low income residents, especially those dependent on cars

Goal 4 - Increase overall public acceptance and desirability of EVs

1. Educate general public to transform views and expectations on EVs as obvious choice in car sales
2. Improve/demystify EV/ZEV car-buying experience
3. Develop cadre of trained professionals to assist with these goals
4. Mandate or incentivize dealerships to promote EVs
5. Increase ZEV options for public if/when technology develops
6. Ensure that county operations convey preparedness and confidence

Goal 5 - Set clear targets and benchmarks to gauge success

1. Establish oversight group to identify and reach consensus on targets, gauge progress, create and modify strategies

Charging Network

Goal 6 - Increase access to public charging stations

1. Identify target number of charging stations
2. Commit to significantly increasing number of publicly available chargers
3. Increase access to charging stations in county govt buildings & county-owned parking lots

Goal 7 - Increase installation of chargers, and EVSE chargers in particular, at homes & businesses

1. Reduce barriers to EVSE installation
2. Offer financial incentives to install charging stations in existing buildings
3. Align real estate sales and rental required procedures to expedite expanded infrastructure
4. Ensure every new building in the county is EVSE-ready
5. Ensure EV owners in existing apartment buildings have access to charging

Goal 8 - Increase access to charging at the workplace

1. Identify & implement incentives

Goal 9 - Expand public access via innovative placement and providers

1. Ensure that all residences have access to charging within a set distance
2. Increase ease of commuter charging
3. Ensure emergency charging is available via mobile chargers
4. Use emerging/innovative steps in latter half of the 21st century

Goal 10 - Increase access to charging for out-of-town travelers

1. Require all temporary lodging (hotels, etc.) provide EVSE access

Goal 11 - Develop and optimize partnerships to achieve goals

1. Establish productive working relationships with appropriate partners (including clean energy providers) to reach consensus, identify areas of mutual benefit & achieve economies of scale
2. Work with clean energy providers to charging potential of clean energy sources

Goal 12 - Increase consumer confidence via education and outreach

1. Ensure that consumers & users are well-informed re: charging infrastructure & have high degree of confidence that charging is available to meet needs

Alternative Vehicles

Goal 13 - Increase the use of less energy-intensive non-traditional vehicles

1. Promote and facilitate broader use of smaller, less-energy-intensive, non-traditional vehicles

Medium & Heavy-Duty Vehicles

Goal 19 - Expand the use of clean fuels in medium- and heavy-duty trucks and other commercial vehicles

1. Require full electrification of vehicles as where technologically feasible
2. Minimize emissions of vehicles until electrification is viable
3. Encourage electrification (battery or water-based fuel cell) of heavy-duty vehicles where technology is not currently viable

County Fleets

Goal 20 - Minimize barriers to electrifying county fleet

1. Ensure charging infrastructure is adequate

Goal 21 - Electrify county automotive (and similar) fleet

1. Accelerate transition of county-owned automobiles and other vehicles to all-electric
2. Reduce size of county administrative fleet

Goal 22 - Use contracting requirements to speed and expand transition to electric vehicles

1. Use contracting requirements (in the permitting bid process) to specify electric vehicles where possible, and low-emission practices where not yet possible

Transit

Goal 14 - Ensure all County public transit buses are electrified

1. Accelerate transition to 100% electric transit buses - either battery electric or water-based hydrogen fuel cell
2. Research and act upon innovative practices to minimize County costs
3. Track and ensure accountability on progress

Goal 15 - Electrify all first-mile/last-mile transit

1. Ensure that all first-mile/last-mile (on demand) transit is electric

Goal 16 - Ensure electrification of taxi and ride-share vehicles

1. Establish goals and deadlines and implement strategies to achieve 100% electrification of taxi fleet and car sharing services

Goal 17 - Ensure all MoCo school buses are zero-emission

1. Accelerate adoption of EV School Buses
2. Use innovative measures to expand use and reduce net cost
3. Track and ensure accountability on progress

Goal 18 - Ensure that all private and other buses operation in the county are zero-emission

1. Ensure that all transit vehicles belonging to other entities are ZEV

Other Fleets

Goal 23 - Facilitate and simplify process for fleet purchase of EVs

1. Demonstrate financial sense of EVs to fleet managers/owners
2. Streamline charger requirements

Goal 24 - Provide financial incentives for fleet purchase of EVs

1. Incentivize electrification via taxes & fees
2. Provide direct financial incentives
3. Incentivize via preferential treatment in purchasing

Goal 25 - Use targeted legislation to achieve goals

1. Mandate fleet transition to EVs

Advocacy

Goal 26 - Ensure that state policies encourage synergy with MoCo programs

1. Work with Maryland legislature to enact policies and legislation that incentivize electrification
2. Advocate for legislation to rid grid of carbon-based energy sources in order to achieve carbon-free charging
3. Work with Public Service Commission (PSC) to allow policies that incentivize electrification
4. Advocate for Maryland to meet or exceed CAFE (fuel efficiency) standards for most progressive US state

Goal 27 - Ensure that interstate policies encourage synergy with MoCo programs

1. Work with legislators from surrounding states to achieve regional GHG reduction goals

Goal 28 - Ensure federal policies encourage synergy with MoCo programs

1. Advocate for strong Federal support, subsidies, and technology development to spur EV adoption

Transportation

Community-Based Workgroup Recommendations

Walkable and Bikeable Communities

Goal 1 - Prioritize planned bicycle and pedestrian projects

1. Implement Bicycle Master Plan and Pedestrian Master Plan projects

Goal 2 - Ensure low-stress infrastructure exists for cycling and walking

1. Prioritize projects that achieve a low-stress cycling/walking network
2. Improve wayfinding for bicycling routes
3. Ensure resiliency in the face of increased extreme weather events

Goal 3 - Enhance Safe Routes to School activities and school zone infrastructure

1. Prioritize cycling/walking to school
2. Instruct all elementary school students how to ride a bicycle and be safe pedestrians
3. Increase multimodal transportation options for students

Photograph: Evy Mages

Goal 4 - Modify roads to better serve non-motorized transportation needs

1. Identify roads with high volume of car traffic to be put on a 'road diet' - reducing lanes, increasing sidewalk capacity, adding bike lanes, adding stormwater/rain gardens, tree canopy, lane changes during rush hour, traffic calming devices
2. Repurpose space that currently serves vehicles to be used by non-motorized modes
3. Modify traffic flow

Goal 5 - Ensure availability of non-motorized vehicles.

1. Expand and regulate dockless transportation options

Goal 6 - Familiarize citizens with bicycling and walking through outreach and transportation demand management

1. Prioritize cycling/walking to school
2. Instruct all elementary school students how to ride a bicycle and be safe pedestrians
3. Increase multimodal transportation options for students

Transportation Demand Management

Goal 1 - Increase Public Transit Ridership

1. Improve transit services
2. Increase availability of transit benefit programs to reduce the cost of transit

Goal 2 - Implement Improvements to Auto-Based Infrastructure to Support GHG Goals

1. Retrofit existing roads and right-of-ways (ROW)s to obtain optimal efficiency
2. Retrofit existing parking to support goals

Goal 3 - Adopt Policies to Support Reduction in Vehicle Use

1. Adopt policies to reduce auto, TNC, and truck use
2. Adopt policies to reduce road construction

Goal 4 - Adopt Policies to Promote Supportive Land Use & Development

1. Adopt policies to promote infill development & use of existing transit resources
2. Adopt policies to increase provision & use of non-auto options

Goal 5 - Implement Community-Wide Climate Awareness Outreach & Incentives Strategy

1. Create additional touchpoints for carbon emission awareness

Goal 6 - Additional Transportation Demand Management Ideas That Are Not Covered Above (That Will Reduce GHG Emissions Significantly)

1. Carbon Tax

MONTGOMERY COUNTY CLIMATE WORKGROUP RECOMMENDATIONS

Overview:

These recommendations were developed by Montgomery County's community-based climate workgroups. All 850 recommendations developed by the workgroups are included in this document. The County will continue to work with the public to evaluate and refine the recommendations, in order to finalize a Climate Action and Resilience Plan by early 2021.

You can share your comments on any or all of the recommendations by going to Montgomery County's Climate Web Page.

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Buildings Workgroup

Goal 1 – Understand the current and planned building stock in Montgomery County

Strategy 1.1 – Perform research on the existing building composition in the County (e.g., property use type, energy end uses, density, current technologies, building code compliance).

> Action 1.1.1 – Conduct a survey of property owners/managers in the County to baseline building activities, evaluate energy efficiency opportunities/barriers/programs.
>
> Action 1.1.2 – Develop a comprehensive directory of top energy consumers and high-performance buildings by industry/location/ownership.

Strategy 1.2 – Evaluate future development in new construction pipeline.

> Action 1.2.1 – Collaborate within government and with outside stakeholders to improve the County's development review process and find opportunities to discuss sustainability improvements with developers.

Goal 2 – Expand access to programs and financing for commercial and residential buildings to make improvements

Strategy 2.1 – Develop central repository of all financial incentives that are available to Montgomery County commercial and residential building owners for energy efficiency (and renewable energy) upgrades.

Strategy 2.2 – Create a "Retrofit Accelerator" program to provide unbiased and individual guidance to commercial and residential owners to facilitate retrofits to existing buildings and design assistance for net-zero energy new buildings.

Strategy 2.3 – Expand available incentive and financing programs.

> Action 2.3.1 – Establish a dedicated fund (e.g., Fuel Energy Tax) to provide robust County energy programs.
>
> Action 2.3.2 – Adopt a County-wide incentive program for building density bonus
>
> Action 2.3.3 – Revamp County-level financial incentives (e.g., grants/tax rebates/APFO fee reductions) for commercial and residential buildings for completing deep energy retrofits, energy audits, energy management activities, or innovative pilot projects.
>
> Action 2.3.4 – Collaborate with utility partners to expand on-bill financing of energy efficiency upgrades for all customers.

Strategy 2.4 – Develop a training program/scholarship in partnership with a University or Trade Association for facility managers/building operators on the latest energy efficient technologies.

Strategy 2.5 – Develop/expand an appliance trade-in program to encourage energy-efficiency appliance upgrades.

Goal 3 – Reduce GHG emissions from newly constructed/planned commercial and residential buildings

Strategy 3.1 – Increase Montgomery County's involvement in building code adoption process to advance stronger energy efficiency standards in buildings.

Action 3.1.1 – Coordinate all County government agencies with International Code Council (ICC) membership to vote on code cycles.

Action 3.1.2 – Establish a formal public-private stakeholder task force on building code adoption to advise the County government and improve transparency.

Strategy 3.2 – Adopt a path to net-zero energy and/or carbon building code for new commercial and residential construction

Action 3.2.1 – Develop a County-provided best practices list for high-performance energy conservation measures in new buildings.

Action 3.2.2 – Adopt a "stretch code" program (requirements or alternative compliance paths that are more aggressive than base code).

Action 3.2.3 – Pilot and assess different high-performance building standards buildings beyond current IgCC/LEED requirements (e.g., Passive Haus, Net Zero Energy/Water/Carbon/Waste, WELL Building Standard, Living Building Challenge).

Action 3.2.4 – By a date certain, require that all new construction meet net-zero energy (or equivalent) requirements.

Strategy 3.3 – Adopt a path to electrification in new construction.

Action 3.3.1 – Ban natural gas in new buildings.

Action 3.3.2 – If a new building must use natural gas for a justifiable purpose, allow natural gas in buildings only if higher energy efficiency standards are met.

Action 3.3.3 – Require emergency back-up generators in new construction be fueled with bio/renewable sources.

Strategy 3.4 – Consider embodied carbon requirements for building materials.

Action 3.4.1 – Incentivize the reuse of existing old stock buildings (rather than tear-down + new construction) with financial incentives.

Action 3.4.2 – Adopt a path to incentivize/require materials and technologies (e.g., low-co2 concrete) that reduce embodied carbon in new construction projects

Goal 4 – Reduce GHG emissions from existing commercial and residential buildings

Strategy 4.1 – Implement/expand building labeling and transparency programs.

Action 4.1.1 - Expand County Benchmarking Law to include more commercial/multifamily buildings and/or new reporting requirements, such as water data or audits.

Action 4.1.2 – Expand Benchmarking Law disclosure requirements to include an energy rating displayed on buildings, like restaurant grades.

Action 4.1.3 – Organize a voluntary building energy challenge for commercial buildings not covered by a building benchmarking requirement.

Action 4.1.4 – Implement a time-of-listing/sale/rent labeling program for residential real estate listings and rentals.

Action 4.1.5 – Adopt a residential post-sale energy audit program.

Strategy 4.2 – Implement a performance requirement for existing buildings.

Action 4.2.1 – Develop a County-provided best practices list for high-performance energy conservation measures in existing buildings.

Action 4.2.2 – Adopt minimum energy efficiency standards for buildings and rental units; develop a path to bring existing buildings up to current building code.

Action 4.2.3 – Adopt a building energy performance standard/audit/retrocommissioning requirement for existing commercial and residential construction.

Strategy 4.3 – Adopt a path to net-zero energy/carbon building code for existing commercial and residential buildings.

Action 4.3.1 – Implement an incentive program to encourage net-zero retrofits.

Action 4.3.2 – Establish a 2030 District in Montgomery County.

Action 4.3.3 – Explore requirements for extensively modified existing buildings to incorporate net-zero elements or achieve a high-performance certification.

Strategy 4.4 – Adopt a path to electrification in existing buildings.

Action 4.4.1 – Develop incentives for electrification; investigate and limit counter-productive incentives (e.g., incentives for natural gas).

Action 4.4.2 – Evaluate fuel-switching from natural gas to biogas.

Action 4.4.3 – Adopt a path to ban natural gas in existing buildings; evaluate fuel-switching from natural gas to biogas in buildings that cannot eliminate natural gas use.

Action 4.4.4 – Evaluate emergency back-up generator fuel sources and strategies to convert to bio/renewable sources.

Strategy 4.5 – Reduce building heat transfer.

Action 4.5.1 – Develop guidance and/or requirement for improved solar thermal performance.

Action 4.5.2 – Require a percent of the site to have a green cover requirement to help cool and insulate building/site while providing habitat value.

Action 4.5.3 - Require new and existing commercial and residential roofs to be either: green roofs (with soil depth deep enough for native plants/vegetables) or energy generation (solar). If for some reason, both options are impossible, use a cool roof (albedo).

Action 4.5.4 – Require and/or incentivize tree planting strategies (Evergreen on Western side and deciduous trees along south/eastern side of the lot; number of trees per lot size).

Goal 5 – Improve water conservation and efficiency in buildings (energy-water nexus)

Strategy 5.1 – Implement water efficiency requirements for new buildings.

Strategy 5.2 – Develop water efficiency incentives for existing buildings.

Strategy 5.3 – Modify building code to allow greywater re-use in buildings.

Carbon Sequestration Workgroup:

Goal 1: Strengthen land use policies to provide a foundation for maximizing carbon sequestration and increasing resilience

Strategy 1.1 - Set a minimum overall sequestration target as a percent of county emissions

Strategy 1.2 - Incorporate sequestration and adaptation considerations into county land use priorities.

Action 1.2.1 – Conduct a review of public and private lands to identify specific locations where increased investment and/or changed priorities are needed to maximize carbon sequestration on all land types: agricultural lands, natural forests, wetlands, urban and suburban landscapes, and all kinds of public and private properties (schools, recreational facilities, shopping centers etc)

Action 1.2.2 – Map overlay of the implications of Climate Workgroup recommendations for comparison with ongoing county programs to pinpoint both low-hanging fruit as well as areas that need resolution between conflicting goals

a. Assess carbon sequestration values of existing natural vegetation as well as opportunities for ecosystem restoration that have the maximum potential for increased sequestration and co-benefits for climate adaptation. This would build on existing data and assessments and established tools for estimating carbon stock in natural vegetation Comments: Tree Canopy Study 2011, Tree carbon study just published 2019, Sierra Club Forests and water Study 2018, and tools like iTree and COMET)

Action 1.2.3 - Create Carbon Sequestration Zones and use these also for education purposes, by showcasing how sequestration works and the multiple benefits it achieves. These may be in parks, schools, campuses etc. Others may be more ambitious "Zoning" for maximizing sequestration practices particularly responsive to the natural conditions of the site, and for benefits such as sourcewater protection

Action 1.2.4 - Review the county's land use planning processes and zoning regulations to identify those provisions that either encourage or discourage reforestation and forest and wetland preservation. This review should be the basis for expanding the positives and amending or eliminating the negatives, in terms of climate protection

Strategy 1.3 - Identify and adopt policies needed to enable or incentivize sequestration in targeted areas

Action 1.3.1 - Potential for carbon sequestration where it has co-benefits for adaptation should be among the key criteria for making land use policy decisions. This is where the Montgomery County government has the greatest authority with respect to addressing climate change

Action 1.3.2 - Cancel the proposed M-83 highway which threatens 73 acres of floodplain forests and wetlands in Germantown, Clarksburg and Gaithersburg, would worsen flood hazards in Montgomery Village, increase greenhouse gas emissions from transportation, and enable further development of rural and forested areas in areas that are now hotspots of deforestation in the County

Action 1.3.3 - Prioritize protection of watersheds rated high to excellent, which have low impervious cover and high value for drinking water quality and conservation of biodiversity, such as Ten Mile Creek with a protection overlay that limits impervious surfaces at the sub-watershed scale, consistent with the Master Plan, and prohibiting waivers for exceeding these limitations. Consider also establishing a forest reserve in such high-quality watersheds outside the Agricultural Reserve

Action 1.3.4 - Areas that could have great potential for added sequestration include land along highways, school lawns not used for athletic purposes, and lawns on very large residential lots

Action 1.3.5 - Encourage meadows in the place of large lawns

Action 1.3.6 - Consider changes that may be needed in policies pertaining to HOA governance to enable increases in carbon sequestration in residential areas

Action 1.3.7 - Establish a landscape certification program for carbon sequestration (similar to LEED for buildings), based on measurable standards and require this certification for new development

Action 1.3.8 - Revise and expand floodplain boundaries and buffer areas in light of changes in the water cycle associated with climate change

Action 1.3.9 - Use green infrastructure practices that sequester carbon as the default practice for stormwater management in upland areas. Establish stringent criteria for the approval of alternative structural practices and provide public notification with an opportunity for public comment

Strategy 1.4 - Strengthen protection of the Agricultural Reserve and rural low-density buffer areas which provide multiple benefits that are critical to the County's emissions, sequestration and resilience goals

Action 1.4.1 - Reinforce existing policies, zoning laws and other measures to avoid additional conversion of agricultural land to residential or commercial development in the Reserve and maintain agriculture as the preferred land use

Action 1.4.2 - Prevent sprawl of both roads and sewer infrastructure that enable higher density development in rural low-density areas outside the Reserve

Strategy 1.5 - Establish carbon sequestration zones in water source areas, as the first barrier in the multiple barrier approach to water quality protection

Action 1.5.1 - Increase public awareness that part of the justification for the Agricultural Reserve and Rural Low-Density zoning was that they are public water supply areas

Action 1.5.2 - Educate the public about the "multiple barrier" approach to protecting the public water supply, the value of forests and other carbon sequestration practices as part of the this approach to protecting public water supplies, and implications of land use for water treatment costs

Goal 2: Accelerate the implementation of carbon sequestration strategies using nature-based climate solutions across all County programs and policies

Strategy 2.1 - Create a Climate Change Emergency Office directly under the County Executive with the mandate to integrate sequestration using natural climate solutions with all departments, programs, stakeholders and coordination with state, other counties, etc

Strategy 2.2 - Hold orientation sessions among County departments and key stakeholders to review the outputs from the Climate Action Plan workgroups - building engagement

Strategy 2.3 - Review and implement all recommendations from the 2018 Climate Mobilization Report, particularly programs and incentives highlighted for agriculture, food waste management, and composting

Strategy 2.4 - Evaluate and rank high, medium, low priority existing county programs and potential new efforts proposed by the Workgroups for reducing emissions both rapidly and through sustained longer-term reduction strategies

Strategy 2.5 - Thrive Montgomery 2050: Coordinate with the Montgomery County Planning Department to ensure all the high priority recommendations of the Climate Plan are included in the update of the General Plan-2050

Action 2.5.1 - Current status of the issues identified by the Planning Department need to be reviewed and analyzed to identify which issues and potential policy recommendations are similar and support the priority ones in the Climate Plan and identify any areas that need to be addressed such as carbon sequestration and adaptation related to establishing a planning foundation for the county for 2050

Strategy 2.6 - Execute Climate Plan recommendations and programs in cooperation with regional plans and programs

Action 2.6.1 - Review Climate Plan recommendations with Washington Council of Governments' (MWCOG) and surrounding counties to identify and ensure collaboration and opportunities to maximize cooperation for achieving mutually beneficial goals

Strategy 2.7 - Identify and review existing reports and programs to maximize current programs and identify the need for new programs, staff, and authorities to achieve goals

Action 2.7.1 - For review of existing reports refer to the document in the Resources section: "MC Government Reports Related to GHG emissions."

Action 2.7.2 - Survey county agencies and divisions to identify and establish county programs that impact (increase and decrease) greenhouse gas emissions and additional authorities that may be needed to support programs that decrease them

Action 2.7.3 - Evaluate and rank high, medium, low priority programs to expand and modify to increase reductions and recommend additional programs to reduce emissions both rapidly and through sustained longer-term reduction strategies

Goal 3: Move from silos to systems change - taking a "whole systems" approach that enables innovation to increase carbon sequestration in ways that maximize co-benefits for adaptation

Strategy 3.1 - Leverage complementary funding sources for water quality protection practices that also sequester carbon

Action 3.1.1 - Prioritize and maximize the use of natural or green infrastructure practices for achieving compliance with the County MS4 or Stormwater Permit by developing standard practices for assessment and comparison of green and gray infrastructure options for all stormwater management projects

Action 3.1.2 - Proactively identify opportunities for natural green infrastructure projects and conduct a place-based participatory assessment so that these are “investment ready” and windows of opportunity can be acted upon

Action 3.1.3 - Revise County Codes to eliminate the granting of waivers on stormwater requirements for new development or make fees-in-lieu commensurate with the cost of managing stormwater runoff with green infrastructure practices that sequester carbon

Action 3.1.4 - Build on the existing Rainscapes program which promotes and provides technical assistance and financial incentives for conservation landscaping that reduces stormwater runoff, to also maximize carbon sequestration

Action 3.1.5 - Establish a baseline of existing forest cover that can be used to demonstrate forest conservation is additional so that it can be credited for water quality protection purposes (under anticipated new provision in MDE MS4 draft Accounting Guidance document)

Action 3.1.6 - Delineate sourcewater areas and prioritize these areas for conservation easements that can also receive credit for water quality protection (under an expected new provision in new MDE MS4 draft Accounting Guidance document)

Action 3.1.7 - Establish a Retention Credit Trading program (similar to that in DC) which enables third party project developers to achieve economies of scale by engaging multiple landowners and achieving economies of scale in landscape restoration activities that have both water quality and carbon sequestration benefits

Strategy 3.2 - Develop creative financing for nature-based solutions in Montgomery County

Action 3.2.1 - Work with the Montgomery County Green Bank to incorporate financing and revolving loan funds for reforestation, silviculture and regenerative agriculture programs where appropriate

Action 3.2.2 - Invest in making the case for the effectiveness and potential cost-savings associated with nature-based solutions and market these projects to impact investors in the state, working in partnership with foundations and high wealth donors

Action 3.2.3 - Encourage the Montgomery County Economic Development Corporation to engage with investors from outside the County that are interested in investing in carbon sequestration projects

Action 3.2.4 - Leverage the county's considerable political clout by advocating for financing from Congress for cities and counties to maximize nature-based solutions

Action 3.2.5 - Learn, innovate, and scale approaches that drive finance and other incentives to landowners and farmers. In particular, review how the county applies the property tax to different land uses agricultural land and how it could be modified to encourage sequestration as well as changes in land use that reduce net emissions

Action 3.2.6 - Undertake a review of/ build learning partnerships with states/ counties that are piloting and scaling such programs. Examples are Boulder County, Colorado and the many experiments with NORI, blockchain and more

Strategy 3.3 - Maximize the engagement of young people in all we do by partnering with Montgomery College, MCPS, and other educational and youth-based programs (e.g. 4H) to develop education, training, and work experience opportunities grounded in nature-based sequestration systems

Action 3.3.1 - Provide reforestation and compost job training and placement programs

Action 3.3.2 - Partner with State and Congressional delegates to seek funding for a statewide youth Climate Conservation Corps as a possible pilot for the nation - to assist with urban garden development, urban tree planting, and restoration projects that can help sequester carbon. Employ youth in summer jobs, focusing on disadvantaged and low-income youth as a priority

Strategy 3.4 - Implement workforce development, re-entry and job training programs, job opportunities and entrepreneurial training and support with a special focus on providing these opportunities to underserved communities

Strategy 3.5 - Launch a far-reaching education and engagement campaign to the general public and to every sector in the county on why, how and what they can do to sequester carbon to mitigate climate change

Strategy 3.6 - Leadership by example: Explore joining bold new platforms

Strategy 3.7 - Launch a public education and engagement campaign throughout the county to educate about the benefits of and encourage plant-based diets

Action 3.7.1 - Encourage the consumption of a plant-based diet with foods from farmers that use regenerative agricultural practices

Action 3.7.2 - Review "consumption-based," carbon-based emissions assessments and programs such as those instituted in Portland, San Francisco, Seattle, Vancouver, London that include plant-based diet and menu programs

Action 3.7.3 - Expand existing county-based programs such as MCPS meatless offering and "Live Well" initiatives

Action 3.7.4 - Partner with existing local and national programs to utilize best practices for plant based education and behavior change programs such as those provided in the World Resources Institute *"Playbook for Guiding Diners Towards Plant- Rich Dishes in Food Service"*; and the National Resources Defense Council Climate-Friendly Menus program which offers fact sheets and strategies on increasing plant based diets

Action 3.7.5 - Encourage the "less meat, better meat" approach to eating animal foods by educating county residents on the harmful impacts of confined animal feedlot operations (CAFOs). Share cost-saving strategies to support residents, restaurants and institutions in making this transition

Strategy 3.8 - Analyze every sector of our food system to identify their impacts on climate change and opportunities for solutions that also increase food security

Action 3.8.1 - Review programs and policies being implemented in other regions to determine which successful programs to adopt and create new programs and policies where they don't exist

Action 3.8.2 - Prioritize and implement those programs and policies with the highest impact on sequestering carbon, reducing greenhouse gas emissions and providing other co-benefits to communities

Action 3.8.3 - Reduce food and paper waste and excess

Action 3.8.4 - Increase recycling of paper and other wood products

Action 3.8.5 - Provide incentives for farmers to increase forest land and food forests (agroforestry) on their properties. Create opportunities for them to harvest and sell the wood and other "products" from these forests to surrounding residents

Action 3.8.6 - Support construction of affordable housing and commercial and municipal buildings with sustainably-harvested wood—replacing carbon-intensive concrete and steel

Goal 4: Increase protections for existing trees and double the tree canopy in the urban, suburban, and other non-forest areas of Montgomery County, leading to a net increase in the amount of carbon sequestered in trees to 2030 and beyond

Strategy 4.1 - Ensure that goals for increasing trees are considered during all planning, zoning, and permitting processes

Strategy 4.2 - Require commercial land developments to have a net zero carbon emissions or a positive sequestration value and address climate change risks such as flood mitigation, and shade for residential and commercial buildings

Action 4.2.1 - The County Council should establish a zero emissions policy

Action 4.2.2 - The Planning Commission should develop specific guidelines for natural carbon assessments using reputable calculators such as iTree and COMET that can be combined with building, transport and energy guidelines

Strategy 4.5 - Update and consolidate the County's many tree planting programs into an easy "one stop shopping" web portal for the public

Strategy 4.6 - Launch an aggressive tree planting initiative for areas of high priority on both public and private land

Action 4.6.1 - Develop explicit place-based map for tree planting campaign utilizing recent 2018 and 2019 analyses and an update of the 2011 Tree Canopy study

Action 4.6.2 - Mapped priorities for species and locations should explicitly reflect climate change considerations and provide opportunities for active community engagement. Upper watershed areas of the County would be one of the priority areas

Strategy 4.7 - Prioritize mature trees and street tree planting and maintenance. Allow some revenues from developer fees to be used by the Transportation Department for stump removal and replanting on street right-of-ways

Action 4.7.1 - Create stricter prohibitions against cutting of mature trees, forests, and/or increased penalties for illegal cutting of natural vegetation

Action 4.7.2 - Increase investment in tree maintenance and health throughout the County

Strategy 4.8 - Document and promote doubling by 2035 of "micro-forests" or urban forests on both public and private lands

Action 4.8.1 - Devise a detailed definition and County strategy for promoting micro-forests and urban forests, which are natural and planted woody vegetation that grow in and around human settlements

Action 4.8.2 - New incentives are developed to retain and expand vegetation areas on private land, with particular emphasis on increasing local benefit such as edible native species, nectar for honeybees, etc

Action 4.8.3 - Expand the Rainscapes and associated programs at the Department of Environmental Protection to include micro forests

Action 4.8.4 - Action plan is formulated for expanding urban forests on public land such as schools, parks, etc

Strategy 4.9 - Provide substantial tax benefits for tree planting by private landowners, with increasing per-acre rates over time as forests grow up and increase their carbon stock, and as land values for other uses in the county increase

Action 4.9.1 - Explore tax incentive options such as the local property tax, but other options should be explored as well. The value of the benefit and its rate of increase need to be high enough to incentivize both the preservation of currently existing trees and forests, and a substantial amount of reforestation. Consider incentives that encourage food production, e.g., walnuts, hazelnuts,etc., and perennial berries (elderberries, raspberries, etc.) to help with developing local food resilience

Action 4.9.2 - Establish voluntary sequestration certification program that landscapers can apply to get certification based on knowledge and use of good "carbon farming" practices

Action 4.9.3 - Create neighborhood champions program - perhaps small grant program to encourage residents to plant trees or carry out other sequestration activities

Action 4.9.4 - Development of subsidy for insurance for tree damage to encourage maintaining trees in residential areas - tied with tree safety information to prevent unsafe trees

Action 4.9.5 - Increase services and subsidies for maintaining tree health including support for NGO initiatives by Conservation Montgomery and others

Action 4.9.6 - Development of an urban suburban extension program to provide guidance on good practices for carbon sequestration, combined with a stepped up education effort regarding trees, their carbon value and their co-benefits

Strategy 4.10 - Improve soil health around trees with compost and biochar

Action 4.10.1 - Produce biochar from downed trees for use in improving soil health. including building a county facility for conversion of trees to bio-char (could be combined with facility to convert ag residue

Strategy 4.11 - "Mulch Correctly Campaign" to eliminate mulch mounds in the county infrastructure, working with landscaping companies

Action 4.11.1 - Break down mulch mounds, spread the mulch correctly, leave simple (funny?) signage explaining how mulch mounds kill trees

Goal 5: Establish a strict policy of no further loss of the County's natural wetlands, and expand wetlands where possible

Strategy 5.1 - Stricter protection of wetlands in the County should limit interventions that impact existing wetlands to those needed to control infestations of invasive species such as purple loosestrife and Phragmites

Strategy 5.2 - County and WSSC increase efforts to protect and expand wetland and riparian ecosystems

> Action 5.2.1 - An agreement with WSSC to ensure protection, restoration and expansion of wetlands and riparian forests are given highest priority for upper watersheds under their protection

Strategy 5.3 - Vernal pools within the county are mapped, monitored and on public lands, given protection against destruction

Strategy 5.4 - Assessment of feasibility of reintroduction of beavers into some areas within critical watersheds to naturally expand wetlands and manage stormwater

Strategy 5.5 - Conduct an assessment of whether a goal of 10% wetlands across the county by 2050 is desirable and/or feasible

Goal 6: Increase the County's forest area to 37% in 2027 and 45% in 2035 (as compared to 34% in 2001-2016)

Strategy 6.1 - The County increases its proactive management of natural areas (resources and staff) to reduce degradation from invasive species, overgrazing by deer, and climate related risks such as fire and drought, as well as encroachment by land development along the periphery of forests

> Action 6.1.1 - This also entails changing the traditional focus of parkland establishment in the county, which has emphasized stream valleys, to one that includes uplands on an equal basis, including for the forest conservation easement program

> Action 6.1.2 - Establish a long-term plan to restore forests and wetlands by 2035 on all county parks and lands not required for other uses (e.g. sports fields, visitor centers). The restoration should be either to forests or to wetlands (which are by far the two main kinds of natural vegetation in the county), according to the characteristics of the site

Strategy 6.2 - Existing forests and wetlands are given a score reflecting their overall ecological condition to guide investments in assisted natural regeneration, restoration and management

> Action 6.2.1 - Use the county's excellent GIS data system to identify locations where natural regeneration of forests is likely to succeed, without the need for tree planting. Examples of such locations include those close to large parcels of forest and those bordered by tall trees of reproductive size (generally 12" DBH or more) along field edges

> Action 6.2.2 - Tree species selection for reforestation should anticipate extreme climate events such as drought, flooding, heat waves, etc. and assisted natural regeneration should be the strategy of choice wherever possible

Action 6.2.3 - Share information with landowners, accompanied by information on the county's Forest Conservation Act and other incentives for reforestation

Strategy 6.3 - Reforest, through both tree-planting (where necessary) and natural regeneration (where possible), large blocks of forest on County-owned land using native tree species

Action 6.3.1 - Explore partnerships with NGOs and private sector to accomplish reforestation goals

Action 6.3.2 - Areas prioritized for reforestation should include county lands that are currently leased for cropping (especially those with high-emissions cropping systems such as annual row crops -- e.g. corn, soy and wheat) and those that are mowed simply for visual purposes. Sports fields and other high-density recreational areas would be excluded

Strategy 6.4 - Develop broader landscape strategies by working with other public land-managing agencies in the county and in adjacent counties to coordinate ecosystem restoration plans on watershed and county-wide levels, as well as plans to share the costs involved

Action 6.4.1 - Coordinate with National Park Service, Maryland State Parks and Wildlife Management Areas, NIH, the Department of Defense, WSSC, and others

Strategy 6.5 - Revise forest policies to incorporate explicit sequestration objectives such as stricter prohibitions against cutting of mature trees, forests, and/or increased penalties for illegal cutting of natural vegetation

Action 6.5.1 - Amend the county's Forest Conservation Act (FCA) which requires developers to either preserve forest or pay to protect or establish substitute forests elsewhere, so as to strengthen the incentives for both preservation and reforestation. Currently the FCA requires either protection of substitute forests on a 2 acres for 1 acre lost basis, or reforestation on a 1 for 1 basis. These should be increased to 4 to 1 for protection and 2 to 1 for reforestation

Strategy 6.6 - Hold field days, site visits, seminars and other events at sites that have successfully been reforested in Montgomery County

Goal 7: Engage and support farmers, gardeners and their organizations in an aggressive transition to regenerative agricultural practices

Strategy 7.1 - Identify, incentivize, and promote the most promising practices in regenerative agriculture for sequestering carbon and for reducing or eliminating greenhouse gas emissions – set specific targets after getting baseline soil carbon data, i.e. quadruple County acres in regenerative agriculture / increase agricultural sequestration by 15% by 2027

Action 7.1.1 - Implement a robust process to identify, incentivize, promote and evaluate the most promising practices in regenerative agriculture from the "Menu of Recommended Practices for Carbon Sequestration in Agriculture" by the Maryland Department of Agriculture and implement these practices for each commodity. Utilize the

COMET Planner to identify those practices which sequester the most carbon. Go beyond these conventional conservation agriculture practices to incorporate newer science-based practices such as promoting perennial grains, diversified farming systems, and multi-tiered farming incorporating crops, trees, and farm animals

Action 7.1.2 - Encourage farmers to shift to lower-emissions cropping and livestock systems. These systems should be based on assessment of the emissions and sequestration rates of the whole system and all GHGs, not just a single component (e.g. soil carbon) Examples of lower-emission systems include perennial crops (compared to annual row crops such as corn, soy and wheat), and non-ruminant livestock, in addition to silvopastoral systems

Action 7.1.3 - Encourage farmers to shift to silvopastoral systems and increase the use of tree crops and trees for wind- breaks and water protection. Increase incentives and support for farmer-to-farmer programs that sequester carbon and benefit farmers including silvopastoral systems, tree crops and wind breaks, trees in pasture and lawns. This includes expanding existing programs in the Agricultural Reserve such as Re-Leaf the Reserve program

Action 7.1.4 - Promote investment and support to carbon farming in other contexts (but NOT as a County offset, rather as a moral public commitment). E.g., Montgomery County partners / twins with another county outside of our region or with a community in a developing country abroad to support carbon farming, tree planting or reforestation programs (providing the additional incentive of an even more meaningful public engagement connection for County residents)

Strategy 7.2 - Prioritize education of farmers by technical assistance providers to assist producers in implementing regenerative agricultural practices, including composting, silviculture, and diversified farming systems.

Strategy 7.3 - Build multi-stakeholder partnerships, i.e. with the Million Acre Challenge, Chesapeake Bay Funders, to accelerate progress and learning in regenerative agriculture

Action 7.3.1 - Bring together Montgomery County farmers, organizations, local and national leaders in regenerative agriculture, programs, academic researchers, funders and investors

Action 7.3.2 - Partner with philanthropic foundations and existing learning platforms like the Soil Health Academy to create more opportunities for farmers and gardeners to learn about innovations at smaller scales

Action 7.3.3 - Connect with the county and state to ensure integration of all these goals into the training of those working with the SCD and Extension services in MoCo

Action 7.3.4 - Connect now with bold initiatives such as the launching regional Million Acres Challenge for regenerative agriculture (Future Harvest)

Action 7.3.5 - Develop outreach programs to communicate the agronomic and economic benefits of using these practices including: increased soil health; reduced flooding during flooding rains from improved water infiltration throughout the soil; increased soil water retention during periods of drought; better crop growth with fewer inputs; economic benefits of cover crops; fuel, time and maintenance savings from using no-till farming; improved nutritional value of food grown in healthy soils

Action 7.3.6 - Recruit farmers who want to try these (or who are already doing them) to demonstrate them on their farms, and through Extension or Soil Conservation Districts), hold field days to show other farmers how they work (peer-to-peer education)

Action 7.3.7 - Engage with local science institutions to support analysis of carbon sequestration projects in partnership with farmers

Action 7.3.8 - Promote the benefits of carbon farming and soil health by integrating information and encouraging carbon farming practices through Master Gardeners and Koiner Center for Urban Farming and the MCPS curriculum

Strategy 7.4 - Develop market opportunities for products grown and produced using regenerative agricultural practices

Action 7.4.1 - Maintain and expand permanent local farmer-producer markets throughout the county especially for farmers who use regenerative agricultural practices that support the sequestration strategy

Action 7.4.2 - Create a recognition program, including an annual awards program with widespread publicity, that acknowledges and rewards Montgomery County farmers who are already using regenerative agricultural practices, for their leadership in solving our climate crisis

Action 7.4.3 - Explore innovative practices that could be incentivized and piloted by existing and new farmer leaders in the county

a. Review incentive programs established in California, Colorado and other states and regions to identify optimal programs to replicate
b. Prioritize funding for evaluated and prioritized practices by estimating potential for sequestration, GHG reduction and other linked co-benefits. Evaluation could include:
    a. How much each practice increases sequestration and reduces GHG (see menu of practices or COMET-Planner)
    b. Number of new acres on which each carbon-sequestering practice can be adopted
    c. Adding woody plants gives most GHG reduction per acre, so encourage silvipasture, more tree planting on marginal cropland, riparian buffers on every stream

c. Consider incentives such as farmers in the Agricultural Reserve get .5 percent off annual property tax for achieving specific benchmarks in regenerative agriculture and carbon sequestration

Action 7.4.4 - Consider engaging farmers in getting certified by an independent third-party organization to demonstrate to residents that they use regenerative agricultural practices on their farms to produce their food. Review the various food and farm certification programs to determine which certifications are robust enough to verify that the farmer is using regenerative agricultural practices If the existing certification programs are not robust enough, then create a "carbon-sequestered" or regenerative agriculture certification program with a label that farmers can use to promote their products and their farm when they meet a set of criteria indicating their use and/or outcomes of regenerative agricultural practices

Action 7.4.5 - Explore new ways to build markets in support of carbon sequestration through agriculture land-use practices

a. County government and Montgomery County Public Schools buying food produced by local farmers using regenerative agricultural practices
b. Encourage substitution of concrete with laminated wood (utilizing sustainable forestry practices to avoid excessive tree harvesting)
c. Coppice for root-intensive lumber material, coppice and pollard for leaf-hay/tree-hay

Action 7.4.6 - Assess policies (such as purchasing/ procurement policies of the county, building standards, etc.) for opportunities to increase demand (e.g. mandate a % of procurement of local regeneratively produced food)

Action 7.4.7 - Consider working with the Good Food Purchasing Campaign to maximize procurement by schools, prisons, government agencies of foods produced from regenerative producers

Action 7.4.8 - Explore creating a local label or certification for farmers and producers using regenerative practices, or alternatively adopting a small percentage of county procurement for farms using an organic regenerative label

Strategy 7.5 - Launch a public education and engagement campaign throughout the county to increase the consumption and production of food using regenerative agricultural practices

Action 7.5.1 - Launch a campaign to encourage the consumption of a plant-based diet with foods from farmers that use regenerative agricultural practices

a. Review "consumption-based," carbon-based emissions assessments and programs such as those instituted in Portland, San Francisco, Seattle, Vancouver, London that include plant-based diet and menu programs
b. Expand existing county-based programs such as MCPS meatless offering and "Live Well" initiatives

c. Partner with existing local and national programs to utilize best practices for plant based education and behavior change programs such as those provided in the World Resources Institute *"Playbook for Guiding Diners Towards Plant- Rich Dishes in Food Service"*; and the National Resources Defense Council Climate-Friendly Menus program which offers fact sheets and strategies on increasing plant based diets.
d. Encourage the "less meat, better meat" approach to eating animal foods by educating county residents on the harmful impacts of confined animal feedlot operations (CAFOs) and the climate sequestration benefits, as well as health and other environmental benefits of grass-fed and pasture-raised animal production practices. Share cost-saving strategies to support residents, restaurants and institutions in making this transition
e. Educate the public about food labeling and certifications that incorporate regenerative agricultural practices

Action 7.5.2 - Launch an urban/suburban backyard and front yard carbon farming / gardening campaign

a. Launch this campaign as part of a broader, county-wide "climate-friendly landscape" program for residential and commercial landowners, promoting reduced lawn-based landscapes and encourage the planting of native trees, shrubs, and perennials and creation of food, pollinator and rain gardens, leading to multiple co-benefits
b. Promote and engage participation through the county's existing programs including Rainscapes, tree-planting, etc
c. Create a campaign approach to enlist community action e.g. challenge neighborhoods to form carbon farming groups that can attract support and incentives, modeling change in their community
d. Develop an Urban Extension Service (perhaps an out-growth of the Rainscapes program) which enlists the support of key stakeholders such as landscaping companies and Master Gardeners
e. Partner with local organizations and local chapters of national organizations to explore opportunities for integrating this campaign into their existing educational and engagement programs. Promote the many benefits of regenerative agriculture including carbon sequestration, along with other co-benefits including increased climate resilience and adaptation, improved human health and animal health, a healthier environment, and more. Potential organizations to partner with include the YMCA, 4-H
f. Create a campaign approach to enlist community action e.g. challenge neighborhoods to form carbon farming groups that can attract support and incentives, modeling change in their community. e.g. provide tax incentives such as property tax breaks for urban carbon farming
    a. Informational resources:
    b. Urban Drawdown Initiative: Boulder and San Francisco examples

c. Carbon Capture Gardens on The Nature of Cities
d. How to turn your backyard into a carbon sink
e. Climate wise landscaping
f. Capturing carbon in urban soils: What's possible?

Goal 8: Help restore the earth's carbon, water and energy cycles as a key climate mitigation and adaptation solution by restoring Montgomery County's soil fertility, microbial activity, and moisture-holding capacity.

Strategy 8.1 - Establish and implement programs, policies, incentives and investment of resources (i.e. farmer technical assistance, MC procurement contracts, transition financing, etc.) to build healthy soils in the Agricultural Reserve and throughout the entire county.

Action 8.1.1 - Increase incentives and support for farmer-to-farmer programs that sequester carbon and benefit farmers such as healthy soil practices (MDA recommended), regenerative agriculture and permaculture by providing educational programs, teaching farms, tax incentives, equipment sharing or co-ops, and opportunities for information sharing

Action 8.1.2 - Help farmers gain access to specialized equipment needed to allow cover crops to be planted earlier, before corn or soybeans are harvested (Interseeders, Highboys), and also equipment to terminate cover crops without herbicides (roller-crimpers)

Strategy 8.2 - Establish a County Carbon Sequestration Task Force or Advisory Committee including local scientists, land stewards, and sequestration experts to advise and monitor a county healthy soils program.

Action 8.2.1 - Use County models that exist for Task Force/Advisory Committees and other state models to establish the goals and responsibilities

Action 8.2.2 - Liaise with the Maryland Department of Agriculture and the Maryland Department of the Environment to coordinate with the state-level healthy soils programs and incentives (e.g., Delegate Dana Stein)

Strategy 8.3 - Launch a healthy soils campaign to educate and engage the public, local officials, and business owners in Montgomery County to build and maintain healthy soils in residential, school, commercial and community landscapes. Provide incentives and education about how to convert lawns and turf into a variety of other landscapes that sequester carbon more effectively and provide multiple other co-benefits for pollinators, biodiversity, storm water management, water quality, food security, and resilience.

Action 8.3.1 - Educate and engage residents, businesses, the education sector, institutions, government agencies and landscape companies in the multiple co-benefits of building and maintaining healthy soil in their landscapes

Action 8.3.2 - Provide training in optimal methods for building and maintaining healthy soil and for optimal care of their landscape including lawn, trees, food gardens, pollinator gardens, rain gardens, flower gardens, food forests / agroforestry and forests

Action 8.3.3 - Work with Schools to pilot / demonstrate landscaping practices including family learning opportunities to help students bring the lessons home

Action 8.3.4 - Coordinate/consolidate county programs relevant to residential and commercial properties into a broader "climate-friendly landscape" program

Strategy 8.4 - Practices for ecosystem rehabilitation to restore soil health and increase ecosystem resilience

Action 8.4.1 - Combine tree and other plantings with compost amendments to degraded soils

Action 8.4.2 - Mimic natural succession processes when rehabilitating urban forested areas

Action 8.4.3 - Promote the local production and use of compost tea and promote the education and use of vemicomposting/worm composting and the use of worm castings

Strategy 8.5 - Establish incentives for increasing healthy soil to sequester carbon

Action 8.5.1 - Establish a small grant program for residents to encourage residents to build and maintain healthy soils in their yards and in their neighborhoods

Action 8.5.2 - Engage local businesses including home improvement companies, nurseries, landscape companies and local hardware stores in becoming business sponsors to provide residents with supplies at discounted prices

Action 8.5.3 - Create a neighborhood champions program to increase the number of participating residents and neighborhoods and to support the development of leading demonstration sites in each neighborhood

Action 8.5.4 - Establish a voluntary sequestration certification that landscape companies can apply for after participating in a rigorous training program and demonstrating their implementation of best practices in building healthy soils

Action 8.5.5 - Create a reward and recognition program for community members who implement significant carbon sequestration on their property

Strategy 8.6 - Launch a campaign to convert lawns into a variety of other landscapes that sequester carbon more effectively and provide multiple other co-benefits to our food system, our health, our environment, stormwater management and strengthening climate resilience

Action 8.6.1 - Encourage conversion of lawns to meadows, food gardens, food forests, pollinator gardens, rain gardens and forests

Action 8.6.2 - Incentivize rebuilding of healthy soils in the Montgomery County Agricultural Reserve using tradable development rights, and in the Stream Valley Park System

Action 8.6.3 - Update the practices, policies and training for management of public lands to incorporate best practices that optimize healthy soil as the new normal

Strategy 8.7 - Create and adopt legislation that establishes support for a county-wide healthy soils program

Action 8.7.1 - Review the Maryland Healthy Soils Incentive Program

Action 8.7.2 - Review legislation passed and proposed in other states and counties to increase healthy soils

Action 8.7.3 - Collaborate with our region's new Healthy Soils Advisory Council, the Million Acre Challenge and other key partners during this process

Action 8.7.4 - Create and adopt legislation to establish and implement a healthy soils program in the county

Strategy 8.8 - The state Nutrient Management law needs to be reviewed to address the use of compost for lawn care

Action 8.8.1 - Review and assess Maryland's Chapter 10 Fertilizer Application Requirements for Land Not Used for Agricultural Purposes and assess the definitions of "natural organic fertilizer" and "organic fertilizer" in relation to the inclusion of compost

Action 8.8.2 - Assess the definitions in the Nutrient Management Law (see page 7 @ §8–803.4(g) and establish recommendations on to address the broad restrictions for using compost in order to expand the use

Goal 9: Close the loop by establishing a county-wide food and other organic waste composting system for government, commercial and residential buildings to reach a minimum of 70% diversion, and increase the use of compost for improving soil health and increasing carbon sequestration

Strategy 9.1 - Establish a County-wide composting system, ensuring a supply of quality organic soil amendment/ compost to farms and gardens

Action 9.1.1 - Mimic what is in place in San Francisco and work closely with the Urban Sustainability Directors Network since MOCO is already a member. Maximize job creation and quantify reduction of methane as a result

Action 9.1.2 - Maintain woodchip stocked composting stations that residents can easily access drop off certain waste product to. Landscapers may dump woodchips at the monitored compost station for a comparatively reduced tipping fee (<60 per load), or otherwise creatively compensated for the contribution. As these stations will increasingly

use hauling services -better to create Parks capacity for their own motorless cargo-bicycle or draft horse neighborhood scale pick-up/drop-off loops

Strategy 9.2 - Expand County backyard composting program by allowing food scraps to be composted, providing rodent proof compost containers, and providing compost training based upon best practices and providing demonstration composting education hub sites. Include training on how to use compost and benefits such as building healthy soil and carbon sequestration

Action 9.2.1 - Amend County codes that restrict composting of food scraps on residential property

Action 9.2.2 - Bulk purchase or provide rebates for residents to obtain approved compost containers for food scraps

Action 9.2.3 - Adapt existing training program (from DC backyard composting program) and train-trainers (such as Master Gardeners and other volunteers) to provide trainings on best practices for composting of food scraps and compost use

Action 9.2.4 - Establish Composting Education Hubs throughout the County and include demonstration sites for residents to learn how to compost and how to use compost

Strategy 9.3 - Establish County Community Composting Hubs that utilize rodent proof containers, best practices throughout the county

Action 9.3.1 - Adapt the existing DC Community Composting Program to provide neighborhood based community composting

Action 9.3.2 - Provide Master Composter training programs and education about how to compost, compost use, and benefits of compost for healthy soil and carbon sequestration

Strategy 9.4 - Expand On-Farm Composting and Compost Use

Action 9.4.1 - Provide composting training for farmers

Action 9.4.2 - Assess and provide technical assistance to support farmers, such as equipment for composting

Action 9.4.3 - Increase compost use on farms

Action 9.4.4 - Review County and State legislation related to on-farm composting and identify amendment improvements to facilitate composting

Action 9.4.5 - Review and adopt best practices for carbon farming programs-consider incentives

Strategy 9.5 - Institute on-site composting programs throughout the county

Action 9.5.1 - Assess the potential for key institutions to establish on-site composting operations

Action 9.5.2 - Provide support for institutions to identify financial assistance to establish on-site composting operations

Strategy 9.6 - Institute composting program for commercial businesses

Action 9.6.1 - Provide toolkits and training for commercial businesses to establish composting programs based on best practices

Action 9.6.2 - Provide resources for collecting and transporting food scraps to composting facilities, ideally within the county

Strategy 9.7 - Institute composting program for multi-family residents

Action 9.7.1 - Provide toolkits and training for commercial businesses to establish composting programs based on best practices

Action 9.7.2 - Provide resources for collecting and transporting food scraps to composting facilities, ideally within the county

Strategy 9.8 - Institute composting program for single-family residents

Action 9.8.1 - Establish food scrap collection program based upon best practices

Action 9.8.2 - Provide educational materials and enact an outreach campaign to raise awareness and educate residents about the benefits of composting and compost use

Action 9.8.3 - Provide resources for transporting food scraps to composting facilities ideally within the county

Strategy 9.9 - Expand composting, compost use and education in schools

Action 9.9.1 - Provide toolkits for schools at all levels to establish composting both on-site and off-site

Action 9.9.2 - Provide toolkits for schools to use compost on the school grounds and for school gardens

Action 9.9.3 - Provide toolkits for schools to integrate curriculum modules on composting and compost use

Action 9.9.4 - Integrate composting and compost use into the SERT program

Action 9.9.5 - Address and provide facility staff with support to institute food scrap composting

Strategy 9.10 - Institute food scrap composting program at all farmers markets

Action 9.10.1 - Provide food scrap composting program collections and pick up and composting of food scraps at all farmers markets

Strategy 9.11 - Expand composting capacity within the county

Action 9.11.1 - Divert residential food scraps into backyard composting and community composting systems

Action 9.11.2 - Identify and establish mid-scale food scrap composting operations throughout the county/on county owned properties (to reduce transportation carbon emissions)

Action 9.11.3 - Establish on-site composting programs for institutions, schools, businesses

Action 9.11.4 - Stop incinerating food scraps and waste and divert food scraps and food waste from the county incinerator and compost the food scraps and food waste preferably in the county

Action 9.11.5 - Convert the Dickerson Yard Waste Composting facility to an operation that also composts food waste and scraps

Action 9.11.6 - Assess and implement necessary modifications to the Transfer Station Annex Building to accommodate receipt and transfer of food scraps for composting

Action 9.11.7 - Identify, establish and map carbon sources such as wood chips from landscaping services and "brown" organic materials and promote the use of them for composting food scraps and waste

Strategy 9.12 - Expand use of compost in the county and support and prioritize the use of "MoCo-locally made compost"

Action 9.12.1 - Create and implement a broad-based education and outreach program on the benefits of composting and compost use

Action 9.12.2 - Identify key areas for expanding the use of compost, such as mulching for landscaping and gardens

Action 9.12.3 - Institute a program to promote compost use for food production on private properties/lawns

Action 9.12.4 - Conduct a compost marketing study to identify the potential markets and sources of high-quality compost

Strategy 9.13 - Institute incentive and dis-incentive programs that promote composting and compost use

Action 9.13.1 - Institute a non-regressive "Save as You Throw" (Pay as You Throw) program (This strategy charges residents based on the amount of trash produced rather than via property taxes or fixed fees. Make sure the fee structure is not regressive, so as not to impact low-income residents disproportionally. Note: this was also a recommendation in the County Executive Transition Team Report https://www.montgomerycountymd.gov/OPI/Resources/Files/2019/MarcElrich_Transition_Team_Report.pdf

Action 9.13.2 - Establish differential tip fees to motivate generators to source-separate food scraps and other organics, and encourage collectors to provide recycling collection of such materials

Strategy 9.14 - Establish the carbon emissions sequestration values related to the recommendations provided in the Zero Waste Task Force Report

Action 9.14.1 - Estimate the comparison of carbon emissions reductions in relation to the high priority zero waste management strategies such as composting compared to incineration

Action 9.14.2 - Utilize carbon emissions sequestration estimates of potential strategies and methods to establish program priorities

Action 9.14.3 - Identify co-benefits of resource management methods, such as composting and compost use compared to incineration and landfill disposal of food scraps and waste

Strategy 9.15 - Expand the collection and redistribution of food that can be consumed

Action 9.15.1 - Identify and map all available food recovery opportunities and coordinate with food rescue stakeholders to facilitate the collection and food redistribution to food insecure populations

Action 9.15.2 - Establish barriers and solutions to food donations-such as providing education for food donors related to proper separation and storage. Other issues such as standardizing food labels need to be explored at the State level

Action 9.15.3 - Educate and facilitate the use of the tax incentive to increase the amount of food farmers donate to food rescue organizations

Strategy 9.16 - Update the county website to include more information and resources on how to compost, how to use compost, and benefits of composting

Action 9.16.1 - Expand the county website information on how to compost, how to use compost, benefits of composting and using compost, videos, and a library of additional resources

Strategy 9.17 - Support state level organics diversion, composting and compost use recommendations and legislation

Action 9.17.1 - Identify and implement recommendations in the report HB 171 that align with Climate Plan recommendations

Strategy 9.18 - Modify the County’s waste management plan. Eliminate incineration and put residuals in a safe and remote landfill, accessible by clean-energy rail haul. Give oversight of solid waste management to DEP (not a private entity with its own interests)

Strategy 9.19 - Ensure that the Solid Waste Advisory Committee is informed about all composting related recommendations and solicit support

Clean Energy Workgroup:

Goal 1 – Green the electricity supplied to Montgomery County residents and businesses.

Strategy 1.1 – Work to modify existing, or develop new, laws and policies at the State level to support greening of the electricity supply

Action 1.1.1 – Support an increase in the State's Renewable Portfolio Standard (RPS) to 100%

Action 1.1.2 – Support a modification/expansion of the requirements for Tier 1 renewable sources under the RPS to ensure the development of new, clean renewable generating capacity (e.g., solar and wind).

Action 1.1.3 – Support the authority of local jurisdictions to offer Community Choice Aggregation (CCA).

Action 1.1.4 – Support a carbon pricing mechanism at the State level.

Strategy 1.2 – Develop a Community Choice Energy (CCE) program (dependent on success of Action 1.1.3)

Goal 2 – Expand the use of distributed renewable energy.

Strategy 2.1 – Establish engagement strategies, programs, and financial tools to address cost barriers to onsite renewables and storage.

Action 2.1.1 – Examine the benefits of reinstituting County's property tax credit for solar and geothermal systems.

Action 2.1.2 – Analyze the need for warranty or insurance product that covers cost of roof and PV system maintenance with the Montgomery County Green Bank and other parties.

Action 2.1.3 – Identify barriers to use of distributed energy systems in low- and moderate-income households and ensure distributed energy programs and financial tools are accessible to all.

Action 2.1.4 – Evaluate financial incentives for clean energy storage.

Action 2.1.5 – Ensure programs like C-PACE and the Montgomery County Green Bank are supported to the fullest extent possible to maximize leveraging of private capital to support distributed renewable systems.

Strategy 2.2 – Assess feasible public and private locations for solar and wind installations of various scales in Montgomery County and adjacent jurisdictions.

Action 2.2.1 – Develop a ranking system to categorize sites based on economic, environmental, and social considerations.

Action 2.2.2 – Evaluate financial incentives to encourage solar development on brownfields and other preferred solar locations.

Action 2.2.3 – Examine feasibility of solar on industrial sites like the Dickerson power and incinerator facilities.

Action 2.2.4 – Work with other jurisdictions and the State to ensure coordinated efforts related to siting renewable energy facilities.

Action 2.2.5 – Examine the feasibility and benefit of solar on utility poles.

Strategy 2.3 – Expand the use of solar on public facilities.

Action 2.3.1 – Develop a ranking system to categorize sites based on economic, environmental, and social considerations.

Action 2.3.2 – Take advantage of any federal, state, and other funding sources to support deployment of solar on public facilities.

Action 2.3.3 – Maximize use of solar on public school facilities.

Action 2.3.4 – Develop/require communication and engagement tools at all public and commercial solar facilities to take advantage of opportunities to educate the public on the benefits of solar.

Action 2.3.5 – Develop multi-site solar PV project on public facilities through Power Purchase Agreement or similar mechanism to facilitate economies of scale.

Strategy 2.4 – Support modification of the State's net metering law, including addressing cap for individual projects (2 MW) and total project volume cap (1,500 MW).

Strategy 2.5 – Support expansion of community solar.

Action 2.5.1 – Evaluate environmental and ecological impact of using land in the agricultural reserve for solar.

Action 2.5.2 – Establish demonstration projects to co-locate PV solar with agricultural production (such as grazing) and pollinator meadows.

Action 2.5.3 – Create a new capacity target (specific to Mo. Co.) to allocate to community solar projects.

Action 2.5.4 – Create an incentive to support small (less than 300 kW DC) commercial installations or installations on non-profits' properties.

Strategy 2.6 – Working with the Public Service Commission and electric utilities, support an assessment of the ability of utilities to incorporate additional distributed energy.

Action 2.6.1 – Examine issues of feeder capacity, safety, load control, and grid stability.

Action 2.6.2 – Ensure rate systems equitably distribute costs among ratepayers.

Action 2.6.3 – Examine impact of battery systems on grid.

Strategy 2.7 -- Review the feasibility of implementing more energy conversion efficiency technologies in Montgomery County (i.e. co-generation, co-process, and heat recovery).

Action 2.7.1 Review the feasibility of community-based energy systems and energy storage.

Strategy 2.8 -- Review the feasibility of creating/expanding other clean renewable energy technologies in Montgomery County (other than wind and solar).

Action 2.8.1 Review the feasibility of energy harvesting from WSSC's water distribution system.

Strategy 2.9 – Establish demonstration projects to co-locate PV solar with agricultural production (such as grazing) and pollinator meadows.

Strategy 2.10 – Develop clean energy incentives for LMI households in certain zip codes.

Goal 3 – Expand the use of renewable energy to power buildings.

Strategy 3.1 – Evaluate policies requiring the electrification of new, substantially modified, and existing buildings.

Action 3.1.1 – Make efforts to convert existing buildings into solar ready buildings and offer incentives for such retrofits (similar to incentives offered under EmPower MD).

Action 3.1.2 -- Evaluate feeder line expansion by utilities to account for future solar needs and installation sizes in each neighborhood.

Action 3.1.3 – Evaluate utility rate structures for disadvantaged groups and upgraded infrastructure (e.g., SMART LEDs, time of use rates for EV charging stations).

Strategy 3.2 – Evaluate policies prohibiting the use of natural gas in new, substantially modified, and existing buildings.

Action 3.2.1 – Evaluate making all newly constructed buildings to be electric only.

Action 3.2.2 – For substantial construction or major retrofit to an all electric building, evaluate the need for a comprehensive recycling program that addresses old pipes and replaced gas infrastructure.

Strategy 3.3 – Evaluate policies requiring incorporation of solar, battery storage systems, and/or vehicle charging stations in new, substantially modified, and existing buildings.

Action 3.3.1 – Modify construction codes and streamline permitting processes for different building types related to incorporation of solar, battery storage systems, and/or vehicle charging stations.

Action 3.3.2 – Evaluate distribution and adoption of solar, battery storage systems, and/or vehicle charging stations in economically disadvantaged neighborhoods and address policies accordingly to encourage inclusion.

Goal 4 – Encourage economic development related to renewable energy

Strategy 4.1 – Increase education in renewable energy and sustainability.

Action 4.1.1 – Offer an Associate of Applied Science in Renewable Energy at Montgomery College (MC) and provide 100% free tuition for County residents who obtain this degree.

Action 4.1.2 – Provide incentives for solar companies, public utilities, and public agencies to offer internships for students enrolled in Renewable Energy program at MC.

Action 4.1.3 – Provide incentives for solar and other renewable energy companies and public utilities to offer apprenticeship programs/on-the-job training.

Action 4.1.4 – Provide scholarships for degrees in environmental sustainability programs at State universities.

Strategy 4.2 – Establish a Green Technology Innovation Fund to attract and support promising business start-ups offering solutions that reduce GHG emissions and/or contribute to essential clean energy infrastructure.

Strategy 4.3 – Encourage social enterprises, non-profits, and small and local businesses developing renewable energy solutions.

Action 4.3.1 – Prioritize social enterprises, non-profits, and small and local businesses developing renewable energy solutions in Montgomery County's bids and RFPs.

Action 4.3.2 – Lower tax liability and generate incentive mechanisms for any conversion to clean energy that has been worked on by social enterprises, non-profits, and small and local businesses developing renewable energy solutions.

Strategy 4.4 -- Encourage union workers to be contracted and develop renewable energy solutions.

Action 4.4.1 - Prioritize companies that use union workers in Mo Co’s bids and RFPs.

Action 4.4.2 - Lower tax liability and generate incentive mechanisms for any conversion to clean energy that has been worked on by these companies.

Strategy 4.5 – Promote an economic transition that is just and fair for all workers, especially those that have been laid off by “conventional” power production.

Action 4.5.1 – Encourage the establishment of new unions organized “by sector” (i.e. a “solar workers union”, a “wind workers union”, etc.).

Action 4.5.2 – Ensure workers employed in "conventional" power production find a new satisfying and well-paying jobs with the transition to clean energy.

Action 4.5.3 – Coordinate with WorkSource Montgomery and its American Job Centers to emphasize renewable energy and efficiency career support and partnerships.

Strategy 4.6 - Emphasize the clean energy future in K-12 school curricula (see Italy example) or extracurricular programs, especially in collaboration with Thomas Edison H.S. of Technology; use solar + storage on all schools (see Action 2.3.3) to educate students on environmental and energy issues.

Strategy 4.7 - Explore more public private partnership opportunities to support innovation opportunities.

Goal 5 – Establish a dedicated, secure funding source to support renewable energy programs and financial incentives.

Strategy 5.1 - Assess and implement a carbon tax in Montgomery County.

Action 5.1.1 -- Identify the best mechanism for a Mo Co carbon tax. Look at other states and jurisdictions that have done it.

Action 5.1.2 -- Tie into the MD (state level) new bill to tax carbon.

Action 5.1.3 -- Use revenues to implement climate change solutions.

Strategy 5.2 - Develop clean energy incentives for LMI households in certain zip codes, like Prince George's County.

Action 5.2.1 -- Identify ZIP codes that have a concentration of LMI households, and provide incentives for residential installation. (If a solar installation is not suitable, give homeowner the choice for geothermal installation, or weatherization/insulation, and other clean energy technology.)

Climate Adaptation Workgroup:

Goal 1: Prioritize people and communities that are the most vulnerable and the most sensitive to the impacts of climate change

Strategy 1.1 - Adopt strategies and actions that focus on building resilience for vulnerable and marginalized communities

Action 1.1.1 - Engage vulnerable communities to increase awareness and to co-develop preparedness solutions

Action 1.1.2 - County policies to improve the resilience of communities and neighborhoods must ensure that resilience strategies do not cause or exacerbate inequities and displacement

Action 1.1.3 - Integrate projections of climate change impacts, improve GIS data layers on demographics and vulnerable populations, and conduct vulnerability assessments to aid in targeting resources and addressing impacts on vulnerable populations and communities

Action 1.1.4 - Update the County Hazard Mitigation Plan and emergency response operations to prioritize vulnerable areas where retrofit plans are least effective and include post-disaster policies for building back to be more resilient

Action 1.1.5 - Review all county operations to prioritize actions for the most vulnerable communities in the most essential sectors of our society, particularly hazard mitigation, emergency response, health department services, transportation, residential services, parks and landscaping, building-related codes and standards, etc

Action 1.1.6 - Expand the number of emergency shelters and cooling stations based on need and ensure they are readily accessible and themselves retrofitted to the highest standards, including to avoid flooding, withstand strong wind, extreme temperatures, power outages, and depleted water supplies

Action 1.1.7 - Ensure that climate change policies, planning and response plans include highly vulnerable populations, such as children, the elderly, those with underlying health conditions, and economically disadvantaged populations. Collaborate across sectors, and among nongovernmental and governmental entities, to develop comprehensive mitigation and adaptation plans that protect the most vulnerable

Action 1.1.8 - Adopt standards and practices for outdoor workers and farm workers to protect their health and safety during extreme events

Action 1.1.9 - Ensure adequate facilities and protections for homeless population during extreme cold, extreme heat, or severe storm events

Action 1.1.10 - Provide incentives and subsidies to landlords and low-income homeowners to install adaptive technologies and retrofit buildings, and where necessary,

adopt county codes and standards requiring climate-adapted housing and development in targeted areas

Strategy 1.2 - Prioritize reducing health risks of the most vulnerable populations

Action 1.2.1 - Expand urban tree canopy and green infrastructure in low-income neighborhoods, especially targeting areas with high pedestrian traffic to mitigate urban heat island effects and to provide cool corridors for walking

Action 1.2.2 - Promote and subsidize installation of energy efficient air conditioning in low income housing and rental properties, especially during the summer which is getting longer and hotter

Action 1.2.3 - Provide local cooling and cell phone recharging centers, including use of parks, libraries, recreation centers, schools, and other public facilities

Action 1.2.4 - Adopt requirements and/or incentives for landlords to install protections against basement flooding and to mitigate mold

Action 1.2.5 - Review the ability of Lake Needwood Dam and all other County high-and significant-hazard dams to withstand stronger tropical and inland storm and revisit potential buyouts of high-risk homes downstream

Action 1.2.6 - Conduct a vigorous public education campaign to alert residents to risks of flooding and how to protect themselves, including risks of asthma due to mold, wet basements, etc

Action 1.2.7 - Amend county building codes requiring developers in areas undergoing significant land cover change to address stormwater runoff impacts of increased impervious cover on existing homes

Action 1.2.8 - Direct the County Department of Health and Human Services to monitor and address a broad range of climate-related health impacts, including vector-borne diseases (mosquitos, ticks), mold and asthma, water-related illnesses, food safety, temperature stress, and mental health, with a particular emphasis on the most vulnerable populations

Goal 2: Reduce the risks and impacts of higher summer temperatures

Strategy 2.1 - Establish county-wide temperature reduction goals

Action 2.1.1 - Deploy a uniformly distributed network of small temperature and humidity sensors… (HOBOS) to monitor heat and reduce heat-related mortality and/or morbidity

Action 2.1.2 - Conduct regional climate modeling to assess neighborhood-scale climate and health benefits of a tree planting campaign or a cool roofing ordinance

Action 2.1.3 - Develop an urban heat vulnerability index and mitigation plan to prepare for higher temperatures and more frequent extreme heat. Use this data to inform decisions

made related to building codes, emergency management plans, and other climate change related sectors

Action 2.1.4 - Track the impact of extreme heat mitigation and adaptation strategies and share lessons learned

Strategy 2.2 - Promote cool and energy efficient building standards for both the public and private sectors

Action 2.2.1 - Promote use of cool materials (cool roofs, cool pavements and road surfaces, green walls

Action 2.2.2 - Evaluate and adopt model building codes for green roofs/cool roofs, pavements, and green walls. Incorporate performance goals of codes into requirements for approved public building projects and private construction standards for permit approval

Action 2.2.3 - Evaluate and adopt flexible building codes that incentivize or require new and renovated buildings to minimize the energy required to operate the building under extreme weather conditions or power loss, while also protecting citizens (residential and occupational) against extreme heat

Action 2.2.4 - Use energy-efficient air conditioning and other building infrastructure that reduce energy use, reduce waste heat, and minimize urban heat gain

Action 2.2.5 - Tactically encourage airflow for optimum ventilation inside and around a building or development

Action 2.2.6 - Consider design strategies, such as operable windows or cooling systems connected to backup power sources, that help maintain safe indoor temperatures during hot-weather power outages

Action 2.2.7 - Assess and monitor long-term risks from extreme heat over the lifetime of a building, development, or city to understand the likely impacts on users and community members

Action 2.2.8 - Work with MCPS to revise their temperature plan to consider the heat island effect of artificial turf

Action 2.2.9 - Conduct review of performance of road, rail, bridge and other transit materials under high heat conditions, and consider transportation design options that minimize urban heat island effect

Strategy 2.3 - expand the county's urban tree canopy and greening programs

Action 2.3.1 - Analyze tree canopy in Montgomery County and plant trees in communities with limited tree canopy to grow a more equitable tree canopy by 2028

Action 2.3.2 - Adopt and implement an aggressive goal to plant more trees throughout the County

Action 2.3.3 - Develop a strategy focused on protecting the County's existing trees from extreme drought and flash drought, including educating homeowners on how to protect their trees from severe drought

Action 2.3.4 - Educate homeowners and the landscaping sector on protecting their trees from severe drought, eliminating mulch mounds that kill trees, and other tree protection measures

Action 2.3.5 - Work with and require utility providers to protect trees

Action 2.3.6 - Provide an incentive for residential and multi-family property owners by providing a 0.5% annual property tax relief for every tree planted and healthy beyond 20 trees per acre

Action 2.3.7 - Adjust the County Tree Canopy Ordinance that assesses builders a fee for removing trees to require functional mitigation that replaces the lost benefit of trees, e.g., cooling, stormwater abatement, watershed replenishment, etc. Require developers to seek revisions to their permits before removing trees. Use the fee to pay for off-site functional mitigation

Action 2.3.8 - Strategically maximize shade—through built and natural cover—for all buildings and public spaces. Plant more trees and vegetation on public lands to provide cooling, shade, and heat/CO2 absorption

Action 2.3.9 - Work with federal and other jurisdictions located in Montgomery County to expand shading and cooling

Action 2.3.10 - Establish green corridors and other alternative, heat-sensitive planning measures

Action 2.3.11 - Improve streetscape standards, such as permeable surfaces, wider bike lanes for mitigation, infiltration, and tree canopy increase

Strategy 2.4 - Promote landscaping in the private sector to expand shade and reduce urban heat islands

Action 2.4.1 - Adopt credits for builders for the percentage or coverage of shade trees retained and planted on-site to encourage the use of shade trees to provide additional summer protection for lower floors of building facades and green roofs to reduce heat island effect while providing comfortable exterior environments

Action 2.4.2 - Educate and work with the landscaping community to understand the impacts of climate change and incentivize them to adopt best climate practices, such as reducing use of fossil fuels in equipment, planting native- and climate-resilient species, protecting trees (no more mulch mounds), using water-wise strategies, etc

Action 2.4.3 - Prioritize the preservation of green space on new development and redevelopment parcels; and expand green space on existing development parcels

Action 2.4.4 - Ensure greening selections are appropriate for local climate conditions and water availability

Goal 3: Reduce risks and impacts of more intense storms

Strategy 3.1 - Improve hydrological and meteorological data collection and analysis of wet weather and storms, considering climate change over the next 30 to 100 years, and incorporating trends in land use/land cover change

Action 3.1.1 - Work with the Montgomery County Delegation to support legislation and appropriations to fund NOAA to update mid-Atlantic precipitation statistics, along with the States of Virginia, North Carolina and others, that are already so engaged. Subsequently, work with FHWA and NOAA to revise Maryland's IDF precipitation statistics and to adopt a methodology for updating future precipitation statistics for use in planning and design

Action 3.1.2 - Update County floodplain maps to the 30-acre watershed, and map small drainage areas that are currently unmapped. Ensure that development permits are not issued without a Natural Resources Inventory that includes the requirement to delineate unmapped floodplains in the vicinity of the proposed development

Action 3.1.3 - Improve impervious surface mapping throughout the county

Action 3.1.4 - Develop a report identifying all aspects of current Montgomery County Code, including requirements of the State of Maryland, that include reference to rainfall and water flow in design standards and other requirements. For each requirement, report on the basis of how and when the numerical quantity requirement was derived, and identify any efforts by federal, state, academic, or private sector efforts to evaluate adequacy of such standards. Examine the Maryland Stormwater Design Manual, NOAA Atlas 14, TR-55, other code or statute, noting the date, source, and method of data development

Action 3.1.5 - Conduct a citizen survey on home flooding events to identify unreported flooding" hotspots" and understand home flooding trends

Action 3.1.6 - Consult with County flood remediation and cleanup businesses on trends, costs, and hotspots and areas with changing flooding vulnerabilities

Action 3.1.7 - Deploy more rain and stream gauges throughout the county to build a more accurate observational ability to monitor changes over time

Strategy 3.2 - Adopt aggressive requirements for all new development to transition Montgomery County to realities of climate change

Action 3.2.1 - Amend County building codes and enforcement policies post-permitting to ensure all runoff controls, including conservation plantings in place of structural controls, are maintained and effective. Revisit current policies enabling waivers, unenforceability of green infrastructure maintenance, and impacts on neighbors. Ensure that county codes

minimize impacts of increased flooding on immediately adjacent neighbors, taking into account both increased intensity of rainfall and increased impervious ground cover

Action 3.2.2 - Develop climate resilience guidelines for new development projects that take into account reasonably foreseeable future hydrologic conditions in the drainage area

Action 3.2.3 - Before being approved by a Zoning Commission, BZA, or other related reviewal process, new private developments must employ a variety of climate-hazard mitigation techniques, such as cooling, stormwater retention, sequestration tactics, etc

Action 3.2.4 - Evaluate the sequencing of agency approvals for new building development projects to determine the best point at which to incorporate flood review

Action 3.2.5 - Hire a consultant to identify and evaluate a variety of trends within architecture and sustainable design that has proven effective and feasible in implementation and outcome regarding risk mitigation

Action 3.2.6 - Require all planned unit developments and publicly financed projects to complete an adaptation checklist based on climate resilience guidelines

Action 3.2.7 - Require contractors to send notices to all adjacent homeowners of potential impacts, including suggestions for how to protect their own properties from future rainfall events and runoff impacts

Action 3.2.8 - Adopt aggressive county codes to limit impervious concrete surfaces and require the use of pervious pavements, especially in county-funded projects. For example, sidewalks, driveways and parking lots should use pervious pavements to reduce runoff and flooding that overwhelms the storm sewer system

Action 3.2.9 - Aggressively promote and incentivize use of green roofs, native plantings, rain gardens, rain barrels, runoff retention, and other nature-based ways to reduce runoff and to minimize the heat island effect. (new and existing buildings). However, when used for stormwater management, ensure that green remedies are maintained and effective over time, and are combined with appropriate gray infrastructure to manage excess water flow

Strategy 3.3 - Work with homeowners, businesses and the building and services sectors to retrofit existing homes and buildings to protective standards

Action 3.3.1 - Evaluate existing stormwater management environmental site design BMPS as well as structural BMPs and work with homeowners and the construction and landscaping sectors to adopt upgraded BMPs

Action 3.3.2 - Put a moratorium on stormwater waivers until updated practices are adopted by the County to reduce flooding

Action 3.3.3 - Conduct a public education campaign on FEMA NFIP insurance; develop an incentive program to encourage residents to obtain flood insurance no matter where they live in the county

Action 3.3.4 - Conduct a vigorous public education campaign to alert homeowners and renters to risks of flooding and how to protect themselves, including risks of asthma due to mold, wet basements, etc

Action 3.3.5 - Educate home and property owners and promote strategies for managing water on their property; e.g., rainscapes and rain barrels to slow roof runoff, retain water for landscape use, reduce impacts of stream "downcutting" and erosion

Action 3.3.6 - Investigate programs to incentivize retrofitting existing homes including rebates, discount programs, working with insurance companies to provide discounts, etc

Action 3.3.7 - County hazard mitigation and emergency response plans should prioritize vulnerable areas where retrofit plans are least effective and should include post-disaster policies for more resilient recovery requirements

Strategy 3.4 - Initiate a comprehensive review of transportation infrastructure, dams, and other public utilities and undertake efforts to improve preparedness and resilience

Action 3.4.1 - Conduct a comprehensive review of roads, bridges, and culverts throughout Montgomery County; identify those in need of repair and assess adequacy of capacity based on overlay of land use changes, precipitation projections, and other factors affecting flow and discharge. Target priority roads and culverts to repair and mitigate potential damages. Specifically focus on small culverts, storm drains, swales and ditches, curbs and gutters

Action 3.4.2 - Revisit potential voluntary buyouts in areas at highest risk of catastrophic flooding, especially below the Lake Needwood Dam. Retrofit at-risk buildings or remove them from high-risk areas. Address potential unintended consequences of retrofitting

Action 3.4.3 - Evaluate emergency evacuation routes for adequacy under future climate scenarios

Action 3.4.4 - Assess whether the County (and its dam owners) are using best practices for operations, emergency action planning, maintenance, and alert/warning

Action 3.4.5 - Renew efforts to evaluate and address risk of communities located below dams and along major waterways

Goal 4: Protect public health from climate-driven impacts

Strategy 4.1 - Integrate climate change risks into Montgomery County health and human services, hazard mitigation, and emergency response operations

Action 4.1.1 - Review information from the State of Maryland, the CDC, and southern states that are analogues to Montgomery County's climatic future, to understand our future health profile

Action 4.1.2 - Engage with the State and the Center for Disease Control and take advantage of available grants, pilot programs, technical assistance, and public outreach events

Action 4.1.3 - The County Department of Health and Human Services should develop a comprehensive, long-range, and proactive Climate Change and Public Health Strategy that addresses the health risks exacerbated particularly by climate change, including anticipating public anxieties over loss of services during major climate events

Action 4.1.4 - Work with the Center for Disease Control and the State of Maryland Health Department to adopt health surveillance and early warning systems to monitor and predict climate change impacts

Action 4.1.5 - Ensure that climate change policies, planning and response plans include highly vulnerable populations, such as children, the elderly, those with underlying health conditions, and economically disadvantaged populations. Collaborate across sectors, and among nongovernmental and governmental entities, to develop comprehensive mitigation and adaptation plans that protect the most vulnerable populations. (dup)

Action 4.1.6 - Quantify potential health impacts to inform decision making and strategies, with analysis of impacts on vulnerable populations and geographies

Strategy 4.2 - Minimize food, water, and vector borne disease

Action 4.2.1 - Hire a County entomologist to specialize in managing vectors of disease that are encroaching and becoming more prevalent in the County, as host ranges expand and over-winter

Action 4.2.2 - Expand the mosquito control program especially for the Asian Tiger (Aedes aegypti) mosquito

Action 4.2.3 - Install stormwater infrastructure abatement to reduce ponding

Action 4.2.4 - Manage deer population that carries disease from ticks

Action 4.2.5 - Work with WSSC to put in place a more robust Harmful Algal Bloom monitoring programs, including establishing baseline data to track incidents

Action 4.2.6 - Coordinate with the Potomac River Basin Commission and upstream communities to monitor HABs and reduce stressors that result in HABs

Strategy 4.3 - Protect the most vulnerable from asthma, heart attacks, and other respiratory illnesses

Action 4.3.1 - Implement heat abatement programs (see section under extreme temperature)

Action 4.3.2 - Adopt programs to prevent home flooding and to avoid residential mold (see section addressing storms and floods)

Action 4.3.3 - Develop and expand mental health programs aimed at managing climate change-induced stress

Strategy 4.4 - guard against increasing risks of motor vehicle accidents and drowning

Action 4.4.1 - Assess first-response resources available in the county against increased frequency of significant flooding/flash-flooding events and other emergencies. This should include swift-water rescue and consideration of vehicles that can navigate high water situations

Action 4.4.2 - Invest in automated roadway sensors in roadways prone or at risk of flooding to reduce incidents of drowning

Strategy 4.5 - Undertake a vigorous public outreach campaign aimed at empowering the public with the knowledge and support avoid and minimize health effects of climate change

Action 4.5.1 - Train health professionals to understand the health effects of climate change on families, children, the elderly, those with underlying health conditions, and economically disadvantaged populations

Action 4.5.2 - Coordinate with non-health sector policies that offer co-benefits (reduce harmful emissions and promote health) such as clean energy, healthy food production and smart community design

Action 4.5.3 - Conduct a vigorous public education campaign on actions to reduce the increasing risks due to climate change and extreme weather

Goal 5: Ensure the availability and sustainability of quality drinking water supplies to support a growing and thriving Montgomery County

Strategy 5.1 - Expand programs to develop localized self-sufficiency and resilience to water shortages

Action 5.1.1 - Update the County Hazard Mitigation Plan to more robustly address water supply and other drought concerns

Action 5.1.2 - Adopt policies to expand water efficiency and conservation as a long-term effort, not just as an emergency response to impending drought, e.g. public education and incentive campaigns; use of water efficient fixtures in all county facilities; water efficient fixtures and landscape design in building codes and permits; etc

Action 5.1.3 - Understand the current pattern of water demand within various economic sectors as well as residential uses; understand supply chain risks; and design outreach and compliance campaigns for commercial and residential consumers both to minimize supply chain impacts and to enlist support for reducing demand

Action 5.1.4 - Expand existing DEP programs and develop additional programs for water capture and reuse to alleviate strain on potable water supply, e.g., expand the County's

rain barrel program to encourage more on-site reuse of water; develop policies for reuse of graywater for irrigation or industrial processes; etc

Action 5.1.5 - Support efforts to build off-river water storage at the Travilah Quarry and examine other solutions for water storage including aquifer storage and recovery

Action 5.1.6 - Expand coordination and mutual assistance with neighboring counties and incorporated areas that rely on similar water sources to enact the broader drought management strategy

Strategy 5.2 - Protect water quality that threatens probability of water supplies

Action 5.2.1 - Forcefully oppose all efforts to build the 3.5-mile "Potomac Pipeline" that would bring natural gas from Pennsylvania to West Virginia, which would threaten water supply for 6 million people in the metro area; and which would fuel the continued use of fossil fuels in Maryland

Action 5.2.2 - Redouble efforts to protect the Poolesville sole source aquifer, Potomac and Monocacy Rivers, and high-quality watersheds other water supply resources through wise land use plans and stream corridor revitalization

Action 5.2.3 - Strengthen stormwater runoff controls to prevent nutrient runoff into surface water

Action 5.2.4 - Review and amend road salting and treatment to protect drinking water sources

Action 5.2.5 - Given the increasing incidence of Harmful Algal Blooms nationwide, and for the first time in the Rocky Gorge (Duckett) Reservoir, Montgomery County should include such incidences in its emergency response alert system

Action 5.2.6 - Be alert for potential sources of pollution in Montgomery County that endanger the quality of water supplies, e.g. discharges from the Dickerson Incinerator; sediment and turbidity from stormwater and creek bed scour; nutrients from yards, pets, and agriculture; toxics from industrial facilities in our watersheds, etc

Strategy 5.3 - Integrate actions that recognize the inter-dependency and co-benefits between water, energy, and other resilience strategies

Action 5.3.1 - Invest in resilient power systems for critical drinking water facilities, including pumps moving water to and from treatment facilities

Action 5.3.2 - Asses all wastewater pumping stations in Montgomery County for risk to energy disruption, and undertake efforts to improve their resilience (back-up electrical generation; protection from flooding; access for emergency crews; etc.)

Action 5.3.3 - Press WSSC to accelerate its goal beyond reducing energy use 65% by 2035. Collaborate on opportunities to accelerate WSSC's move to bioenergy generation

(poop to pump), anaerobic food digesters, use of water storage and gravity as a source of electricity; etc

Action 5.3.4 - Incorporate consideration of protecting water supplies as a co-benefit of strategies addressing other climate risks, e.g., ensure flood mitigation efforts, heat island mitigation, and design of infrastructure bring direct co-benefits to programs addressing drought

Goal 6: Conserve and restore habitat to support healthy populations and ecosystems, reduce non-climate stressors on natural resources, and promote climate-resilient agriculture

Strategy 6.1 - Conserve, expand, and connect natural and protected areas

Action 6.1.1 - Adopt and implement an aggressive goal to plant more trees throughout the County. (dup)

Action 6.1.2 - Develop a strategy focused on protecting the County's existing trees from extreme drought and flash drought, including educating homeowners on how to protect their trees from severe drought. (dup)

Action 6.1.3 - Provide an incentive for residential and multi-family property owners by providing a 0.5% annual property tax relief for every tree planted and healthy beyond 20 trees per acre. (dup)

Action 6.1.4 - Educate homeowners and the landscaping sector to eliminate mulch mounds that kill trees. (dup)

Action 6.1.5 - Educate homeowners and incentivize them to adopt low management lawns that are more resilient, sequesters carbon, and reduces use of motorized (fossil fuel powered) maintenance

Action 6.1.6 - Plant native tree species in the mid to northern portions of their geographic range and facilitate migration of tree species that may be more suitable for Maryland's new climate

Action 6.1.7 - Update the 2017 Park, Recreation and Open Space Plan to expressly identify and address climate change impacts to parks and natural areas

Action 6.1.8 - Prioritize land acquisition to protect existing parks and natural areas, create natural buffers, and enhance connectivity of natural areas and stream corridors

Action 6.1.9 - Map and protect migration corridors for plants and animals adjusting to drought and other climate conditions

Action 6.1.10 - Increase protection of habitat for federal and state endangered and threatened species

Strategy 6.2 - Restore degraded habitat and enhance suburban habitat

Action 6.2.1 - Restore riparian areas to reduce stormwater scouring, enhance habitat, and provide shading to reduce summer water temperatures

Action 6.2.2 - Remove barriers to fish passage (e.g., shad and river herring)

Action 6.2.3 - Restore forested areas damaged by storms, disease, and fire

Action 6.2.4 - Encourage succession planting to improve forest ecosystem health

Action 6.2.5 - Manage deer populations to limit damage to understory plants and young trees

Action 6.2.6 - Educate and encourage suburban homeowners to plant native trees, understory plants, pollinator gardens, and to reduce area of managed lawns

Strategy 6.3 - Manage invasive and non-native species

Action 6.3.1 - Control invasive species on county-owned properties and in natural areas, and replant cleared areas with native species to prevent invasives from regaining foothold. Ensure such efforts include follow-up and maintenance

Action 6.3.2 - Manage pests and pathogens affecting the urban canopy and forested areas, including deer populations

Action 6.3.3 - Monitor the arrival of new species (beneficial migration and invasive species) and track the loss of native species and climate-driven changes to native species

Action 6.3.4 - Educate homeowners and landscapers about native, non-native, and invasive species and changes in native species due to climate change

Strategy 6.4 - Reduce non-climate stressors on native species and ecosystems

Action 6.4.1 - Put in place stream buffers where they don’t exist and enlarge existing buffers to reduce pollutant runoff, cool water temperatures, and restore riparian structure and function

Action 6.4.2 - Control stormwater running into rivers and streams (see recommendations for improved stormwater management strategies under flood control section)

Action 6.4.3 - Provide education for well/septic users to ensure best practices in maintaining systems

Action 6.4.4 - Plant pollinator-friendly and native plantings on county-owned properties and public rights-of-way; educate homeowners about pollinator friendly practices (e.g., pesticides)

Strategy 6.5 - Promote climate-resilient agricultural practices

Action 6.5.1 - Encourage farmers to diversify crop varieties and select heat-tolerant crops to increase resilience to climate change impacts

Action 6.5.2 - Monitor climate change and impacts to agriculture and adapt agricultural practices to optimize resource allocation and production

Action 6.5.3 - Encourage farmers to improve soil health (e.g., compost, cover cropping, crop rotation)

Action 6.5.4 - Establish demonstration projects for carbon-sequestering agriculture

Action 6.5.5 - Promote conservation agriculture measures (zero and/or minimum tillage, efficient water use); keep soil covered year-round; promote natural methods of pest control; plant flood-resilient species near floodplains

Action 6.5.6 - To increase carbon sequestration, incentivize landowners to farm regeneratively, to plant trees for reforestation, and to reduce large-lot lawn size

Action 6.5.7 - Leverage the Maryland Climate Change Commission's recommendations to expand agriculture in Montgomery County

Action 6.5.8 - Expand availability of community gardens in urban/suburban areas to reduce farm-to-table distance and promote food security

Goal 7: Support economic opportunities and address economic challenges for climate adaptation

Strategy 7.1 - Business and development: minimizing disruption and maximizing opportunities

Action 7.1.1 - Convene a business round table or task force to evaluate business opportunities posed by a climate-resilient and carbon free County, to consider potential impacts and business displacements, and to engage on promoting ways to reduce greenhouse gases and prepare for the impacts of climate change

Action 7.1.2 - Incentive and support businesses that build the transition to the clean energy and green infrastructure economy, such as transition from gas stations to electric fueling stations

Action 7.1.3 - Develop educational and training programs to build career pathways for a Green Workforce trained in the technology, design, construction and maintenance of the range of climate adaptation methods

Action 7.1.4 - Work with the Montgomery County Economic Development Corporation to build a Climate Resilient Montgomery brand that attracts young people, new businesses, and migration of populations, and helps showcase and build the economy of the future

Action 7.1.5 - Evaluate potential for attracting people, businesses, and government agencies migrating away from tidal areas of D.C., subject to flooding from sea level rise and overland flooding

Action 7.1.6 - Prepare to welcome environmental refugees from around the world and across Maryland and leverage their skills and knowledge to diversify the Montgomery County economy

Strategy 7.2 - Financing adaptation

Action 7.2.1 - Expand the County Green Bank to incorporate support for preparedness and resilience to the impacts of climate change, and to leverage other sources of funding

Action 7.2.2 - Invest in a process and staffing to fully leverage federal and state funding opportunities; anticipate County needs and programs and advance preparation of proposals to take advantage of funding solicitations, despite those being out of step with the traditional CIP process. Have a proposal 'in the drawer,' and be ready to seek funding as it becomes available

Action 7.2.3 - Select a few climate adaptation projects to demonstrate how to build their financial and evidentiary case

Action 7.2.4 - Retain a consultant to advise on how to revise County benefit-cost analyses to evaluate adaptation project investments, e.g., how to incorporate future benefits and avoided costs, conduct multivariate analysis, and weigh the benefits and costs of adaptation vs. business-as-usual solutions

Action 7.2.5 - Review the CIP budgeting process, update out-of-date baselines, and link capital programs to better keep up with maintenance and restoration of infrastructure and natural systems that are increasingly being damaged by the impacts of climate change

Action 7.2.6 - Consider ways to leverage public funds for adaptation such as with public-private partnerships and performance contracting; consider models such as Portland's Clean Energy Community Benefits Fund

Strategy 7.3 - Incentivizing adaptation

Action 7.3.1 - Establish loans or other programs to help businesses and institutions purchase non-fossil fuel dependent back-up generators and cooling/heating equipment

Action 7.3.2 - Adopt credits to builders for the percentage or coverage of shade trees retained and planted on-site to encourage the use of shade trees to provide additional summer protection for lower floors of building facades and green roofs to reduce heat stand effect while providing comfortable exterior environments. (dup)

Action 7.3.3 - Provide an incentive for residential and multi-family property owners by providing a 0.5% annual property tax relief for every tree planted and healthy beyond 20 trees per acre. (dup)

Action 7.3.4 - Adjust the County Tree Canopy Ordinance that assesses builders a fee for removing trees to require functional mitigation that replaces the lost benefit of trees, e.g., cooling, stormwater abatement, watershed replenishment, etc. Require developers to seek

revisions to their permits before removing trees. Use the fee to pay for off-site functional mitigation. (dup)

Action 7.3.5 - Aggressively promote and incentivize use of green roofs, native plantings, rain gardens, and other nature-based ways to reduce runoff and cool heat island effect. (new and existing buildings). (dup)

Action 7.3.6 - Conduct a public education campaign on FEMA NFIP insurance; develop incentive program to encourage residents to obtain flood insurance. (dup)

Action 7.3.7 - To increase carbon sequestration, incentivize landowners to farm regeneratively, to plant trees for reforestation, and to reduce large-lot lawn size. (dup)

Action 7.3.8 - Incentivize solar on barns and storage shed rooftops, as well as on industrial properties such as the Dickerson Power Plant and the acreage under transmission power lines

Action 7.3.9 - Provide incentives and subsidies to landlords and low-income homeowners to install adaptive technologies and retrofit buildings and homes. (dup)

Action 7.3.10 - Adopt requirements and/or incentives for landlords to install protections against basement flooding and to mitigate mold. (dup)

Goal 8: Conduct vigorous outreach and engagement campaign to accelerate adaptation and resilience

Strategy 8.1 - Build public awareness about the County's actions on hazard mitigation and adaptation to climate change

Action 8.1.1 - Update information given to 411/911 emergency services and update web pages for Health and Human Services, Office of Emergency Management, etc

Action 8.1.2 - Initiate traveling "roadshows" to go to community organizations, schools, hospitals, community centers, etc

Strategy 8.2 - Build community preparedness strategies to increase resilience

Action 8.2.1 - Undertake a vigorous public outreach campaign aimed at empowering the public with the information on how to protect their families and homes from the impacts of climate change

Action 8.2.2 - Organize and support events that contribute to community resilience and company "neighborliness" so that residents have a climate-ready social network and are aware of resources before an emergency occurs

Action 8.2.3 - Modify alert systems and communication with schools, hospitals, homeless shelters, and facilities for the elderly or disabled, to include high heat and extreme cold warnings, and ensure temperature is included in public emergency response plans

Action 8.2.4 - Train health professionals to understand the health effects of climate change on families, children, the elderly, those with underlying health conditions, and economically disadvantaged populations

Action 8.2.5 - Collaborate with non-health sector policies that offer co-benefits (reduce harmful emissions and promote health) such as clean energy, healthy food production and smart community design

Action 8.2.6 - Conduct a vigorous public education campaign on actions residents can take to reduce their risks from climate change and extreme weather

Strategy 8.3 - Engage the business community about the potential impacts and opportunities posed by climate change

Action 8.3.1 - Work with the business and development community to understand potential impacts of climate change, including supply chain disruptions. (dup)

Action 8.3.2 - Enlist the support of the business and development community to adopt water, electric, and fuel conservation strategies to minimize risk and advance toward a more resilient County. (dup)

Strategy 8.4 - Work with other jurisdictions to develop rules, amend codes, and build capacity for adaptation

Action 8.4.1 - Support legislation in the Maryland Statehouse for climate and adaptation related legislation:

- Heat Stress Protection Act – Protecting Workers from Dangerous Heat Exposure (Del. Charkoudian)
- Organics Recycling and Waste Diversion – Food Residuals (Del. Charkoudian) - compost bill
- Healthy Soils Act (Del. Stein)
- Ending Subsidies for Incineration (HB438/SB560)
- Climate Solutions Act (HB1425/SB926)
- Public Service Commission Climate Test (HB531/SB656)
- Community Choice Energy

Action 8.4.2 - Work with Maryland and NOAA to ensure that NOAA's outdated and inadequate Atlas 14 precipitation statistics for Maryland are updated and recalculated, and ensure that Maryland update and revise stormwater, floodplain, and other codes and regulations that reference Atlas 14, TP40, or any previous NOAA publication

Action 8.4.3 - Engage with the State and the Centers for Disease Control to take advantage of health and climate change-focused grants, pilot programs, technical assistance, and public outreach events

Action 8.4.4 - Engage with the climate change adaptation science community to access expert resources and technical assistance, including the USGS Southeast and Northeast

Climate Adaptation Science Centers; the NOAA Urban Northeast CCRUN RISA and the Mid-Atlantic MARISA); and the USDA North Atlantic and South Atlantic Landscape Conservation Cooperatives

Goal 9: Reevaluate and update county operations, strategies, and codes to account for the risks of climate change impacts as well as to reduce greenhouse gases

Strategy 9.1 - Create a common set of projections for Montgomery County using moderate to high projections of greenhouse gas scenarios

Action 9.1.1 - Use the most recent downscaled climate models and methods under moderate and high emission scenarios to evaluate potential climate changes for Montgomery County

Action 9.1.2 - Form a County Scenario Development Team (SDT) tasked with developing various climate and socioeconomic future scenarios for use in county Vulnerability Assessments

Action 9.1.3 - Develop guidance for county departments scenarios and methods for conducting climate change-informed reviews of operations. Include how to evaluate co-benefits as well as trade-offs between adaptation strategies, sequestration strategies, and greenhouse gas mitigation strategies

Action 9.1.4 - Work with other regional entities (e.g., Maryland National Capital Park and Planning Commission, State of Maryland, Montgomery County Public Schools, Metro DC Council of Governments,, etc.) to evaluate climate change projections, climate analogs from states to the south, and other studies to inform risk assessments; Examine and coordinate with other regional analyses, e.g., DC Adaptation Plan, Washington Suburban Sanitary Commission (WSSC) PG County evaluation; WSSC Blue Plains' analyses, Pepco analyses, etc

Action 9.1.5 - Integrate data collection, monitoring, and evaluation of progress into ongoing County operations

Strategy 9.2 - Conduct a bottom-up evaluation of county departments, operations, and facilities; and update county codes, operations, and services

Action 9.2.1 - All county departments must develop bottom-up climate change vulnerability assessments by July 1, 2021, incorporating the implications of the County's range of plausible future scenarios of risk (temperature, precipitation, drought, etc.) to identify robust strategies including opportunities for achieving co-benefits (e.g., sequestration

Action 9.2.2 - Analysis and consideration of adaptation options must include an economic analysis of avoided costs or cost of inaction in the cost-benefit analysis used for decision making

Action 9.2.3 - Mainstream climate change mitigation and adaptation in all county operations and services

Action 9.2.4 - Strategies and plans should include an examination of co-benefits and potential unintended consequences of potential adaptation actions, including trade-offs with greenhouse gas mitigation policies

Action 9.2.5 - All county departments should undertake to coordinate strategies and plans as cross-departmental efforts, using shared information and shared responsibilities

Strategy 9.3 - Implement and improve the County Hazard Mitigation Plan

Action 9.3.1 - Prioritize full and robust implementation of the existing 2018 County Hazard Mitigation Plan

Action 9.3.2 - Update the Hazard Mitigation Plan to fully assess the impact of future climate change and expected land use and development; identify and prioritize vulnerable populations; include evaluation of unincorporated urban areas in the County (e.g., Silver Spring, Bethesda); and conduct a full capability assessment that identifies departmental limitations

Action 9.3.3 - Update the County Emergency Management operations and planning to include the increased risks resulting from climate change, including a capacity assessment and assessment of single-points-of-failure in the emergency response capability during cascading and compounding events

Action 9.3.4 - Prepare for cascading and compounding events by conducting a capacity assessment and assessment of single points of failure in the response capability of the County's Office of Homeland Security and Emergency Management

Action 9.3.5 - Develop, test, and regularly update emergency response and business continuity plans

Action 9.3.6 - Establish "Resiliency Hubs" with emergency solar charging stations, micro-grids to ensure power, potable water supplies, etc

Action 9.3.7 - Develop a 'Resilience Package' and conduct Resilience Audits, similar to the Energy Audits, to help residents and landlords identify reduce risk of climate impacts in and around homes

Action 9.3.8 - Work with Montgomery County Public School to rehabilitate schools for resilience; identify schools that can be used as emergency centers

Strategy 9.4 - Revise county codes, operations, and services to incorporate consideration of impacts of climate change

Action 9.4.1 - Break the silos between County departments that inhibit achieving adaptation, carbon sequestration, and greenhouse gas mitigation goals. Develop procedures to encourage (and enforce) collaboration between departments to maximize

achievement of county goals and to avoid unintended consequences; notably: between Agricultural Services, Environmental Protection, Permitting Services, Emergency Management and Homeland Security, Health and Human Services, Housing and Community Affairs, Transportation, and others

Action 9.4.2 - Upgrade design of critical facilities and emergency centers by adopting building codes that are higher than basic international building codes, considering strong winds, higher temperatures, frequent power disruptions, etc. (Consider designs for the 500-year storm, water supplies, multiple power feeds from separate substations; on-site renewable generation, design elements for habitability without electricity, etc.)

Action 9.4.3 - Place a moratorium on waivers for tree cutting and for stormwater controls and avoid taking actions that might frustrate achievement of the County's adaptation goals until the climate consultant's report is presented and acted on by the County Council

Action 9.4.4 - Review building code provisions for strictness of code provisions on wind, runoff, etc. For example, roof straps for high wind in higher buildings. Standards for wind resistance for solar panels, runoff from solar roofs, etc. Review inspection and enforcement mechanisms and resources allocated to meet building code standards

Action 9.4.5 - Review County budgets for repair of infrastructure, removal of downed trees, snow management; as well as storm damage to waterways, parks and trails, and campgrounds

Action 9.4.6 - Work with the private insurance industry to develop practices and products that help homeowners and businesses mitigate risk of damage from storms

Action 9.4.7 - Address County staff shortages for programs such as Rainscapes and tree planting by engaging volunteers and promoting messages of empowerment, e.g., "we can do this!"

Strategy 9.5 - Update Data, information, and monitoring to inform risk assessments

GIS

Action 9.5.1 - *Develop GIS data layers on demographics and vulnerable populations (elderly/nursing homes, economically depressed, animal shelters, etc.); integrate with watersheds, impervious cover, and other environmental data. Incorporate State of MD sea level rise and storm surge projections into County GIS systems and data layers

Action 9.5.2 - Ensure that GIS tools and data layers are available and shared across county agencies and available to residents as appropriate

Action 9.5.3 - Develop a risk rating scale; and identify vulnerable populations, critical facilities, high-value areas, and high-risk areas to prioritize for adaptation implementation

Flood Risk

Action 9.5.4 - Deploy more rain and stream gages throughout the county to build a more accurate observational ability to monitor changes over time. (dup)

Action 9.5.5 - Update County floodplain maps to the 30-acre watershed. (dup).

Action 9.5.6 - Conduct a citizen survey on home flooding events to identify hotspots; Overlay with GIS layers including land cover change; evaluate over time considering changes in precipitation, storm water flow, and other anomalies. (dup)

Action 9.5.7 - Work with NOAA National Weather Service to revise Maryland's IDF precipitation statistics. (dup)

Heat Risk

Action 9.5.8 - Deploy sensors or other methods to monitor heat risk. (dup)

Action 9.5.9 - Develop maps of heat risk. (dup)

Wind Risk

Action 9.5.10 - Develop county-wide wind gust mapping

Public Engagement Workgroup:

Continuous Improvement, Institutionalization, and Accountability

Goal 1: Government capacity - Develop county leadership, staff, organization and fiscal capacity to implement government-wide climate action programs across all departments and agencies

Strategy 1.1 - Evaluate current government culture, structure, assets and support systems to develop interventions that will ensure successful implementation of the Climate Action Plan

Action 1.1.1 - Conduct assessment of readiness for, and capacity to, change through interviews and opportunity mapping with elected officials, employees, and board/commission appointees

Action 1.1.2 - Inventory programs, policies, regulations and incentives to identify barriers to achieving climate goals

Action 1.1.3 - Use assessment results from 1.1.1 and 1.1.2 to establish baseline and metrics for improved performance and accountability, and to develop training plan to address deficiencies

Action 1.1.4 - Establish cross-departmental "Innovation Lab" in which employees from multiple departments meet quarterly with the County Executive and technical experts to develop, fund and implement systemic and leveraged cross-departmental climate and resiliency initiatives

Strategy 1.2 - Establish working groups to implement the CARP

Action 1.2.1 - Create departmental teams with responsibility for greening day-to-day operations and reorienting programs and services around climate change and resiliency

Action 1.2.2 - Establish cross-departmental communication teams with responsibility for integrating messaging and outreach

Strategy 1.3 - Build workforce capacity for change and leadership

Action 1.3.1 - Establish staff leadership development program for "climate champions," including incentives and recognition, and empower them to implement the goals of the Work Green initiative

Action 1.3.2 - Incorporate information about climate change and the CAP into OHR resources and practices, including new staff orientations, job descriptions, performance reviews and on-going training

Action 1.3.3 - Establish County Executive "Climate Awards" recognizing impactful program initiatives, County staff members who proactively breaks down silos seeking integrated, cross-departmental solutions, etc

Action 1.3.4 - Building on the County's Live Well and fledgling Work Green programs, initiate cross-departmental "tours" to showcase climate change initiatives occurring in all sectors and departments/agencies

Action 1.3.5 - Establish a "Climate Change Academy" to train County staff and elected officials, as well as the community at large, and host expert speakers through regularly scheduled climate forum

Action 1.3.6 - Create and/or reclassify positions in key departments (e.g., Procurement, OMB, Finance, IGR, HHS, PIO, Libraries, etc.) to focus exclusively on climate change solutions

Goal 2: Partnerships and Stakeholders - Build and institutionalize community and State jurisdictional partnerships to generate a critical mass of stakeholder support, and to foster collaboration, collective action, and equitable implementation

Strategy 2.1 - Identify stakeholder concerns and possible co-benefits to climate action by inviting input and incorporating feedback from stakeholders

Action 2.1.1 - Invite on-going input from stakeholders through a variety of means (e.g., internet, town halls, meetings, etc.), and demonstrate responsiveness to feedback received

Action 2.1.2 - Convene a People's Climate Assembly chosen to represent a cross section of county residents to recommend policies to be incorporated in the Climate Action and Resilience Plan (CARP)

Strategy 2.2 - Communicate status and results of CAP to the public and other stakeholders

Action 2.2.1 - Establish "Climate Dashboard" for real-time monitoring, and report annually on CAP showing progress against identified performance metrics and milestones

Action 2.2.2 - Incorporate visible, symbolic statements of commitment and support in public buildings, websites, signage, etc

Strategy 2.3 - Develop coalition of civic and business leaders to ensure ongoing communication between the County and the community

Action 2.3.1 - Establish a "Quality of Life" citizen board composed of a broad coalition of residents, businesses and civic leaders to advise the County Council and Executive on implementation of the climate action plan, and to ensure that the CAP is anchored and informed by basic human needs

Action 2.3.2 - Establish an MCPS workgroup on climate change composed of parents, students, teachers, principals and administrators, with participation by MCPS facilities, nutrition services, curriculum, and PTA

Action 2.3.3 - Establish citizen commission to develop and annually administer a Climate Leaders Award program for business and civic leaders and organizations

Strategy 2.4 - Stimulate “social entrepreneurism” by establishing a grant program to support community-based innovations to address the County’s climate goals

Action 2.4.1 - Partner with organization like Ashoka: Innovators for the Public to launch competitive grant program focused on innovative climate change initiatives managed and implemented by community-based organizations and networks

Strategy 2.5 - Build collaborative support among other MD jurisdictions to address ambitious climate change policies at the State level

Action 2.5.1 - Establish a statewide coalition of local governments focused on aggressive state climate policy by collectively advocating their positions before the state legislature, Public Services Commission and the utility companies

Goal 3: Government Leverage Points - Integrate climate awareness and action into County decision making, policies and institutional culture

Strategy 3.1 - Incorporate consideration of GHG emissions into the budgeting, finance and procurement processes

Action 3.1.1 - The Department of Procurement should establish an environmentally preferable purchasing policy and green specifications for RFPs, and establish and manage a procurement incentive program for green products, services and business operations

Action 3.1.2 - OMB should incorporate climate considerations into the budgeting process as a management and governance tool, drawing on already existing tools and methodologies (e.g., Climate Budget Tagging, internal carbon taxes, carbon budget, etc.)

Action 3.1.3 - Develop a "climate impact statement" requirement for pending bills, budgets, plans, and land use decisions over a de minimums amount

Action 3.1.4 - Require Department Directors, as part of their annual reports on their implementation of Countywide environmental policies, to include continuous improvement plans

Action 3.1.5 - Establish a working group of economic and financial experts to develop strategies to best finance the expected climate action agenda

Goal 4: Economic development - Strategically integrate economic development and climate goals to advance both

Strategy 4.1 - Encourage green business entrepreneurism, innovation and investment

Action 4.1.1 - Implement the most compelling recommendations from the County’s 2010 Green Economy Task Force Recommendations, including the creation of a "Green Enterprise Investment Board" to stimulate clean energy innovation

Action 4.1.2 - Establish "Green Business Demonstration" program to support locally based “eco-entrepreneurs" launching new green products and services so that businesses

can test and showcase their innovations using County assets/infrastructure and staff support to demonstrate proof of concept and accelerate market adoption

Action 4.1.3 - Establish a County investment portal that lists local green startups and growing businesses that provide products and/or services addressing climate change, and promote communitywide investment tools for local investing (e.g., donation crowdfunding, peer lending, self-directed IRAs, etc

Action 4.1.4 - Utilize Opportunity and Inclusionary zoning codes to incentivize the development and expansion of green locally-owned retailers catering to local consumer demands for green products and services

Action 4.1.5 - Explore the convergence of climate change and the life sciences with a Montgomery County-hosted national Climate/BioHealth conference. In addition to relevant biohealth cluster companies, include researchers from NOAA, NASA, NIH, Dept of Ag, etc., as well as local academic institutions

Action 4.1.6 - MCEDC should partner with the Federal Labs Consortium to create a product development accelerator focused on the commercialization of energy and water technologies being created in federal labs

Strategy 4.2 - Promote the production and sale of local products and services

Action 4.2.1 - Conduct leakage analysis to determine what goods and services, currently being imported, can be provided locally to reduce emissions and build self-sufficiency and resiliency

Action 4.2.2 - Amplify the MoCo made initiative through more financial support and procurement incentives

Action 4.2.3 - Work with MCEDC to create a B2B pilot project to increase local purchases made by medium and large businesses and anchor institutions

Action 4.2.4 - Promote and support "victory gardens" to increase local production of fruit and vegetables and reduce emissions associated with the transportation of food

Strategy 4.3 - Aggressively promote businesses that embed social and environmental practices into their day-to-day operations

Action 4.3.1 - Actively promote a “Best for DMV” campaign to encourage local businesses in the metropolitan area to measure their environmental and social impact and pursue B Lab certification

Action 4.3.2 - Provide funding to the local community greens to establish a “carrot mob” program that supports businesses that both green their operations and offer residents and businesses green products and services

Goal 5: Unions, Labor and Jobs - Partner with unions and businesses to advance climate goals, identify clean energy job opportunities and facilitate a just transition to a fossil-free economy

Strategy 5.1 - County management, labor and environmental organizations should embrace the collaborative concept of *Bargaining for the Common Good* to advance climate goals that benefit both union members and the wider community

Action 5.1.1 - Increase teleworking and compressed and flexible work schedules, and provide training to ensure that productivity and accountability are maintained

Action 5.1.2 - Encourage and facilitate county employees in the selection of environmentally/socially friendly investments in their self-directed retirement accounts, and provide education and training to actively encourage and assist employees in greening their retirement portfolios.

Action 5.1.3 - Change County and agency procurement guidelines to favor low-carbon, high-safety products (e.g., paint, carpeting, furniture, cleaning supplies and local/organic food) and practices (e.g., lawn mowing, cleaning services, etc.)

Strategy 5.2 - Proactively consider both economic opportunities and the adverse impacts associated with the transition to a carbon free economy

Action 5.2.1 - Conduct an inventory of existing green jobs, an analysis of green job growth potential, as well as expected job loss and reduction

Action 5.2.2 - The County should provide job guarantees for County employees, as well as re-training for private sector employees whose jobs become unnecessary in a carbon-free economy

<u>Evidence-Based Communications & Behavior Change</u>

Recommendation 1: Increase and stimulate internal climate action communications across County divisions.

Action 1.1 - County should host an internal government kick off climate change meeting to elevate the issue and demonstrate it's a county government priority that all agencies should support.

a. ALL divisions should participate. https://montgomerycountymd.gov/government/orgchart.html

Action 1.2 - County should integrate climate change messages throughout the government to change internal behaviors and decisions.

Action 1.3 - Any legislation from county council should align and prioritize the work of the workgroups.

Action 1.4 - Establish an interagency climate change group with leadership from each division and comm leads; meet quarterly.

b. Emphasize communication methods with this group.

c. Each division share activities and communication strategies.

Recommendation 2: Showcase county's climate action activities and commitment via external communications

Action 2.1 - County should institutionalize a steady drumbeat of outreach from EVERY division.

Action 2.2 - Communicate county's progress in implementing climate action recommendations (Data & Results).

Action 2.3 - Integrate climate change messages into county outreach.

a. Bottom of traffic tickets: "Did you know slowing down by 5 miles an hour …"

b. On buses: "Taking public transit rather than driving alone in your car reduces carbon…"

Action 2.3 - Include climate change connection messages when there are emergency events.

c. When emergency happens (flooding, storms); issue news release to show the climate change connection is communicated and highlight urgency of action.

Action 2.4 - As county implements emission reducing activities, publicize examples for community. Examples:

d. Improving building insulation.

e. Eliminating plastic water bottles at events.

Recommendation 3: Develop and Use Evidence-based Communication Messages

Action 3.1 - Based on communication theory and effective practices, create a communication message box of core messages that should be shared in ALL external communications.

Action 3.2 - Create Communication Process flow (slide 19). The process flow will help to determine which recommendations will be highlighted in the campaign and determine:

a. Is internal (government) or external (community)?

b. Will have immediate and measurable impact (only support and promote activities with immediate carbon reduction impacts)?

c. Are there impacts and accounts for disadvantaged and vulnerable populations and provides equitable approaches?

Action 3.3 - Core Messages include: Health, Local, Urgency, Legacy, and Economics. "Your health and our community will benefit from these changes!"

Action 3.4 - Establish additional core messages relevant to each County division.

Action 3.5 - Provide regular trainings on communications research and behavior change related to climate change for government communications officers.

Recommendation 4: Prioritize communicating climate change solutions that require and benefit most from public stakeholder engagement and support.

Action 4.1 - Prioritize what benefits most from public engagement (using resources wisely).

Action 4.2 - Use the process flow to determine what actions are promoted in the campaign.

Recommendation 5: Engage and facilitate action through ongoing external stakeholder actions (meet residents where they are)

Action 5.1 - Implement broad public relations campaign to encourage stakeholder engagement that supports broader and more significant urgent county changes.

Action 5.2 - Form a standing Climate Change Communication Commission or Committee of Climate Change Ambassadors from the community.

a. Create an ambassador model (e.g., trusted messengers) to encourage engagement and behavior changes. Peer-to-peer sharing leads to behavior change.

b. Provide compelling and useful tools (e.g., campaign like Green Initiative (GI) or "Healthy Green Community" that would brand everything together).

   i. Create behavior checklist.

   ii. Give A Shift YouTube: https://www.youtube.com/channel/UCV3GlZazdyO8SlKgDbF5H1Q

c. Include community leaders, ambassadors, and other public figures in outreach efforts.

d. Use humor when and where possible.

Action 5.3 - Develop and implement business outreach strategy.

e. Good for business

f. County "green seal of approval" stickers

Action 5.4 - Develop and implement strategies for various stakeholder groups.

g. Health

h. Education

i. Civic Groups

j. Faith-based

k. … and more

Recommendation 6: Engage community as partners and support their needs so they will take action on a personal level and support Montgomery County activities.

Action 6.1 - Make the community feel seen, heard, and valued by placing humans and human needs at the center of the communication work.

Action 6.2 - Move away from extracting information from people to inform the plan and bring people in as partners so they contribute to and are a part of the plan.

Action 6.3 - "Implementation partners" could be youth (receiving SSL hours or college credit for their work), faith communities (receiving small grant), etc. – some "compensation" that shows value for time and commitment.

Action 6.4 - What do you need? … and what climate action will help address that need. (focus on listening rather than telling so that people can see themselves in it).

Action 6.5 - Use the volunteer ambassadors to facilitate the dialogue in neighborhoods.

<u>Racial Equity & Social Vulnerability/Community Partnerships</u>

Goal 1 -- Incorporate input and feedback for the Climate Action Plan from key stakeholders and community members representing underserved communities and communities of color.

Strategy 1.1. -- Develop an inclusive process with key stakeholders and equity leaders to solicit input from underserved communities in 2020 leading up to finalizing the Climate Action Plan, building on work achieving in creating Racial Justice policy.

Action 1.1.1 -- Evolve the Climate Action Plan as a living document with ongoing feedback and leadership from equity stakeholders.

Action 1.1.2 -- Reach out to partners effectively engaged in racial justice Community Conversations as a starting point for planning. Meet equity partners, community members and faith leaders where they're at by engaging where communities already gather and interact to seek input.

Action 1.1.3 -- Deepen existing trusted partnerships between County and communities and build new ones that will help promote equitable outcomes for County climate actions. Be meaningful & thoughtful in these engagement efforts -- not just focusing on communities who are receptive, but providing capacity, resources, and support for a thoughtful process to include communities who are more difficult to reach/have barriers to participation.

Strategy 1.2 -- Develop draft framework for holding Climate Justice Community Conversations through partnership and inclusive design with equity partners.

Action 1.2.1 -- Establish clearly at launch of Climate Action Plan what aspects of the plan target County-led systems change to benefit MoCo communities and government, versus what aspects target individual responsibility.

Action 1.2.2 -- Engage directly with health initiatives including Latino Health Initiative and African-American Health Initiative, and County Advisory Boards such as African-American Advisory Board, Muslim Advisory Board.

Action 1.2.3 -- Ensure that leaders are engaged from MoCo's immigrant communities and met where they're at in their networks - African Diaspora, El Salvadorian community members for example. Take into account the heightened fear within immigrant communities around visibility and civic participation in the current federal era.

Action 1.2.4 -- Identify key stakeholders to include from these advisory boards, non-profits, civic associations, faith organizations, health initiatives / hospital / medical associations, and small business communities. Work closely with immigrant communities to not only seek their partnership on this work as residents, but to embed a lens of our global community and how the global impacts of the climate crisis affect our residents' families and other places in the world they call home.

Goal 2 -- Incorporate input and feedback for the Climate Action Plan from key stakeholders and community members representing underserved communities, communities of color & immigrant communities along with other key communities.

Strategy 2.1 -- Build on inclusive process and deep partnership work particularly with underserved communities, and educate County residents on how equitable outcomes will benefit all, while engaging communities in different ways based on needs, access, and opportunities.

Action 2.1.1 -- First, finalize framework and identify how Climate Justice Conversations will happen, especially at schools. Each conversation will need its own planning and deep community partnership. Figure out how many conversations, how many areas to go to, and an outline of what each conversation will seek to achieve.

Action 2.1.2 -- Hold Climate Justice Community Conversations to educate and engage the public on the intersections of energy equity and racial equity and deep learning on the County's Climate Action Plan and how it will benefit residents, choosing locations and times that are preferred by stakeholder partners representing underserved communities.

Strategy 2.2 -- Identify the most effective methods and tools for two-way, inclusive communication with stakeholders that is equitable and maximizes inclusion of vulnerable populations.

Action 2.2.1 -- Plan to engage community to talk with each other, not be talked at. When meeting people where they're at, consider opportunities to do so in deep connection with what already matters to them. For example, the Latino Health Initiative partnered with Corazon Latino for forest bathing walks for their volunteers, many of whom come from growing up in rural Central America with deep connection to the land. These experiences were deeply meaningful for participants and sparked emotional conversations.

Action 2.2.3 -- Perform a communication and technology needs assessment.

Strategy 2.3 --Increase countywide education on intersectional issues around climate and racial equity (longer term process).

Action 2.3.1 -- Modify guide developed for racial equity Community Conversations and use in this process. Following OLO recommendations, use the same set of prompts and require the collection of participant demographic data to generate more meaningful data to inform future County actions and decision-making.

Action 2.3.2 -- Create OLO report from Community Conversations and meetings with equity partners. Workshop Climate Action Plan with Office of Racial Equity and other stakeholders and update based on this feedback.

Goal 3 -- Provide Office of Racial Equity with sufficient budget, staffing & training to provide continuous input, coordination and guidance on equitable process and outcomes as Climate Plan is fully developed, implemented, and iterated on.

Strategy 3.1 -- Increase staffing of racial equity office to enough FTE to support the deep equity engagement needed for ongoing improvements to and equitable implementation of the Climate Action Plan.

Action 3.1.1 -- Address in 2020 how Montgomery County Government can adequately fund the Racial Equity Office to grow beyond planned addition of 1 FTE in summer, and add capacity for in-depth engagement around key intersectional issues such as housing, health, education, and criminal justice reform. Continue on a trajectory over mid & long-

term towards continued increases in capacity for this office if the County wants to truly commit to deep equity work and better serving all residents.

Action 3.1.2 -- Provide capacity through this office for coordination of Advisory Board, ongoing engagement in resiliency/vulnerability study, development with consultants of framework for Climate Justice Conversations, and equity engagement with proposed Climate Action Network / neighborhood ambassadors.

Action 3.1.3 -- Expand Advisory Committee by one position for an environmental justice / energy justice focused expert.

Goal 4 -- Provide context and support for Racial Equity & Social Justice Office to incorporate climate & energy justice into intersectional training curriculum for all County Employees, including Montgomery County Public Schools, M-NCPPC, and Montgomery County Police Department staff, which trains on racial justice, climate & energy justice, and economic justice.

Strategy 4.1 -- Modify existing and planned equity-related training program including Culture of Equity Training under direction of Office of Racial Equity, with community partner participation and feedback as helpful, building on Community Conversations on Racial Justice. Provide Racial Equity & Social Justice Office with any additional training and resources needed for modification.

Action 4.1.1 -- Incorporate fundamental elements of climate & energy justice into racial equity trainings so that trainees explore issues for county residents from an intersectional lens. Include comprehensive economic issues impacting cost of living, access to nutritious food and healthcare, and quality of life. Energy issues to include: Pollution & disproportionate health impacts on lower income communities, energy burden from utility bill costs, barriers to access clean energy

Action 4.1.2 -- Provide training to Racial Equity Social Justice Office, Advisory Committee members and other Advisory Board Members under County representing different communities.

Strategy 4.2 -- Pilot training program to learn from results and iterate and improve. Evaluate the County's current training requirements for employees and assess how to support employees having the capacity to engage in equity training on a deeper level.

Action 4.2.1 -- Select pilot program trainees from each County department/program (including police, MCPS, and M-NCPPC) for a diversity of trainee work areas. Engage Employee County equity experts as funded trainers where possible. Seek continuous feedback from trainees and equity partners. Assess trainees' evaluation of how equity training has impacted their work for the county. Report on results. Seek out opportunities to use existing County wellness programs with group challenges for climate action in a way that supports equitable outcomes.

Goal 5 -- Ensure the HHS Minority Health Initiatives have additional budget, staffing, and training for expansion of (1) core functions linked to health equity, (2) emerging functions linked to climate adaptation/resiliency programming and climate/health communication (including health risks of climate change, health equity benefits of climate action), (3) meaningful collaborations with community/advocacy groups (including those that work against displacement and policing/incarceration/detention/deportation of communities of color and immigrant communities, which also represent public health threats), and (4) capacity to provide continuous input, coordination and guidance on equitable process and outcomes as Climate Plan is fully developed, implemented, and iterated on.

Strategy 5.1 -- Complement the community-based vulnerability/resiliency assessment and metrics outreach processes with ongoing engagement with HHS minority health initiatives (African American Health Program, Latino Health Initiative, Asian American Health Initiative), the communities they serve, and community/advocacy groups regarding climate vulnerability/resiliency through the lenses of health equity, racial justice, and (im)migrant justice.

Goal 6 -- Define equity long-term goals and near-term targets for county residents and incorporate goals into Climate Action Plan.

Strategy 6.1 -- Integrate climate equity objectives into Racial Equity Impact Assessments for legislation passed by the Council & Racial Equity Action Plans for County Departments.

> Action 6.1.1 -- Incorporate energy equity metrics, health equity metrics, and intersectional approach to assessments that will assist in review and analysis of legislative impact. Develop methodology for scoring proposed legislation on intersectional equity issues.
>
> Action 6.1.2 -- Identify key initiatives that will improve access and outcomes for employment, housing, education, transportation, and other policy areas which factor into residents' ability to engage with climate initiatives and create assessment methodology to interlink achievements in these areas with reaching climate objectives.
>
> Action 6.1.3 -- Drawing from surveying & research assessing county residents together with utility data, define energy burden and other energy equity criteria as metrics to be measured for impact for proposed & enacted legislation.

Goal 7 -- Develop Community Climate Action Network with integrated champion / ambassador / block captain program to sustain community outreach and engagement. (This is not a prescriptive idea, but rather an opportunity for the County to develop a structure for ongoing community engagement, which could be supported by a non-profit with funding rather than the County itself.) Another idea for network title - Community Climate Action & Racial Equity" (Community CARE) Network to highlight equity as central.

Strategy 7.1 -- Build online / offline communication network bringing together stakeholders from all County communities, including government, residents and civic associations, youth & students, business, faith, civic action, and more to sustain key relationships with community connectors for continuous feedback and participation from a critical mass of residents.

> Action 7.1.1 -- Build on existing networks from County Office of Partnerships and proposed stakeholders from climate workgroups (to be provided as supplemental info). Survey stakeholders/communities on how they want to be engaged through this network. Build a discussion listserv and resource its maintenance by county staff.
>
> Action 7.1.2 -- Tap into existing email list from DEP to disseminate climate action plan e-blasts. Create standing advisory committee representing a diverse set of community stakeholders with a county staff coordinator. Resource multi-channel communications for multiple languages.

Strategy 7.2 -- Design impactful program to train & support community members as ambassadors for climate action plan. Build program with equity goals such that champions in underserved communities are supported to help their community members benefit and gain resources, while champions in communities with more resources are supported to help community members contribute and do their part.

> Action 7.2.1 -- Engage equity partners in initial design and planning of block captain program and test pilots in differing communities.
>
> Action 7.2.2 -- Draw from existing resources from organizations like Climate Reality Project, and link in to community action network built for outreach on climate action plan.
>
> Action 7.2.3 -- Support representation of champions at community events and meetings of all kinds to deepen the connection with climate action, through a health lens as recommended by this climate workgroup.
>
> Action 7.2.4 -- Pair champions from environmentally-focused groups with champions from other types of groups as "sister" ambassador method to learn from each other.

Goal 8 -- Identify areas of overlap and potential for partnerships between all jurisdictions within and outside Montgomery County to maximize effectiveness and leverage programs, methods, messaging, etc.

Strategy 8.1 -- Promote, encourage, and assist in the development of climate action plans by jurisdictions within and outside Montgomery County;

> Action 8.1.1 -- Identify and utilize existing connections and partnerships between jurisdictions.
>
> Action 8.1.2 -- Create annual summit or conference for sharing of ideas, best management practices, form partnerships and workgroups etc.

Goal 9 -- Reform development process in Montgomery County for real accountability about how planning & zoning impacts environment and community health, and for sustainable outcomes that promote real community engagement & power, real systems change, and improved environmental & health outcomes.

Strategy 9.1 -- Developers have significant power in the zoning process. Address why development in the County benefits developers over communities and reform the community engagement progress and laws around zoning & planning for a more sustainable County that protects community health and where communities have real power in the planning process.

> Action 9.1.1 -- Educate the planning department around climate, energy, & health equity issues from an intersectional lens. Define longer-term goals. Form a workgroup around this topic which is far too large to cover as part of another workgroup, and resource community members to participate with stipends, transportation, childcare, food
>
> Action 9.1.2 -- Embed climate, energy, health equity into the planning and zoning process and address development that has driven negative environmental & health impacts.

Goal 10 -- When creating climate champions / ambassadors in the Climate Action Network (characterized above), create dedicated "spheres"/initiatives for sharing expertise.

Strategy 10.1 -- Establish a program of local researchers and practitioners/professionals speaking at and creating interactive toolkits (in collaboration with formal or informal educators) for schools, colleges, universities, and informal education programs (e.g., afterschool programs, summer camps, nature centers). Place a special emphasis on encouraging participation of researchers and practitioners who are not formally in a "climate space" to explore connections between their work and climate issues, particularly climate justice.

> Action 10.1.1 -- Promote climate-focused participation in existing programs like "Skype a Scientist" that can bridge (a) international expertise/innovation with MoCo educational settings and (b) MoCo expertise with educational settings throughout the world (e.g., in "sister jurisdictions").
>
> Action 10.1.2 -- To address concerns that MCPS teachers don't feel equipped or have room in the curriculum to devote to climate change,develop mechanism to bring climate-focused education into the classroom from resources outside of MCPS and/or champion the addition of climate change topics to the school curriculum.

Goal 11 -- Connect with students, faculty, and/or researchers in Montgomery College and local universities (both in and near Montgomery County) to co-lead climate efforts, in partnership with community groups, businesses, faith groups, government agencies, etc. Encourage transdisciplinary, cross-sectoral collaborations and knowledge-sharing/data-sharing with communities.

Strategy 11.1 -- Create a climate internship program as a pipeline for students.

Action 11.1.1 -- Emphasize inclusive recruitment, such as among students from communities of color, from immigrant communities, from low-income communities, with disabilities, and who were previously incarcerated or who otherwise face discrimination due to the criminal justice system.

Action 11.1.2 -- Increase accessibility by providing additional mentorship or sufficient funding for students who need it to participate fully. Ensure that funding mechanisms are not exclusionary (for example, to not mirror how many funding sources exclude students who are undocumented).

Action 11.1.3 -- Create climate cohorts where students periodically meet and exchange.

Strategy 11.2 -- Launch community science programs to increase both capacity and interest in data collection/analysis relating to climate action or climate impacts. [Terminology note: "Community science" is meant to be similar to "citizen science", but using less exclusionary wording.]

Action 11.2.1 -- These community science initiatives can involve synergies/coordination with the efforts about co-producing and tracking climate, energy, health equity metrics.

Strategy 11.3 -- Establish a program of local researchers and practitioners/professionals speaking at and creating interactive toolkits (in collaboration with formal or informal educators) for schools, colleges, universities, and informal education programs (e.g., afterschool programs, summer camps, nature centers).

Action 11.3.1 -- Place a special emphasis on encouraging participation of researchers and practitioners who are not formally in a "climate space" to explore connections between their work and climate issues, particularly climate justice.

Action 11.3.2 -- To address concerns that MCPS teachers don’t feel equipped or have room in the curriculum to devote to climate change, develop mechanism to bring climate-focused education into the classroom from resources outside of MCPS and/or champion the addition of climate change topics to the school curriculum.

Action 11.3.3 -- Promote climate-focused participation in existing programs like "Skype a Scientist" that can bridge (a) international expertise/innovation with MoCo educational settings and (b) County expertise with educational settings throughout the world (e.g., in "sister jurisdictions").

Goal 12 -- Develop climate, energy, and health equity metrics and a data-driven assessment / reporting process.

Strategy 12.1 -- Groundtruth, prioritize, and periodically reassess metrics for climate, energy, and health equity (housing burden, energy burden, etc) in frontline communities.

Action 12.1.1 -- With a deep engagement process (possibly in collaboration with the Climate Justice Conversations, Community Climate Action Network, vulnerability/resiliency assessment, DHHS Minority Health Initiatives, etc) in

underserved communities, ground-truth and prioritize indicators for climate equity/health metrics. The metrics can include any relevant County-specific performance indicators in the Climate Action Plan, but also can include/highlight regional indicators (e.g., by using the MWCOG Healthy Places index that assesses social/place-based determinants of health, can propel regional cooperation around a health equity lens).

Action 12.1.2 -- Hold periodic community workshops (participation from agency representatives, community groups, individuals) to revisit the relevance of metrics to the local scale (i.e., where benefits/harms of the actions assessed via these metrics are most felt). At the same time, use these workshops to build community organizing capacity around, for example, using the metrics to assess and direct County investments in local amenities/services.

Action 12.1.3 -- After each County-wide series of metrics-focused workshops, (a) assess the extent to which these metrics are standardized/comparable across the County scale, (b) collect/provide recommendations for how to ensure more consistent measurement/reporting, and (c) share summaries of the workshops (e.g., highlighting themes/success stories/challenges that specific to particular communities, as well as those that are shared across communities).

Action 12.1.4 -- While a standardized collection of County-wide metrics is necessary, also determine how to elevate particular metrics that are preferred at local scales. "Weight" different metrics for different communities to reflect their different priorities/needs/realities, e.g., determine how to represent this weighting in dashboards/GIS maps (incorporated in actions below) and operationalize it into decision-making criteria.

Strategy 12.2 -- For climate health/equity metrics that require additional data-collection, co-produce shared tools for assessing/surveying with frontline communities and partners (e.g., agency support staff, universities, community groups).

Action 12.2.1 -- Co-produce and pilot-test survey questions. Ensure translation into multiple languages.

Action 12.2.2 -- Build capacity (e.g., via funding and training) for communities to administer these survey tools. This can be in conjunction with building up participation in the integrated champion / ambassador / block program.

Action 12.2.3 -- Design follow-up into the surveying process that gives participants a clear understanding of how their participation impacted outcomes, and how it impacts their individual life and the lives of their families and local communities, and gives participants a sense of meaning and relationship.

Strategy 12.3 -- Present metric-based results/analysis in digital platforms and workshops.

Action 12.3.1 -- Present results in a regularly-updated climate health/equity dashboard, regularly-updated interactive maps (GIS decision-support tools/datasets), compelling

StoryMaps that elevate community voices and narrative co-creation, and in workshops to participating communities (in locations that are convenient and familiar for them), partner agencies/organizations, the Community Climate Action Network, and decision-makers.

Strategy 12.4 -- Build capacity for how to leverage the metric-based results/analysis in community advocacy/organizing.

Action 12.4.1 -- Provide training/technical support (e.g., data analysis) that enables community members to use the results to advocate for equitable distribution of resources/amenities/opportunities.

Action 12.4.2 -- Continue to facilitate strong relationship-building and communication channels throughout the Community Climate Action Network, so that this Network is always available to provide broader-scale support/amplification of the demands of frontline communities, regardless of whether the advocacy is based on analysis of climate/energy/health metrics or not (since the urgent realities of some communities will be underreported via metrics).

Action 12.4.3 -- Hold an annual "State of the Climate" address where results of past year reported. The focus is not just CO2 emissions, but community engagement and progress along the equity-focused metrics.

Strategy 12.5 -- Maintain public-facing, data-driven progress reports to promote understanding performance, metrics, and progress. Ensure these reports are accessible and user-friendly to provide maximum reach. Use interactive, digital dashboards (potentially introduced via gamified platforms or narrative StoryMaps, with links to in-depth datasets and GIS maps) to track performance via climate metrics and climate/energy/health equity metrics. Climate metrics across these dashboards are common to all agencies and offices in the County. Dashboards include the opportunity for public questions/comments, with the option to make feedback publicly-visible if individuals wish.

Action 12.5.1 -- Maintain a compendium of climate and climate/energy/health equity dashboards on CountyStat and keep datasets updated on data.Montgomery. These dashboards should include links to the programs/initiatives that are targeted as assessed via particular metrics. Equity dashboards should include acknowledgment of underreporting of marginalized communities, such as immigrant communities.

Action 12.5.2 -- Dedicate one dashboard to the County-scale status on GHG reduction against targets/goals, with a special emphasis on inviting public input. Make this visible on the main page of the County website, as well as in periodic coverage by County social media, Montgomery Community Media, and County spokespeople.

Action 12.5.3 -- Require each County department/agency to prominently display their climate dashboard on the main page of their website.

Action 12.5.4 -- Present annual reports (with infographic “report cards”) for how each government department/agency performs along metrics relating to climate

equity/health/mitigation/sequestration/resiliency, as applicable. Encourage voluntary participation from businesses and community groups in similarly reporting their progress.

Action 12.5.5 -- Use dashboard to also promote (a) transparency/accountability among government agencies and community partners, (b) engagement among individual community members, and (c) connections between larger-scale/structural actions (e.g., implementation of county-wide policies that were championed by particular agencies or community groups) and shifting trends in individual behaviors or well-being.

Action 12.5.6 -- Ensure that dashboards, Storymaps, reports, etc are translated into multiple languages.

Action 12.5.7 -- To ensure that key findings on digital platforms like dashboards are not prevented from reaching audiences that lack access to online media, collaborate with community groups, agencies, media outlets (e.g., radio stations) to ensure information accessibility via additional communication channels, community events, etc.

Action 12.5.8 -- Encourage widespread adoption of user-friendly carbon footprint tools (and other tools that promote behavior change) by creating capabilities for gamification and personalization, including among diverse audiences. To promote community engagement in linking “serious game” components to climate themes, crowdsource ideas and encourage pilot-testing from youth programs, individuals interested in creative writing / game design / art, etc.

Goal 13 -- Co-design and conduct a dedicated climate vulnerability/resiliency assessment that centers the visions/values/experiences of frontline communities.

Strategy 13.1 -- Form inclusive advisory board over the climate vulnerability/resiliency assessment process.

Action 13.1.1 -- Form a vulnerability/resiliency assessment advisory board that represents underserved communities via individuals and advocacy/community groups. Board members are provided with stipends, childcare, translation, and choices over meeting locations/platforms/timing. How it's implemented will determine if this is a process that works. Ensure that the frontline communities represented are not just county residents -- e.g., outdoor workers who live elsewhere in the DMV and who occasionally work in Montgomery County should also be represented.

Action 13.1.2 -- Design follow-up with Advisory Board into the surveying process that gives participants a clear understanding of how their participation impacted outcomes, and how it impacts their individual life and the lives of their families and local communities, and gives participants a sense of meaning and relationship.

Action 13.1.3 -- Explore with Advisory Board how they perceive the links between serving on the advisory board and the individual/family/communal impacts and move forward with their leadership on working with communities.

Action 13.1.4 -- Address how communities are continually both over-surveyed and underserved by closely partnering with community events/groups, being responsive to the type of participation that community members find comfortable/meaningful, and emphasizing County accountability. Fund art/music from members of the community as a highlight/aid to the visioning process, provide healthy food, and fund leadership/co-facilitation by trusted community groups that provide access to impactful resources and experiences at the events. In addition to designing the meaning-/relation-focused surveying follow-up (described in above recommendation), County staff should be immediately transparent about mechanisms for accountability in how the County government will use the results from this vulnerability/resiliency assessment to benefit communities/community members. Acknowledging the gaps in widespread community representation/participation (e.g., for immigrant communities who are experiencing substantial trauma from the government) that may be present in the assessment, County staff should also specifically talk with community members about how future feedback processes and delivery of benefits can be broadly meaningful to the community despite these gaps.

Strategy 13.2 -- Create locally-shared understandings of resiliency and values/principles/principles through a series of visioning workshops (also can be combined as part of community events that involve visioning for climate planning, broadly).

Action 13.2.1 -- Bring together community members around a "resilient and thriving future" (NACRP Community-Driven Climate Resilience Planning). Show mapping tools (e.g., MWCOG Equity Emphasis Areas maps, MD EJSCREEN, Montgomery County's Foodstat, CDC Social Vulnerability Index, National Environmental Public Health Tracking Network - Data Explorer, etc) -- as a brief springboard that acknowledges both the value/limitations of these approaches/frameworks. Explore root causes of climate change and structurally-maintained "vulnerability". Highlight examples of how resilience vision/values can drive climate planning, community organizing/advocacy, decision-making. Integrate personal stories into the collective vision that each workshop builds.

Action 13.2.2 -- Bridge visioning workshops with bringing frontline communities into additional assessment processes: prioritize metrics and co-create surveying tools (as described in other recommendations), identify community assets (not just based in infrastructure, but also in cultural/linguistic diversity, etc), identify threats from climate exposures (e.g., health-related) and climate planning (e.g., eco-gentrification) to further explore potential metrics/goals, map networks of local experts, conduct power mapping (as described in other recommendations), etc.

Action 13.2.3 -- Both during and after events, amplify visions through through art and media.

Action 13.2.4 -- Complement the community-based vulnerability/resiliency assessment and metrics outreach processes above with ongoing engagement with DHHS minority

health initiatives (African American Health Program, Latino Health Initiative, Asian American Health Initiative), the communities they serve, and community/advocacy groups regarding climate vulnerability/resiliency through the lenses of health equity, racial justice, and (im)migrant justice.

Goal 14 -- Identify visibility campaign to speak to vulnerable residents about MoCo values in a meaningful way that is part of an accountable process -- not just stating values but demonstrating what MoCo gov is doing to make county more inclusive & safer for vulnerable residents.

Strategy 14.1 -- Incorporate this work in community engagement & Advisory Committee efforts to determine a meaningful way to do this. Example: "Hate has no business here" Take into account that no amount of campaigning or information will fully counteract the negative impact of this current federal era that is driving fear and trauma in immigrant communities, communities of color, LGBTQ communities and other vulnerable residents. For example, the terror around citizenship on the census will lead to suppressed responses despite the question not appearing ultimately. Work with community partners on resonance and accessibility for different cultural communities, including translation.

Goal 15 -- Leverage public and private funds through traditional and innovative funding streams to secure funding necessary to ensure Montgomery County's Climate Action Plan is supported and fully implemented.

Strategy 15.1 -- Create a temporary workgroup comprised of agency representatives, local experts and community leaders on climate change to identify 1) existing public funding streams best suited for supporting the action plan goals, 2) innovative partnership structures that have worked in other communities for this purpose, and 3) philanthropic sources that can be approached for funding support.

Action 15.1.1 -- Identify funding sources in other recent county initiatives. Identify funding models in other similar jurisdictions around the country. Survey philanthropic sources. Consider opportunities through Innovation Fund; examine public/private funding sources focused on adaptation and resilience, which may hold co-benefits to multiple sectors. See: https://toolkit.climate.gov/content/funding-opportunities

Goal 16 -- For public funds, use and elevate direct procurement as an opportunity to distribute the benefits of climate action equitably, improve socioeconomic conditions, and expand coalitions for climate action.

Strategy 16.1 -- Ensure that equity goals are closely integrated with purchasing (processes, sources, and amounts).

Action 16.1.1 -- When framing/communicating equitable procurement approaches, highlight historical/systemic injustice (e.g., many years of inequitable procurement contributing to the racial wealth gap).

Action 16.1.2 -- Change rules and standards in climate-related contracts for more inclusive requirements. This could include setting numerical targets to increase well-paying jobs to people of color and people from other marginalized communities, such as people who experience discrimination due to previous incarceration or other contact with the criminal justice system. Ideally, the equity targets would be more comprehensive, to include workforce development plans. Those plans, which are associated with construction but applicable across sectors, ensure that residents "overcome any skill-based, informational, or other barriers to employment" (City Accelerator Guide: http://infrastructure.livingcities.org/essay/equity/).

Action 16.1.3 -- Partner with community organizations and their existing resources to ensure capacity-building resources for bidding on the contract and supporting resources (e.g., childcare, transportation assistance, and contractor assistance) are available to those who need them.

Action 16.1.4 -- Expand participation in Montgomery County's Minority, Female and Disabled-Owned Businesses Program (and similar programs specific to some departments) and the "Ready, Set, Grow" procurement workshops that co-hosted by Montgomery County and MD's Governor's Office of Small, Minority & Women Business Affairs.

Action 16.1.5 -- Focus outreach on small firms that have not previously or recently bid or been awarded contracts with the County government. For those previously-contracted firms who have not bid recently, work with partners that those firms trust to identify causes/solutions (e.g., to discern issues like the County not offering payment quickly enough to be feasible for participation of small businesses).

Action 16.1.6 -- As an expansion of offering capacity-building and supporting resources, create a dedicated Climate/Equity Mobilization Fund for upfront financing of firms for bidding/early stages of working on County projects.

Action 16.1.7 -- Identify champions on equitable procurement throughout County government (e.g., agencies/departments that have already have equitable procurement goals in their strategic plans). Encourage sharing of existing knowledge/best practices, as well as exploring synergies between climate-focused procurement (e.g., "greening" request-for-proposal specifications) and equitable procurement.

Action 16.1.8 -- To support both reporting and knowledge-sharing, maintain a dashboard of climate/equity procurement metrics and a repository of Montgomery County request-for-proposals that incorporate equity specifications (with annotations that make these specifications). This collection can be supplemented with additional examples like the US Employment Plan (https://jobstomoveamerica.org/resource/u-s-employment-plan/) as models that can be customized to Montgomery County across all sectors/departments.

Action 16.1.9 -- When offering incentives (e.g., renewable energy/energy efficiency incentives for existing buildings to make upgrades): (1) Pre-qualify particular firms that

align with equity goals (e.g., that are owned by women of color, that provide workers with well-paying wages and access to unions, that actively employ people who were previously incarcerated or who have other records from the criminal justice system). Aim to create a pool that is broader than the firms that have previously bid/won contracts or been a sub-contractor to the County government. Collaborate with other organizations on outreach, (2) Require private sector entities to contract from this pool of pre-qualified firms in order to receive the publicly-funded incentives.

Strategy 16.2 -- Leverage indirect procurement to ensure that private sector entities (e.g., buildings) complying with County ordinances/incentives will do so with equity goals.

Action 16.2.1 -- In cases where cannot mandate that private sector entities prioritize local, equity-aligned firms, ask to see the buying plan of the private sector entities, encourage consideration of equity-aligned firms, and provide capacity-building workshops to those firms to help prepare them for request-for-proposals. In the process, this may also build capacity for the firms to pursue larger proposals in the future.

Empowering & Engaging Youth Through Education

Goal 1: Community as a Resource: Develop increased opportunities for students to participate in climate change experiences outside the classroom

Strategy 1.1 - Encourage youth and their families to patronize businesses whose main goal is to reduce GHG emissions

Action 1.1.1 - Educate youth on businesses, whose main goal is to reduce GHG emissions, so they can patronize them

Action 1.1.2 - Reach out to businesses, whose main goal is to reduce GHG emissions, to promote internships for students

Action 1.1.3 - Montgomery College can join in the revitalization of the Green Business Certification approach that partnered the chamber and DEP and Montgomery College and provide a course to businesses - Intro to Environmental Awareness and Best Practices. Face to face and online synchronous

Strategy 1.2 - Develop climate change opportunities that engage students in climate discussions/activities

Action 1.2.1 - Promote lectures and round tables where students meet up with professionals and are able to receive guidance in different careers

Action 1.2.2 - Grow competitions that engage student in climate change action using arts and media: 3D Model, competitions environmental posters (SERT) , and environmental film competitions

Action 1.2.3 - Host a career camp for high school students in partnership with University of Maryland where they can meet professionals from different climate change related majors. It can be a week program or summer training

Strategy 1.3 - Partner with federal and local agencies, non-profits and other County departments

Action 1.3.1 - Provide a series of educational public forums and discussions, book clubs, lectures, hands-on programs and other activities at the 21 Montgomery County Public Libraries to bring awareness of the climate issue to all residents - youth, adults and families. Programming can be customized for all ages and provide residents with the tools to create practical and achievable action plans

Action 1.3.2 - Develop and deploy with Montgomery College an Intro to Environmental Awareness and Best Practices course that can be offered and can be taken to communities through libraries, schools, civic associations etc. and in open enrollment formats. Special efforts to reach vulnerable communities and less resourced communities

Goal 2: PK – 12 Formal Education: Develop increased opportunities for students to participate in climate change education and experiences in the classroom of private, public, and home school communities

Strategy 2.1 - Frame the conversations of adults/educators with students/children away from fear/worry about climate change, to how to empower students with knowledge about what climate change is, how it will impact them, and what they can do in their daily lives to assist

Action 2.1.1 - Facilitate family or parent-professional small group discussions at schools. Include an interpreter as needed

Action 2.1.2 - Engage Superintendent and Principals to advocate for more climate change education/engagement in schools

Action 2.1.3 - Incentivize teachers to engage in climate change education (professional development, projects, etc.)

Action 2.1.4 - Reach out to PTA to develop a climate change budget item

Strategy 2.2 - Develop the students' knowledge on climate change through new and already existing activities provided by the school

Action 2.2.2 - Build on school STEM nights, the county STEM festival, and the MD Green School Program to grow a green culture within each school to help inform and empower students about climate change

Action 2.2.3 - Develop an International Student Climate Change Summit that builds off the diversity of students in MCPS, where students present the results of investigations of the impact of human induced climate change on a selected country, including the USA with a focus on MD and Montgomery County. The conclusion would be student recommendations to MC and MD governments. The objective is to help students comprehend how climate change can be understood from a political point of view

Action 2.2.4 - Continue to support school Green Teams to motivate students to take small actions that will reduce GHG emissions (turning lights off, recycling, closing the faucet…). Do it regularly at school until it becomes a habit

Action 2.2.5 - Bring professionals, whose careers are related to climate change, to the STEM fairs and STEM festival

Action 2.2.6 - Integrate climate change into the curriculum of courses such as health and social studies

Action 2.2.7 - Montgomery College should sponsor events that bring in relevant speakers, panels, discussions to already existing and new lessons

Action 2.2.8 - AT MCPS, Environmental Science with a focus on human induced (environmental) climate change should be offered as a required course

Strategy 2.3 - Ensure that students have an opportunity through the science curriculum to analyze data and draw conclusions about climate science

Action 2.3.1 - Continually inform students on how information related to the environment and climate change is used over time, specifically how research has helped the environment. This will be a way to help students feel empowered

Action 2.3.2 - Collect data and evaluate the effectiveness of the programs related to the environment in schools and colleges. Evaluation can be done through surveys

Action 2.3.3 - Continue to teach children the critical thinking skills to read, analyze, and assess various claims they might encounter; help them have an informed conversation

Action 2.3.4 - Include environmental awareness in science courses, architecture courses, construction management, marketing and other courses offered by Montgomery College

Strategy 2.4 - Empower students to take action on environmental and climate issues

Action 2.4.1 - Provide professional development to teachers on US and MD climate policies and the processes students can utilize to have a voice

Action 2.4.2 - Motivate students to use their knowledge of how the government and policies work in order gain access and have input in the process. Assist students in using their environmental SSL requirement to voice their concerns/solutions, etc

Action 2.4.3 - Teach students about state laws and how they can participate in county and/or state policy making

Action 2.4.4 - Guide students on how to write letters to govt. officials and make public comments at meetings

Action 2.4.5 - Reach out to PTAs and develop a climate change budget (fund-raising based on selling green products -i.e. bamboo toothbrushes, bottles, metal straws-) to give as grants to students who have succeeded in demonstrating climate change action

Strategy 2.5 - Ensure that homeschooled families have access to climate change information and data

Action 2.5.1 - Investigate how MSDE is incorporating climate change knowledge into the homeschool curriculum

Action 2.5.2 - Provide to local homeschool groups opportunities for collaboration on events including field trips, volunteer opportunities, co-ops, academic enrichment opportunities, conventions on climate change, etc)

Strategy 2.6 - Ensure that private schools in the county have access to current climate change information and data

Action 2.6.1 - Compile a list of all private school primary contacts and send out a mass email about incorporating climate change into curricula, and about organizing events related to climate change

Action 2.6.2 - Propose climate change as a discussion item at open houses, since open houses occur somewhat regularly among private schools

Strategy 2.7 - Facilitate access by students to their schools' (public, private and homeschool) data on their environmental impact

Action 2.7.1 - Classroom teachers use information about their school's or home's footprint in teaching about human induced climate change

Action 2.7.2 - Make sure that the data about school's or home's footprint is discussed at school or household

Action 2.7.3 - Make sure that all classes and households have access to education on climate change

Goal 3: At home: encourage climate change education in the home setting

Strategy 3.1 - Practice sustainability at home from a young age for the child

Action 3.1.1 - Run w/ the child's specific interests in terms of climate change (for example, if they are interested in animals, introduce how climate change can affect biodiversity or change where they can live.)

Action 3.1.2 - Communicate with older kids about current events related to climate change and encourage them to share with families what they learned

Action 3.1.3 - Offer the sustainability material and information from school in different languages so that students can share the information with their parents and siblings

Goal 4: Incorporate climate change education in the students' everyday lives

Strategy 4.1 - Promote commitment among students to help reduce their carbon-footprint and learn about climate change

Action 4.1.1 - Incentivize students to carpool or use public transportation to go to school. This, as a result, will engage students that are not interested

Action 4.1.2 - Have an ambassador program for different age groups that will engage other students and will be a type of “liaison”

Action 4.1.3 - Offer small group discussions for ESL specific communities

Action 4.1.4 - Recruit Montgomery College students for proposed Environmental Ambassador program that would send students into communities to provide information and learn about their concerns and aspirations. (This could be a classroom assignment or an internship)

Goal 5: Incorporate climate change in extracurriculars

Strategy 5.1 - Allow students to learn about climate change outside of the regular classes

Action 5.1.1 - Integrating school gardens into curriculum as a means to learn about food, food waste, pollinators, and the impact of climate change of food worldwide

Action 5.1.2 - Assist coaches, clubs, summer camps, and scout troops with integrating climate change discussion or stewardship actions and will include kids from public, private, and home school

Transportation Workgroup

Electric and Alternative Vehicles

Personal EVs

Goal 1 - Minimize use of existing ICE vehicles via accelerated decommissioning

Strategy 1.1 - Provide compelling financial incentives to get rid of ICE vehicles

> Action 1.1.1 - Implement “Cash for Clunkers” (or "Junk the Jalopy", "EV Opportunity Grants", "EV Freedom Grants") program to encourage replacement ICE vehicles with priority given to older, less fuel-efficient vehicles; destroy the replaced ICE engines

Strategy 1.2 - Give special attention and incentives to financial considerations for low-income residents

> Action 1.2.1 - Provide low-income residents with higher incentives (e.g., $5K) to trade in older, higher polluting vehicles with ZEVs or for vouchers for public transit, car sharing, bike sharing, or electric bikes

Strategy 1.3 - Promote lower VMT of ICE cars by making driving ICE more expensive, taking into account equity concerns (with waivers that would be phased out over time)

> Action 1.3.1 - Institute Environmental Impact Fee on gasoline purchases
>
> Action 1.3.2 - De-prioritize road expansion, with the exception of expansion
>
> specifically for zero-carbon vehicles - transit, bikes, scooters, golf carts, etc.

Goal 2 - Decrease purchases of new and used ICE vehicles

Strategy 2.1 - Provide financial disincentives for purchase of high GHG-emitting vehicles

> Action 2.1.1 - Implement new, but differential, sales tax, registration fees, and/or Environmental Impact Fees
>
> Action 2.1.2 - Implement disincentives for fuel-inefficient cars such as revenue-neutral feebate programs (fee collected for less efficient vehicles used for rebate for more efficient vehicles)

Strategy 2.2 - Pass legislation, regulation, and/or ordinance discouraging or restricting sale and/or registration of ICE vehicles

> Action 2.2.1 - Require all commercial car sellers to meet increasing percentages of electric car sales
>
> Action 2.2.2 - Institute significant annual property tax or Environmental Impact Fee on ICE vehicles after 2027

Goal 3 - Speed transition to EVs by incentivizing EV purchases

Strategy 3.1 - Improve financing options and incentivize via financing

Action 3.1.1 - Finance L2 EVSE Installations into Car Payments

Action 3.1.2 - Establish Green Car Loans from the MoCo Green Bank, repaid

through savings obtained by driving an EV.

Strategy 3.2 - Eliminate or reduce county fees and/or taxes when purchasing EVs

Action 3.2.1 - "Feebate" county car fee/rebate for cars based on GHG or GHG proxy (MPG)

Action 3.2.2 - Provide tax credits/incentives for EV vehicle purchases

Strategy 3.3 - Provide & publicize non-financial perks to EV owners

Action 3.3.1 - Offer benefits to EV/ZEV drivers (HOV access, BRT lane access, priority parking, free municipal parking)

Action 3.3.2 - Adopt EV-friendly zoning and parking ordinances

Strategy 3.4 - Leverage potential partners (who stand to benefit financially with increased EV adoption) to incentivize purchases

Action 3.4.1 - Identify utilities and others who will financially benefit from increased adoption of EVs and partner with them to create incentives

Strategy 3.5 - Provide increased financial incentives for low income residents, especially those dependent on cars

Action 3.5.1 - Establish a county "EV Freedom" program, which gives income-qualified residents significant funds towards the purchase of an EV and ongoing consulation from an "EV advisor" to set up charging and troubleshoot

Goal 4 - Increase overall public acceptance and desirability of EVs

Strategy 4.1 - Educate general public to transform views and expectations on EVs as obvious choice in car sales

Action 4.1.1 - Work with partners (e.g., PEPCO, state) to develop and fund "What's a kW and a kWh" public education campaign

Action 4.1.2 - Via market research & focus groups, develop & implement marketing strategy aimed at transition to 100% EV

Action 4.1.3 - Support/Promote events like National Drive Electric Week and Drive Electric Earth Day

Strategy 4.2 - Improve/demystify EV/ZEV car-buying experience

Action 4.2.1 - Have website to match & schedule times for network of EV owners to provide free consulting sessions to potential EV buyers

Action 4.2.2 - Setup an EV "test track" where buyers can find & test all major EVs & chargers & ask questions of EV experts

Strategy 4.3 - Develop cadre of trained professionals to assist with these goals

Action 4.3.1 - Add an Electric Vehicle Infrastructure Training Program to the existing curriculum at Montgomery College, included as a standard segment of Electrician training

Action 4.3.2 - Add EV-related topics to MoCO vocational high school curriculum

Action 4.3.3 - Green job transition for garage workers to become electricians etc. to service charging stations

Strategy 4.4 - Mandate or incentivize dealerships to promote EVs

Action 4.4.1 - Mandate or incentivize dealers to become EV-educated, have plentiful inventory, have chargers for instruction and use, etc.

Action 4.4.2 - Adopt a dealership certification program to require and monitor actions described in 4.4.1

Action 4.4.3 - Institute a progressive tax to encourage dealers to have more EVs, and fewer ICE, cars on lot

Action 4.4.4 - Establish recognition and/or rewards for dealers who excel at selling EV's.

Strategy 4.5 - Increase ZEV options for public if/when technology develops

Action 4.5.1 - Monitor developments with water-based hydrogen fuel cell cars and include them in above actions (and charging network actions) when appropriate

Strategy 4.6 - Ensure that county operations convey preparedness and confidence

Action 4.6.1 - Plan for increased demand for county services related to transition such as increased permit applications, etc.

Goal 5 - Set clear targets and benchmarks to gauge success

Strategy 5.1 - Establish oversight group to identify and reach consensus on targets, gauge progress, create and modify strategies

Action 5.1.1 - Establish a county electric vehicle strategy overseen by a standing working group comprised of county officials, EV advocates and utility representatives. If current goals are to be met, target should be 100% EV's on road by 2027

Charging Network

Goal 6 - Increase access to public charging stations

Strategy 6.1 - Identify target number of charging stations

Action 6.1.1 - Review NREL and/or other model, and use results to set minimum requirements for deployment

Strategy 6.2 - Commit to significantly increasing number of publicly available chargers

Action 6.2.1 - Install XX,XXX publicly available EV chargers by 2030; Install and improve access to public charging facilities; Support/subsidize charging in publicly accessible locations; Achieve ubiquitous EV charging infrastructure; Place chargers in strategically-optimal locations after appropriate and timely study

Action 6.2.2 - Install XXX fast charging plazas by 2030; Expand public access fast chargers

Action 6.2.3 - Support expanding a system of publicly accessible EC charging stations and other AVF fueling stations

Strategy 6.3 - Increase access to charging stations in county govt buildings & county-owned parking lots

Action 6.3.1 - Significantly increase EVSE at Govt buildings & municipally-owned parking lots (note Sacramento case study)

Action 6.3.2 - Allow use of county garages/lots free of charge for overnight charging

Goal 7 - Increase installation of chargers, and EVSE chargers in particular, at homes & businesses

Strategy 7.1 - Reduce barriers to EVSE installation

Action 7.1.1 - **Expedited, streamlined permitting** for the installation of EV charging stations; Streamline permitting for EVSE installation to a web-fillable form, obtainable within one day.

Strategy 7.2 - Offer financial incentives to install charging stations in existing buildings

Action 7.2.1 - Offer incentives for **consumer/private sector** purchase of EVs and charging equipment; e.g., Feebate for County property taxes: decreased if property owner installs EV charger; increased a bit otherwise

Action 7.2.2 - Offer tax incentives to **businesses** that install recharging stations (including property tax incentives); e.g., Feebate for County property taxes: decreased if property owner installs EV charger; increased a bit otherwise

Action 7.2.3 - Distribute rebates for used EVs, Level 2 & DC fast chargers

Action 7.2.4 - Support/subsidize purchase of home chargers esp multifamily & low-income multi-family housing

Strategy 7.3 - Align real estate sales and rental required procedures to expedite expanded infrastructure

Action 7.3.1 - Enact new pre-sale requirements for real estate to require 240 outlet in garage or side of home for all SF home sales, 240V outlet at parking space for condos etc.)

Action 7.3.2 - Enact new required rental procedures to require multi-family buildings to install chargers upon all new or modified leases

Strategy 7.4 - Ensure every new building in the county is EVSE-ready

Action 7.4.1 - Adopt new standard/code, or adjust existing standards/codes, to require EVSE charging access (readiness or installation) for all new housing (240 V outlet in garage or side of home for all new SF construction, 240V outlet at parking space for multifamily)

Action 7.4.2 - Require EV-ready design in new developments and redevelopments

Action 7.4.3 - Mandate all new housing construction with four or more off-street parking spaces include at least one EV charging station per every four parking spots.

Action 7.4.4 - Require new and/or existing commercial buildings to install chargers

Action 7.4.5 - Adopt code language such as IGCC2018 to clearly communicate requirements; adjust code language to reflect above requirements

Strategy 7.5 - Ensure EV owners in existing apartment buildings have access to charging

Action 7.5.1 - Require apartment building owners to install at least one 110V outlet with dedicated parking space in year one. Encourage (require?) installation of cabling capable of handling 240V so later upgrade to 240V will be easy to implement

Goal 8 - Increase access to charging at the workplace

Strategy 8.1 - Identify & implement incentives

Action 8.1.1 - Meet w/business leaders to identify hurdles, potential incentives & get their buy-in

Action 8.1.2 - Incentivize Workplace Charging (AstraZeneca Example)

Goal 9 - Expand public access via innovative placement and providers

Strategy 9.1 - Ensure that all residences have access to charging within a set distance

Action 9.1.1 - Implement curbside EV charging. Issue an electric-car-only parking spot for EV owners without a garage or parking space installed in front of their home. Allow for installation of charger next to curbside EV parking.

Action 9.1.2 - Encourage Peer-to Peer EVSE Charging Networks

Action 9.1.3 - Build on existing electrical infrastructure to cost-effectively expand charging network (e.g., chargers associated with street lamps)

Strategy 9.2 - Increase ease of commuter charging

Action 9.2.1 - Work with WMATA to install banks of 110V outlets in Metro parking garages

Strategy 9.3 - Ensure emergency charging is available via mobile chargers

Action 9.3.1 - Ensure that tow trucks are equipped with mobile chargers to give the equivalent of a jump to stranded e-motorists

Strategy 9.4 - Use emerging/innovative steps in latter half of the 21st century

Action 9.4.1 - Electrify roads

Goal 10 - Increase access to charging for out-of-town travelers

Strategy 10.1 - Require all temporary lodging (hotels, etc.) provide EVSE access

Action 10.1.1 - All new hotel parking spaces must be EV capable. In addition, there must be one EV charging station per every 20 spaces for both new and existing hotels. Will need new laws and building codes.

Goal 11 - Develop and optimize partnerships to achieve goals

Strategy 11.1 - Establish productive working relationships with appropriate partners (including clean energy providers) to reach consensus, identify areas of mutual benefit & achieve economies of scale

Action 11.1.1 - Partner w/utilities & PUCs on special rates & smart chargers enabling EVs to provide grid storage; County/utility partnership to encourage chargers; Coordinate /partner with utility companies

Action 11.1.2 - Work with EV manufacturers and others to make MoCo a showcase of workable EV charging capacity

Strategy 11.2 - Work with clean energy providers to charging potential of clean energy sources

Action 11.2.1 - Work to develop solar micro-grids and other sources to provide fleet charging capacity (open to public as well as possible)

Action 11.2.2 - Allow for discounted energy use for charging if from solar

Goal 12 - Increase consumer confidence via education and outreach

Strategy 12.1 - Ensure that consumers & users are well-informed re: charging infrastructure & have high degree of confidence that charging is available to meet needs

Action 12.1.1 - Organize MoCo EV vehicle and EV charger purchasing cooperative

Action 12.1.2 - Update comprehensive, small-area, and development plans to provide guidance for EV and other AFV infrastructure locations.

Alternative Vehicles

Goal 13 - Increase the use of less energy-intensive non-traditional vehicles

Strategy 13.1 - Promote and facilitate broader use of smaller, less-energy-intensive, non-traditional vehicles

Action 13.1.1 - Promote (facilitate, incentivize, model, etc.) sales and use of smaller alternative electric vehicles - 3-wheeled, open, golf carts, scooters, bikes, small e-vans, etc.

Action 13.1.2 - Facilitate sales (via modeling, training, rebates, etc.) of EV scooters & similar vehicles w/ replaceable batteries at easily accessible sales outlets

Action 13.1.3 - Adjust zoning, rights-of-way, lane availability, etc. to allow for smaller/slower motorized vehicles

Transit

Goal 14. Ensure all County public transit buses are electrified

Strategy 14.1 - Accelerate transition to 100% electric transit buses - either battery electric or water-based hydrogen fuel cell

Action 14.1.1 - Stop all purchases of non-ZEV buses by 2021 or sooner. Electrify 100% of transit buses (RideOn, paratransit)

Action 14.1.2 - Provide for Electric BRT buses (battery electric or water-based hydrogen fuel cell) as technology allows

Action 14.1.3 - Provide incentives and disincentives to pressure DC and WMATA to use only electric Metro buses in County

Action 14.1.4 - Transition all garages and service stations to fully electric, prioritizing those with longest routes and those serving EJ areas

Strategy 14.2 - Research and act upon innovative practices to minimize County costs

Action 14.2.1 - Investigate innovative E-bus financing options such as purchasing the bus body but leasing the battery system for 12 years

Action 14.2.2 - Charge buses overnight, lowering demand on grid

Action 14.2.3 - During down time, use bus batteries as energy storage option

Action 14.2.4 - Use partially-spent bus batteries for energy storage once batteries cannot hold a charge sufficient for use in buses

Action 14.2.5 - Share garage and maintenance staff (for power systems for battery electric and hydrogen fuel cell) between county transit buses and MCPS buses

Strategy 14.3 - Track and ensure accountability on progress

Action 14.3.1 - Link evaluation of responsible MoCo staff with progress on this issue

Goal 15: Electrify all first-mile/last-mile transit

Strategy 15.1 - Ensure that all first-mile/last-mile (on demand) transit is electric

Action 15.1.1 - Purchase 100% electric for this purpose

Goal 16. Ensure electrification of taxi and ride-share vehicles

Strategy 16.1 - Establish goals and deadlines and implement strategies to achieve 100% electrification of taxi fleet and car sharing services

Action 16.1.1 - Using variable tax and licensing fees, electrify 100% of taxi fleet (including Uber/Lyft/etc.)

Action 16.1.2 - Using variable tax and licensing fees, electrify 100% of ride share and carshare vehicles

Goal 17. Ensure all MoCo school buses are zero-emission

Strategy 17.1 - Accelerate adoption of EV School Buses

Action 17.1.1 - Convert all MCPS school buses to EV buses on a schedule that prioritizes EJ schools

Strategy 17.2 - Use innovative measures to expand use and reduce net cost

Action 17.2.1 - Spearhead regional purchase of electric school buses to ensure economy of scale; purchase across jurisdictions

Action 17.2.2 - Optimize school bus use by using them as V2G energy storage facilities during summers and late afternoon/early evenings as a peak load reduction option

Strategy 17.3 - Track and ensure accountability on progress

Action 17.3.1 - Link evaluation of responsible MoCo staff with progress on this issue

Goal 18. Ensure that all private and other buses operation in the county are zero-emission

Strategy 18.1 - Ensure that all transit vehicles belonging to other entities are ZEV

Action 18.1.1 - Using financial incentives such as differential registration fees, ensure that all buses, vans, etc. belonging to towns, colleges, schools, camps, churches, and other entities operating in the county are ZEV by 2027

Action 18.1.2 - If above methods are unsuccessful, pass legislation to ban such vehicles from operating on county roads

Medium & Heavy Duty Vehicles

Goal 19. Expand the use of clean fuels in medium- and heavy-duty trucks and other commercial vehicles

Strategy 19.1 - Require full electrification of vehicles as where technologically feasible

Action 19.1.1 - Using variable tax and licensing fees, ensure 100% of urban delivery vehicles are zero emission

Strategy 19.2 - Minimize emissions of vehicles until electrification is viable

Action 19.2.1 - Medium/heavy-duty vehicle low-carbon fleet/fueling incentives and programs

Action 19.2.2 - Require commercial vehicle idle reduction

Strategy 19.3 - Encourage electrification (battery or water-based fuel cell) of heavy-duty vehicles where technology is not currently viable

Action 19.3.1 - Investigate zero emission truck corridors

Action 19.3.2 - Electrification of heavy-duty vehicles, with 40 percent of heavy-

duty on-road vehicle sales being either ZEV or diesel hybrid by 2030 and 95 percent by 2050 (not yet proven)

Action 19.3.3 - Electrification of non-road vehicles, including 50 percent of construction vehicles by 2050 (not yet proven)

Action 19.3.4 - Double heavy duty vehicle CAFE by 2020: Assumes institution of heavy duty CAFE standards, which would double current heavy duty vehicle fuel economy by 2020

County Fleets

Goal 20 - Minimize barriers to electrifying county fleet

Strategy 20.1 - Ensure charging infrastructure is adequate

Action 20.1.1 - Add alternative fuels and charging equipment and infrastructure (e.g., electric, hydrogen) to county fueling facilities. Retrofit garages and refueling facilities as needed.

Action 20.1.2 - Work with utilities to implement a smart charging /fast-charging system for fleets.

Action 20.1.3 - When installing networked chargers for fleets, open-source solutions should be chosen.

Goal 21. Electrify county automotive (and similar) fleet

Strategy 21.1 - Accelerate transition of county-owned automobiles and other vehicles to all-electric

Action 21.1.1 - Purchase only electric (battery or water-based hydrogen fuel cell) vehicles (no more gasoline or hybrid vehicles) where workable, starting immediately

Action 21.1.2 - Participate in Climate Mayors Electric Vehicle Purchasing Collaborative (coop purchasing for EVs)

Action 21.1.3 - Develop fleet management and transition plan to address annual transition goals to reach 100% electrification by 2027 - purchasing policies, provide staff training for use/maintenance of alternative fuel vehicles, add alternative fuels or charging equipment to public sector fleet refueling facilities

Strategy 21.2 - Reduce size of county administrative fleet

Action 21.2.1 - Develop and implement mobility services to allow for the reduction of the fixed administrative fleet

Goal 22. Use contracting requirements to speed and expand transition to electric vehicles

Strategy 22.1 - Use contracting requirements (in the permitting bid process) to specify electric vehicles where possible, and low-emission practices where not yet possible

Action 22.1.1 - For county construction and maintenance projects, require that all vehicles/engines maintain energy efficient operations, all vehicles/engines are manufactured after 2010.

Action 22.1.2 - For all county projects where diesel is the only option (e.g., currently off-road equipment), require anti-idling policies.

Action 22.2.2 - Require that all vehicles used for county contracts be electric where possible, and push envelope to pilot vehicles such as trash trucks etc.

<u>Other Fleets</u>

Goal 23 - Facilitate and simplify process for fleet purchase of EVs

Strategy 23.1 - Demonstrate financial sense of EVs to fleet managers/owners

Action 23.1.1 - Provide free consultation to largest MoCo fleet owners from an EV fleet financial advisor

Action 23.1.2 - Organize / assist with cooperative purchasing agreements to reduce cost of EV purchasing

Action 23.1.3 - Produce or point fleet owners to reliable, user-friendly web-based or print tools to estimate full cost & benefits of purchasing EVs & transition to EV, including financial and technical assistance resources

Strategy 23.2 - Streamline charger requirements

Action 23.2.1 - Expedited, streamlined permitting for the installation of EV charging stations, e.g., a web-fillable form, obtainable within one day

Goal 24 - Provide financial incentives for fleet purchase of EVs

Strategy 24.1 - Incentivize electrification via taxes & fees

Action 24.1.1 - Reduce fees for EV charger permitting for fleets beyond a certain size

Action 24.1.2 - Feebate for property taxes: increased or decreased depending on #/% of EVs in fleet or chargers

Strategy 24.2 - Provide direct financial incentives

Action 24.2.1 - Offer cash incentives for small business fleet owners to purchase their first or first group of EVs

Action 24.2.2 - Provide financial incentives to encourage large government and private fleets to convert to EV

Strategy 24.3 - Incentivize via preferential treatment in purchasing

Action 24.3.1 - Partner with other Wash COG municipalities in purchasing policy to favor package delivery from delivery fleets dominated by EVs

Goal 25 - Use targeted legislation to achieve goals

Strategy 25.1 - Mandate fleet transition to EVs

Action 25.1.1 - Require fleet owners of certain size to have a % of EVs or pay penalties

Advocacy

Goal 26 - Ensure that state policies encourage synergy with MoCo programs

Strategy 26.1 - Work with Maryland legislature to enact policies and legislation that incentivize electrification

Action 26.1.1 - Advocate for reduction of state registration fees for EVs

Action 26.1.2 - Advocate for state incentives reflecting ideas throughout this

spreadsheet - EVs on fast lanes, charging incentives, state building codes, state installation of chargers, etc.

Strategy 26.2 - Advocate for legislation to rid grid of carbon-based energy sources in order to achieve carbon-free charging

Action 26.2.1 - Advocate for 100% "no added carbon" RPS (Renewable Portfolio Standard) and energy grid by 2035

Action 26.2.2 - Advocate for CCE (Community Choice Energy) and for county commitment to purchase 100% clean energy if CCE is passed

Strategy 26.3 - Work with Public Service Commission (PSC) to allow policies that incentivize electrification

Action 26.3.1 - Take leadership role in promoting that PSC allow V2G (vehicle-to-grid) technology and associated net metering, both for buses during off-hours and also for partially-spent bus batteries

Strategy 26.4 - Advocate for Maryland to meet or exceed CAFE (fuel efficiency) standards for most progressive US state

Action 26.4.1 - Continue vigorous defense of California fuel efficiency standards and waiver - CAFE 55 mpg by 2030: Assumes that after CAFE 35.5 mpg is achieved in 2016, CAFE standards are further strengthened to 55 mpg by 2030; Follow CA Clean Cars & Obama EPA/DOT CAFE regs requiring 55 mpg by 2025

Goal 27 - Ensure that interstate policies encourage synergy with MoCo programs

Strategy 27.1 - Work with legislators from surrounding states to achieve regional GHG reduction goals

Action 27.1.1 - Align MD and VA HOV/HOT rules to allow for EV use in HOV/HOT lanes

Action 27.1.2 - Take leadership role in promoting increased RGGI fees and lowered caps, to encourage 100% clean PJM grid by 2027

Action 27.1.3 - Take leadership role in advocating for strong Transportation & Climate Initiative (TCI- regional cap-and-trade initiative for transportation sources) plan enabling drastic reductions in carbon-based fuel by 2035

Goal 28 - Ensure federal policies encourage synergy with MoCo programs

Strategy 28.1 - Advocate for strong Federal support, subsidies, and technology development to spur EV adoption

Action 28.1.1 - Advocate for national incentives for low-emitting, efficient vehicles, infrastructure, and technology, including the incentives (buy-backs, tax credits, etc.) listed elsewhere in this spreadsheet

Action 28.1.2 - Advocate for passage of "Schumer plan" which would include generous discounts and buybacks, and incentivize national charging network

Transportation Demand Management

Goal 1: Increase Public Transit Ridership

Strategy 1.1: Improve transit services

Action 1.1.1 - Increase Bus Frequency to 5 Min Between 5:00 am - 9:00 pm Monday to Saturday, with intervals of 15 min at other times and on Sundays

Action 1.1.2 - Provide More Ride-On Bus Routes and Other Transit Options at Strategic Congestion Nodes, Highway Junctions, etc. so 75% of residents in MoCo are within 1/2 mile of a public transit stop. Expand On-Demand Transit Throughout the Day and County so that More Mixed Used Housing / Commercial Options Are Available Near Transit

Action 1.1.3 - Increase Free or Low-Cost (Electric) Circulator Minivan Routes That Connect Schools with Recreation / Senior / Aquatic Centers or Other Activity / Employment Centers

Action 1.1.5 - Increase Frequency of MARC Services from Gaithersburg / Germantown or Extend Metro

Action 1.1.6 - Invest in more BRT routes & stations

Action 1.1.7 - Continue to invest and support Corridor Cities Transitway (CCT) for a full expansion of transit options for upper county residents

Strategy 1.2: Increase availability of transit benefit programs to reduce the cost of transit

Action 1.2.2 - Provide free Ride On & MetroBus SmartCard / Stipends for seniors (and maybe all MoCo residents)

Goal 2: Implement Improvements/Changes to Auto-Based Infrastructure to Support GHG Goals

Strategy 2.1 - Retrofit existing roads/ROWs to obtain optimal efficiency

Action 2.1.1 - Install fully adaptive traffic management systems on County and State roads within Montgomery County. MCDOT handles signal timing within MoCo for MDOT.

Action 2.1.2 - Setup Reversible lanes on I-270 and I-495 during Rush Hours

Action 2.1.4 - Create dedicated bus lanes on major roads to support other transit/future BRT network

Action 2.1.5 - Ensure Roundabouts are Fully Considered When Pursuing Traffic Signals

Action 2.1.6 - Expand to 1100 miles of Bike Paths, Bike Lanes Safely for Bikes, Scooters, Segways, Skateboards, Rollerblades and Pedestrians While Also Protecting Parklands (i.e. Agricultural Reserve)

Strategy 2.2 - Retrofit existing parking to support goals

Action 2.2.1 - Utilize County Parking Lots More Efficiently (i.e. Installation of Solar Panels for Electricity Needs)

Action 2.2.2 - Convert Surface Parking to Green Space so that by 2030 the County would Eliminate All Public Parking With Exception of Small Number of Handicapped, Electric, Hybrid Vehicle, and carpooling Spaces. To avoid spillover parking, this includes making street parking in residential areas zoned for local resident use only. Besides limiting access to parking in downtown commercial districts, a more restrictive approach would be to outright ban bringing cars into those areas as some other jurisdictions have done. Transform commercial shopping malls in the county into compact mixed use (residential, recreation, office, commercial, etc.) developments with their current parking lots turned into greenspace and PV installations.

Action 2.2.3 - Increase Parking Pricing by 100% (or More) On All County-Operated Facilities including metered parking on street. Designate meters on some spaces that operate at a lower hourly rate for handicapped, electric, and hybrid vehicles. Use smart (demand-responsive) parking rates to discourage use of parking

Action 2.2.4 - Revise County Development Code to limit the number of parking spaces allowed on private commercial properties and require owners and developers to invest $ saved in non-auto transport infrastructure.

Goal 3: Adopt Policies to Support Reduction in Vehicle Use

Strategy 3.1 - Adopt policies to reduce auto/TNC/truck use

Action 3.1.1 - Limit Number of Cars in Urban Areas in Phased Manner. This can be done using cordon pricing, which charges all vehicles entering a designated area, or by outright ban on cars, or high-emitting cars, in certain areas.

Action 3.1.2 - Adopt Road/Congestion Pricing Plan. E.g., Install EZ Pass Toll Booms Every 2 Miles on Major County Roads That Pays for the Operating Costs, Emergency Services, and GHG Emissions.

Action 3.1.3 - Prepare Truck Loading / Delivery Curb Control and Pricing Plan to Increase Efficiency of Public ROW Space

Action 3.1.4 - Impose Surcharge on Ride-Hailing Fleets for SOV Rides and Use Revenue to Support On-Demand Public Transit

Action 3.1.5 - Phase in climate-oriented Annual Motor Vehicle Registration Fee. The fee would be additional to current registration fees of$135/$187 for up to/over 3,700 lbs for 2 yrs. The new fee could vary accounting to emissions and/or value of vehicle; assume average value of $100 per year.

Strategy 3.2: Adopt policies to reduce road construction

Action 3.2.1 - Impose Immediate Moratorium on County transportation Investments that are Oriented to Motor Vehicles. Develop criteria for future investment decisions that incorporate a monetary value for the societal cost of carbon.

Action 3.2.2 - Take immediate Legal Action to Stop Widening of I-495 and I-270 (including retention/protection of parkland). As a possible legal strategy, call for a benefit/cost analysis of the project that incorporates a social cost of carbon. At a minimum, the Environmental Impact Statement needs to include the direct, indirect, and cumulative carbon emissions resulting from this project over its lifetime. Similar legal action could be initiated around the American Legion Bridge expansion project.

Goal 4: Adopt Policies to Promote Supportive Land Use & Development

Strategy 4.1: Adopt policies to promote infill development & use of existing transit resources

Action 4.1.1 - Eliminate Zoning Restrictions on Housing Construction in Infill Areas & Served by Transit & Other Non-Auto Modes

Action 4.1.3 - Ensure new development proposals include VMT reduction as approval criterion (eliminate parking)

Strategy 4.2: Adopt policies to increase provision & use of non-auto options

Action 4.2.1 - Create Tax Incentives to Establish More Activity / Employment Centers Focused on Green Industries Within County areas That Do Not have easy Accessibility to Public Transport. Transform commercial shopping malls in the county into compact mixed use (residential, recreation, office, commercial, etc.) developments with their current parking lots turned into greenspace and PV installations.

Action 4.2.2 - Ensure new development and redevelopment proposals include affordable and mixed-use housing options close to transit

Action 4.2.3 - Provide tax incentives to MoCo private companies to encourage carpool, mobility/dockless & telecommuting options as well as prove participation; increase compliance standard every 2 years

Action 4.2.4 - Eliminate zoning restrictions on constructing housing in areas served by non-auto modes and promote infill development; Revise County Code by requiring all new developments of commercial and multi-family residential buildings throughout the County to be connected to transit and/or within a ½ mile walk from a non-vehicle or alternative transport mode.

Goal 5 - Implement Community-Wide Climate Awareness Outreach & Incentives Strategy

Strategy 5.1: Create additional touchpoints for carbon emission awareness

Action 5.1.1 - Create Incentives for Residents to Use Carpooling for Other Activities (Outside Commuting Activities)

Action 5.1.2 - During Emissions Checks, communicate Anti-Idling Law and Alternatives for Decreasing GHG Emissions

Action 5.1.3 - Promote Use of Electric Car-Sharing Options

Action 5.1.4 - Encourage use of ITS Apps or "CommutePool" networks that Provide Real-Time Information on All Transit Options (and Could be Incorporated with Electric Car-Sharing Availability) and Provide GHG Emissions Info

Action 5.1.5 - Require employers & major existing commercial and multi-family residential buildings throughout the County to implement TDM strategies to promote non-auto travel among their employees, businesses & residents and incentivize implementation of strategies.

Action 5.1.6 - Encourage public and private schools in County to Have Students Use Free Ride-On Services

Action 5.1.7 - Make All Transit/Non-Auto Option Information Available in Multiple Languages & Multiple Learning Formats

Action 5.1.8 - Place Notices on All Gas Pumps in Montgomery County informing motorists that driving a gas-powered vehicle contributes to climate change. The message could inform motorists that each gallon of gas purchased equals 20 pounds of CO2 added to the atmosphere when they drive their car. Besides a static message on the pump, this program could include public service announcements that are placed on the video screens that some pumps now have.

Action 5.1.9 - Emphasize outreach awareness Campaigns around finding and working on local solutions to fight the Global Climate Change emergency.

Goal 6: Additional TDM Ideas That Are Not Covered Above (That Will Reduce GHG Emissions Significantly)

Strategy 6.1: Carbon Tax

Action 6.1.1 - Adopt a carbon tax of 20 cents/gallon on motor vehicle fuel sold in Montgomery County, with the revenues dedicated to funding projects to support other modes of transportation. The tax could be levied at either the retail (gas station) or wholesale (fuel jobber) level.

Action 6.1.2 - Implement a program that enables drivers to purchase carbon offsets such as offered by Clear Choice Energy

Walkable Bikeable Communities

Goal 1 - Prioritize planned bicycle and pedestrian projects

Strategy 1.1 - Implement Bicycle Master Plan and Pedestrian Master Plan projects

Action 1.1.1 - Identify timeline for completing existing walkability and bikeability projects throughout the County

Action 1.1.2 - Rapid implementation of projects from the Bicycle and Pedestrian Master Plans

Goal 2 - Ensure low-stress infrastructure exists for cycling and walking

Strategy 2.1 Prioritize projects that achieve a low-stress cycling/walking network

Action 2.1.1 - In the CIP, prioritize bicycle infrastructure projects and trail projects that complete gaps and connect existing bikeways and trails in the system to each other or commercial centers

Strategy 2.2 - Improve wayfinding for bicycling routes

Action 2.2.1 - Include bike trails and infrastructure on Metro, RideOn, and other Transit maps

Action 2.2.2 - Develop countywide bicycle wayfinding system

Strategy 2.3 - Ensure resiliency in the face of increased extreme weather events

Action 2.3.1 - Include culverts on trails in flood plain areas and implement stormwater management design on bike/ped lanes

Goal 3 - Enhance Safe Routes to School activities and school zone infrastructure

Strategy 3.1. Prioritize cycling/walking to school

Action 3.1.1 - Develop school zone infrastructure implementation plans

Action 3.1.2 - Ensure bike lanes and wider sidewalks within .25 miles of schools

Strategy 3.2. Instruct all elementary school students how to ride a bicycle and be safe pedestrians

Action 3.2.1 - Include bicycle and pedestrian safety education in public school curricula

Strategy 3.3 - Increase multimodal transportation options for students

Action 3.3.1 - Install bike racks on school buses

Action 3.3.2 - Increase number of bike racks at schools

Goal 4 - Modify roads to better serve non-motorized transportation needs

Strategy 4.1 - Identify roads with high volume of car traffic to be put on a 'road diet' - reducing lanes, increasing sidewalk capacity, adding bike lanes, adding stormwater/rain gardens, tree canopy, lane changes during rush hour, traffic calming devices

Action 4.1.1 - Reduce traffic volumes and speeds through the use of traffic calming or road diets.

Strategy 4.2 - Repurpose space that currently serves vehicles to be used by non-motorized modes

Action 4.2.1 - Implement pedestrian malls (car-free blocks in specific urban areas), and

try to co-locate with existing trail access

Action 4.2.2 - Close sections of parkways (i.e. Sligo Creek Parkway, Beach Drive) to traffic more frequently. Specifically, Sligo Creek Parkway should be closed all weekend instead of only Sunday daytime.

Action 4.2.3 - Implement superblocks (a la Barcelona) in urban parts of the county - one idea is the area of downtown SS bounded by Colesville, Spring, Wayne and Georgia. Correspondingly, street parking should not be allowed inside the superblock (but parking garages within the superblock and accessed from outside the block are acceptable).

Action 4.2.4 - Eliminate parking minimums

Strategy 4.3 - Modify traffic flow

Action 4.3.1 - Design roads to use roundabouts/traffic circles instead of stop lights, or systematically eliminate lights

Goal 5 - Ensure availability of non-motorized vehicles

Strategy 5.1 - Expand and regulate dockless transportation options

Action 5.1.1 - Establish formal parking zones for dockless vehicles, such as existing on-street vehicle parking spaces

Action 5.1.2 - Increase number of dockless scooter/bikeshare vehicles in county, but limit to only one or two companies

Goal 6 - Familiarize citizens with bicycling and walking through outreach and TDM

Strategy 6.1 - Educate people to become safe cyclists and pedestrians

Action 6.1.2 - Launch countywide campaign to educate the public on safe driving, cycling and walking, and relevant laws

Strategy 6.2 - Popularize biking and walking as a means of transportation

Action 6.2.1 - Create champions for walking and biking for large employers, students, schools and faculty

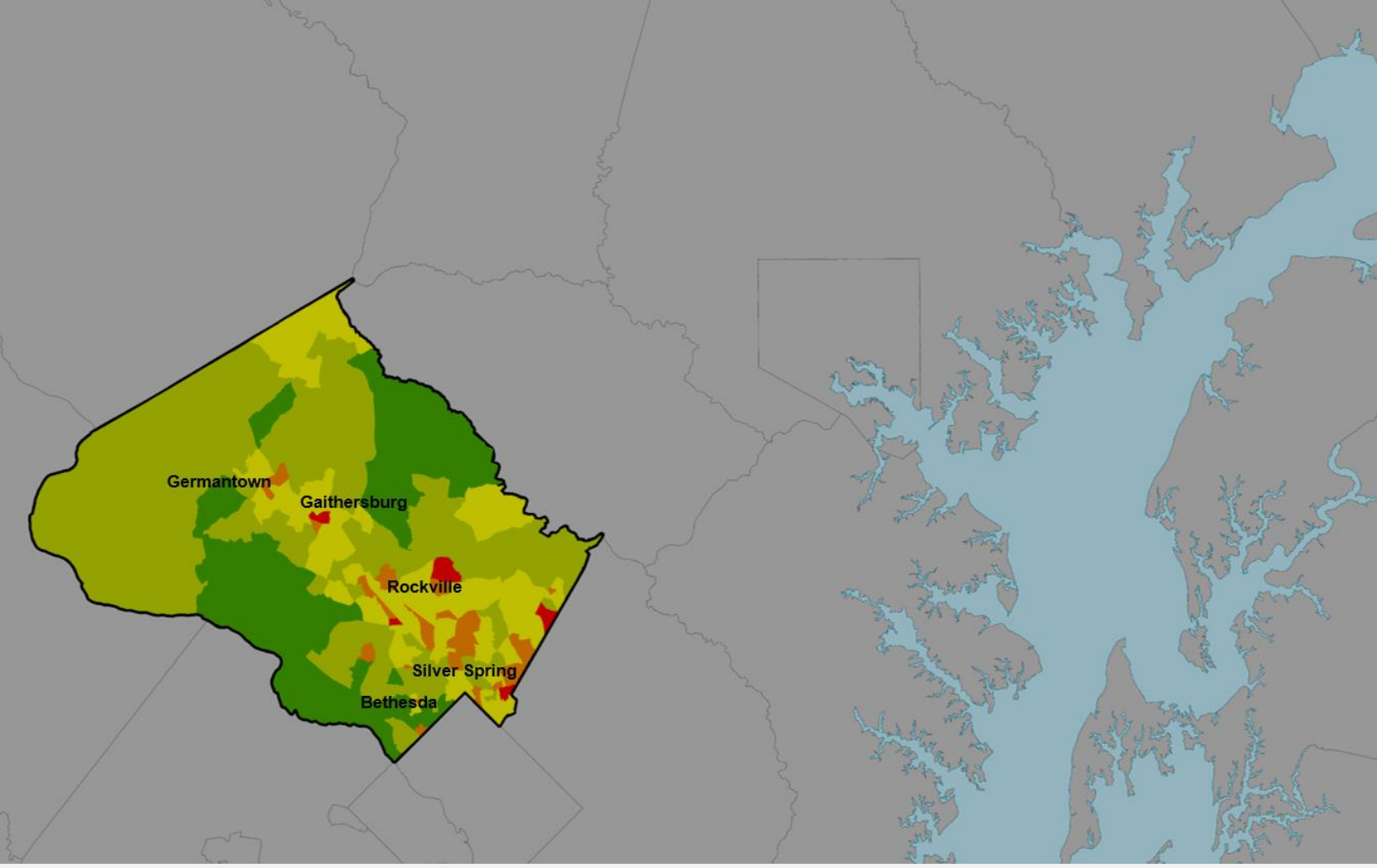
Action 6.2.2 - Establish competitions between jurisdictions to create more walkable and bikeable communities

This space is reserved for local art work from winners of the County's art contest.

Calling all artists and climate justice activists!

Montgomery County is hosting a competition for artwork to be featured in the County's climate action plan. What photos, drawings, poems, digital art, and memes (yes, we meant it, memes) invoke the need to protect your community from climate change? Help us to harness your creativity to sound the alarm about the climate emergency. Art is an incredibly important tool that will engage all County residents from a variety of backgrounds. Through this contest, we hope to reach those who might not have previously been engaged in the climate planning process, especially those from marginalized backgrounds who will be disproportionately impacted by changes in climate. The deadline for the contest in Sunday, January 31, 2021. For more information, please visit ***the art contest website***.

Appendix C: Climate Vulnerability Assessment



Montgomery County, Maryland
Climate Vulnerability Assessment

Climate Action Plan ("CAP")

Submitted:
December 10, 2020

AECOM

Table of Contents

Executive Summary

AECOM is developing a Climate Action Plan ("CAP") for Montgomery County, Maryland, to identify a list of high-impact actions that will provide a path to the County's goals of 80% reduction of greenhouse gas (GHG) emissions by 2027 and 100% reduction by 2035.[1]

One component of the CAP is a climate vulnerability assessment analyzing the County's climate baseline and projected spatial climate threats through projection years of 2035, 2050, and 2100 for two different climate scenarios: Representative Carbon Pathway 4.5 (RCP4.5), a moderate GHG increase, and RCP8.5, a larger increase in GHG emissions. Future precipitation, temperature, and drought conditions were considered along with current high wind data. Increases in precipitation and worsening drought conditions are projected, but the most severe climate hazard appears to be temperature, with a large increase in the number of days above 95°F, as shown for the RCP4.5 and RCP8.5 scenarios in Figure 1-1.

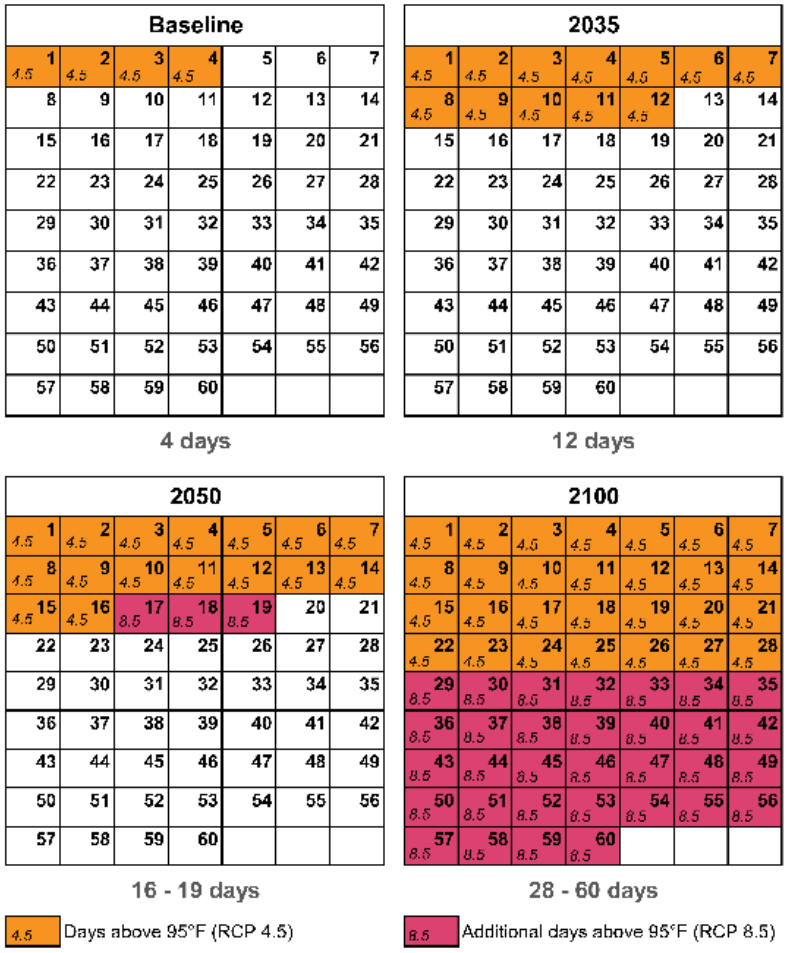


Figure 1-1. Average number of days above 95°F for Montgomery County

1 https://www.montgomerycountymd.gov/COUNCIL/Resources/Files/res/2017/20171205_18-974.pdf

The future climate conditions were evaluated in seven asset categories representing key components of the County's built and human resources: transportation; critical and County resources; utilities; stormwater management systems; the agricultural reserve; parks, wetlands, and trees; and people and homes.

The vulnerability assessment considers the exposure, sensitivity, and adaptive capacity of these asset categories compared to the climate risks. Temperature is expected to have the most impact on assets within the County, with precipitation and drought coming in at a close second and third, respectively. High winds remain a hazard of concern but not to the same degree as the other hazards under consideration. Future wind conditions were not considered quantitatively, which may underrepresent their impact on County assets.

Looking at the exposure, sensitivity, and adaptive capacity of the asset categories found throughout Montgomery County, the highest risk asset categories and hazard combinations are:

- **Transportation:** Precipitation and Temperature
- **Utilities:** Temperature, Drought, and High Winds
- **Stormwater Management:** Precipitation
- **Agriculture:** Temperature and Drought
- **People and Homes:** Precipitation, Temperature, and Drought

Although other hazards pose some risk to the asset categories listed above, those risks are more limited than that of the hazards listed. Additionally, there are lower hazard risks for Critical and County Resources and Parks, Wetlands, and Trees.

1.0 Introduction

To assess Montgomery County's climate vulnerability for the Climate Action Plan (CAP), AECOM estimated baseline and projected climate data, and collected relevant asset datasets and grouped them into seven categories: transportation; critical and County resources; utilities; stormwater management; the agricultural reserve; parks, wetlands, and trees; and people and homes. This asset data is presented in Section 2.0.

The objective of this vulnerability study was to assess future climate risks through down-scaling global climate change information. This report estimates projected climate impacts for 2035, 2050, and 2100 for two CO_2 concentration scenarios, as presented in Section 3.0. This data can be used for future studies that focus on assets or proposed actions.

The goal of this climate vulnerability assessment is to understand the County's exposure and sensitivity to current and future natural hazards, including high heat, drought, changing precipitation patterns, high winds, and combinations of these hazards ("other climate hazards"), and to understand the adaptive capacity of assets within the County. Data results are presented in Section 4.0, with conclusions in Section 5.0.

For the next step in the process, the climate vulnerability assessment data will be used to help prioritize the CAP actions. Details on this process are provided in the main CAP document.

2.0 Asset Data

Assets within the context of this vulnerability assessment have been broadly defined to include key structural components of a system such as roadways, hospitals, and stormwater management/conveyance as well as the people within the community, with a particular focus on socially vulnerable groups. Asset data was provided by the Montgomery County Department of Environmental Protection and collected online from other sources listed in Attachment A. The assets were grouped into seven categories: transportation, critical and County resources, utilities, stormwater management systems, the agricultural reserve, parks and wetlands, and people. Due to the broad scope of this assessment, it was not possible to consider all relevant assets within each category. Additionally, many asset categories have interdependencies (for example, stormwater management systems and transportation) that are not considered in this assessment. The following sections outline which assets were considered in each category.

2.1 Transportation

Transportation assets collected for this project include:

- Bikeways
- Ride On Bus Stops
- Street Centerlines (including Emergency Routes and Major Roads)

- Railroads
- MARC Stations
- Metro Stations
- Airports

Montgomery County transportation assets are shown in Figure 2-1.

2.2 Critical and County Resources

Assets in the Critical and County Resources group include a variety of County-owned buildings and places as well as some privately owned facilities. The assets included in this category include:

- Schools (elementary, middle, and high)
- County Recreation Centers
- Libraries
- Health and Human Services (HHS) Nursing Homes
- Hospitals
- Police Stations
- Fire Stations
- Emergency Shelters (Note: these are a sub-set of high schools and recreation centers)
- Multi-Agency Buildings

These layers, in addition to a County-owned property layer, are shown in Figure 2-2.

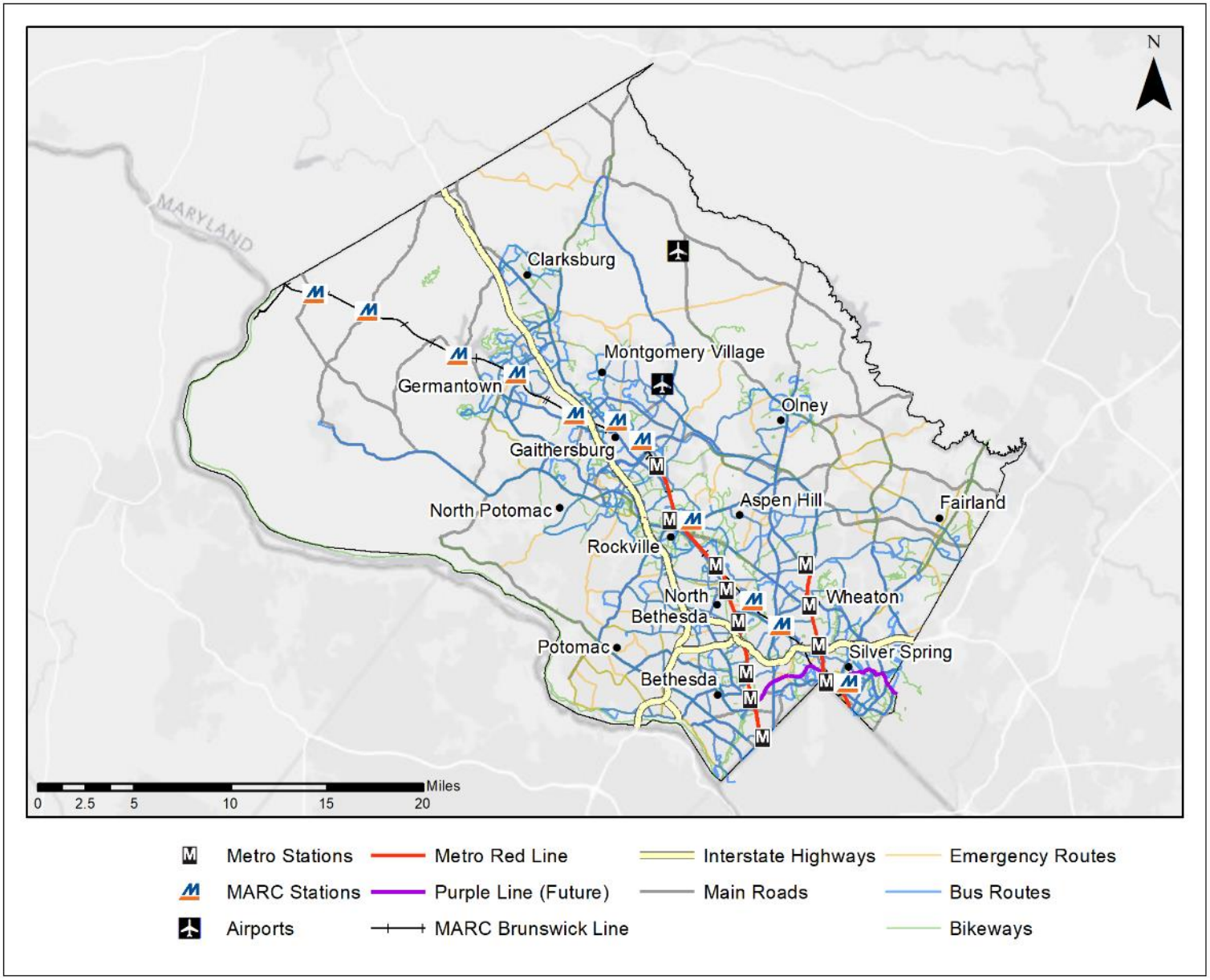


Figure 2-1. Transportation assets in Montgomery County

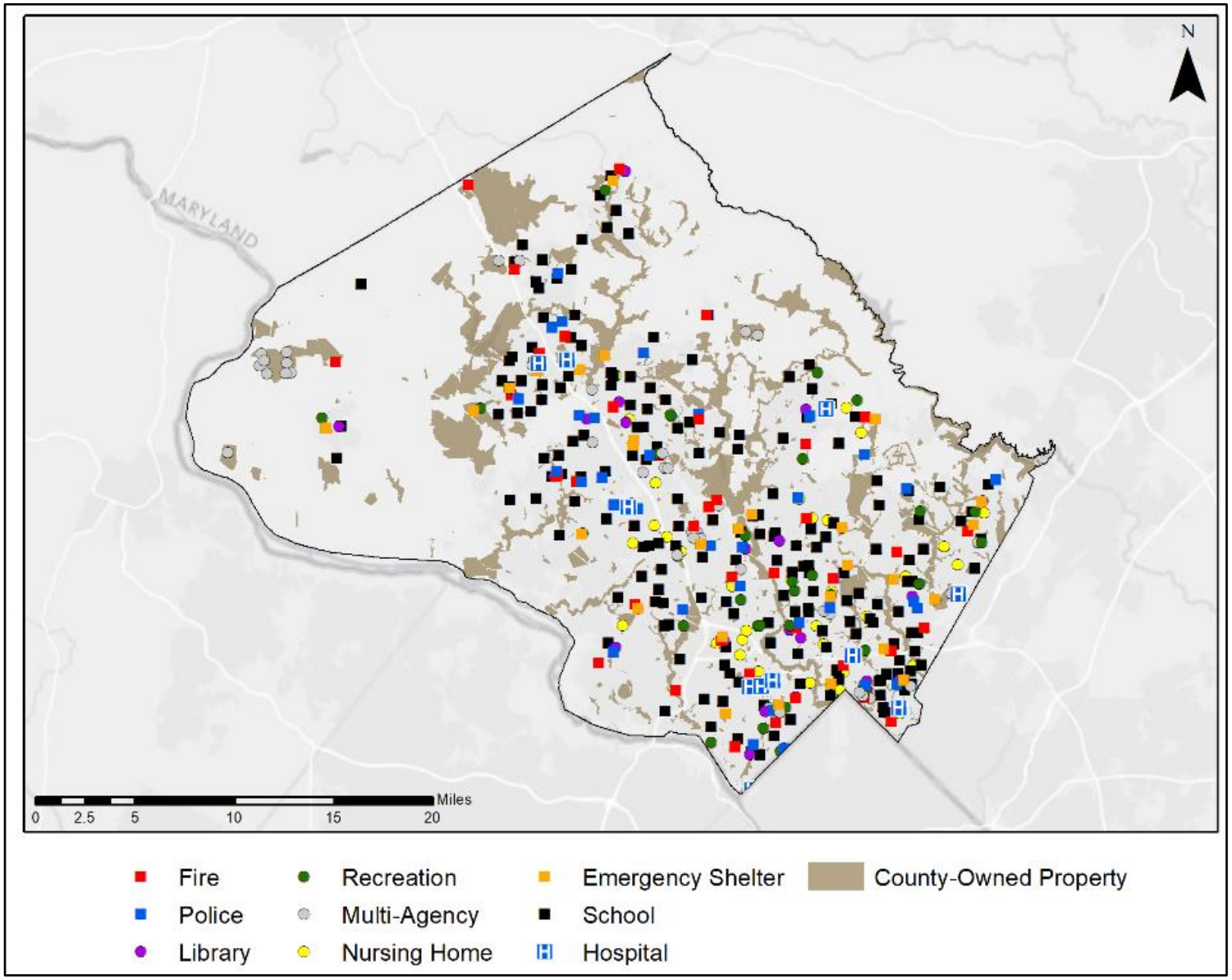


Figure 2-2. Critical and County Resources assets in Montgomery County

2.3 Utilities

For this assessment, utilities include:

- Drinking Water Reservoirs
- Pump Stations
- Electrical Lines
- Substations
- Montgomery County Resource Recovery Facility
- WSSC Potomac Water Filtration Plant
- Shady Grove Trash Transfer Station

Figure 2-3 shows key utility assets for Montgomery County.

2.4 Stormwater Management System

The stormwater management system is an important component in preventing flooding. The following asset types were included in this category:

- Dry/Wet Ponds
- Swales and Bioswales
- Infiltration Trenches
- Underground Detention Basins
- Dry Wells
- Culverts

Figure 2-4 shows stormwater assets throughout the County.

2.5 Agricultural Reserve

In 1980, the Montgomery County Council created what is now called the Agricultural Reserve, which encompasses 93,000 acres along the County's northern, western, and eastern borders. The Agricultural Reserve shows the County's sustained commitment to agriculture and has helped retain more than 500 farms within the County boundary, despite development pressures. This valuable County asset is shown in Figure 2-5.

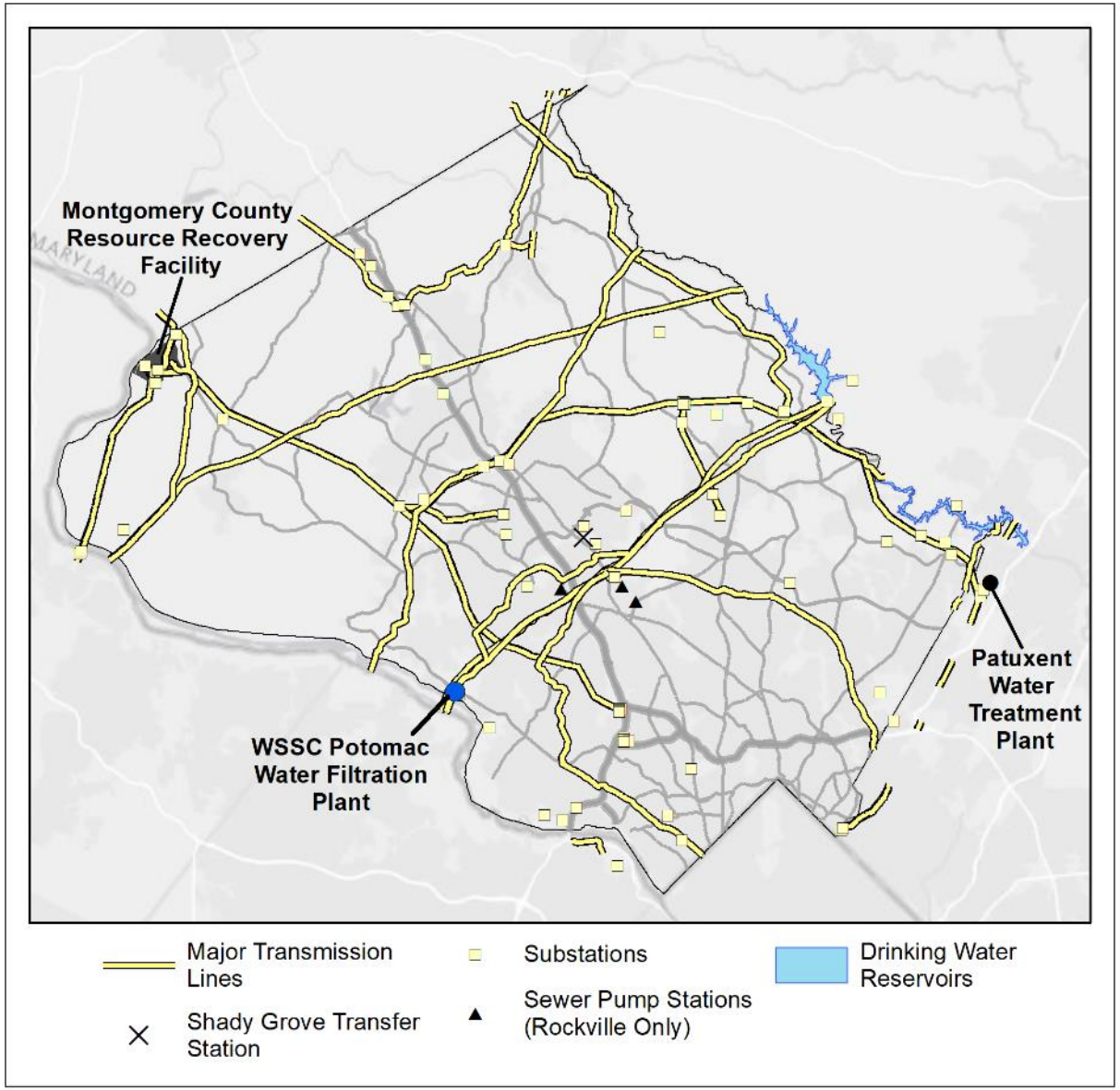


Figure 2-3. Utility assets in Montgomery County

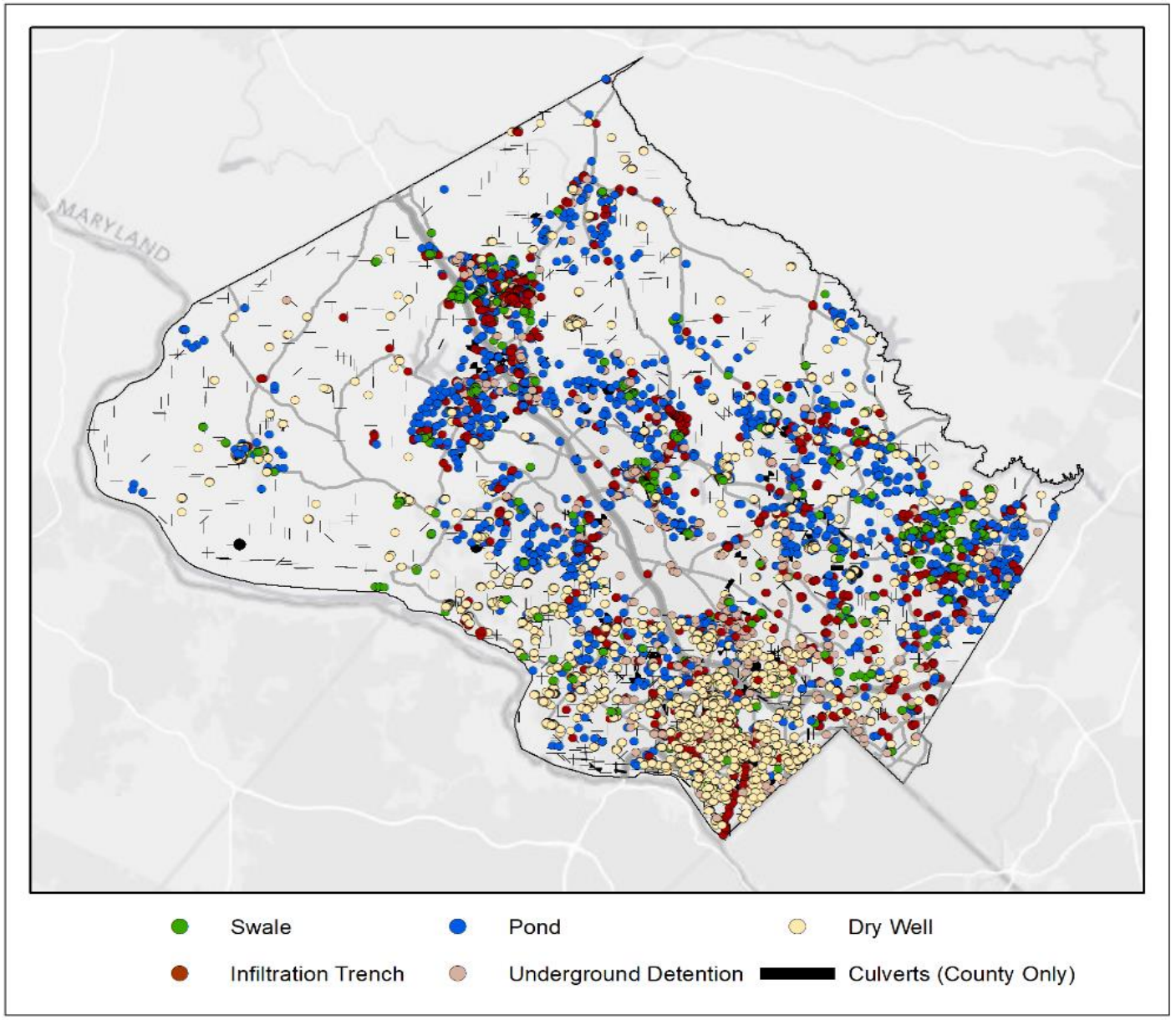


Figure 2-4. Key stormwater assets in Montgomery County

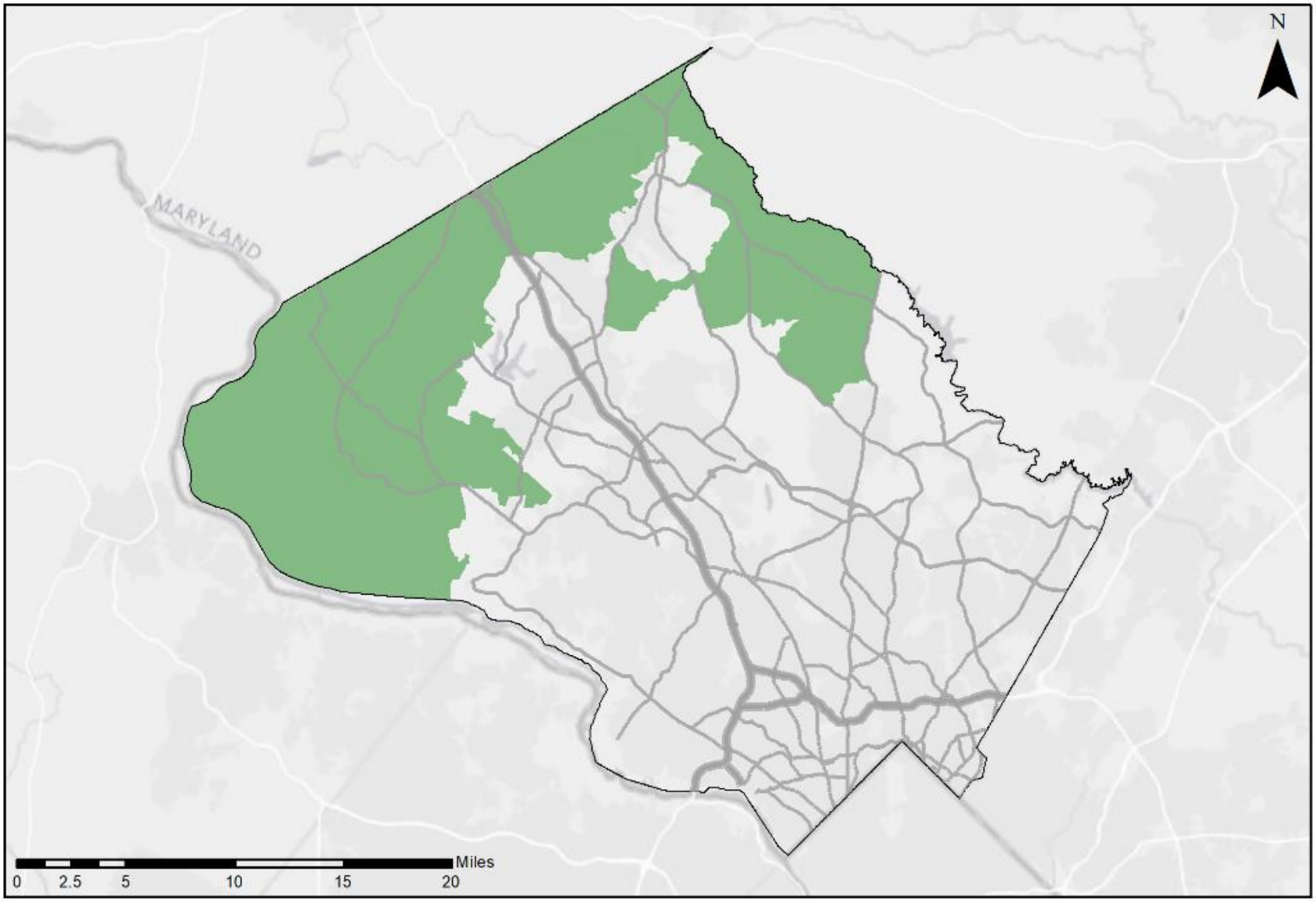


Figure 2-5. Montgomery County Agricultural Reserve (in green)

2.6 Parks, Wetlands, and Trees

Parks, wetlands, trees, and other open spaces are an important asset category in Montgomery County. This asset category provides habitat for many species of Montgomery County's flora and fauna as well as recreational areas for the community. Figure 2-6 shows the park and wetland areas within Montgomery County.

2.7 People and Homes

Traditional vulnerability assessments include mostly structural assets such as those listed above. This analysis also includes *homes* as an asset category; the *people* who live in the County are considered part of this asset category. This category focuses on health and wellness of all County residents, but especially vulnerable communities as well as the homes and properties where they live. The U.S. Census Bureau estimated the County population at 1,050,688 as of July 2019.[2]

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) (form 2016) was used to assess socially vulnerable areas within the County. CDC defines social vulnerability as "the potential negative effects on communities caused by [natural or human-caused] external stresses on human health."[3] The CDC SVI uses 15 U.S. Census variables, including poverty and crowded housing, to identify communities that may need additional support when preparing for hazards or recovering from a disaster. The 15 social factors are grouped into four themes: (1) socioeconomic status, (2) household composition, (3) race/ethnicity/language, and (4) housing/transportation. The four themes are then combined into a final SVI ranking with values ranging from 0 to 1, with 1 being the most vulnerable and 0 being the least. The most vulnerable communities are shown in dark red in Figure 2-7.

2 https://www.census.gov/quickfacts/montgomerycountymaryland
3 https://www.atsdr.cdc.gov/placeandhealth/svi/index.html

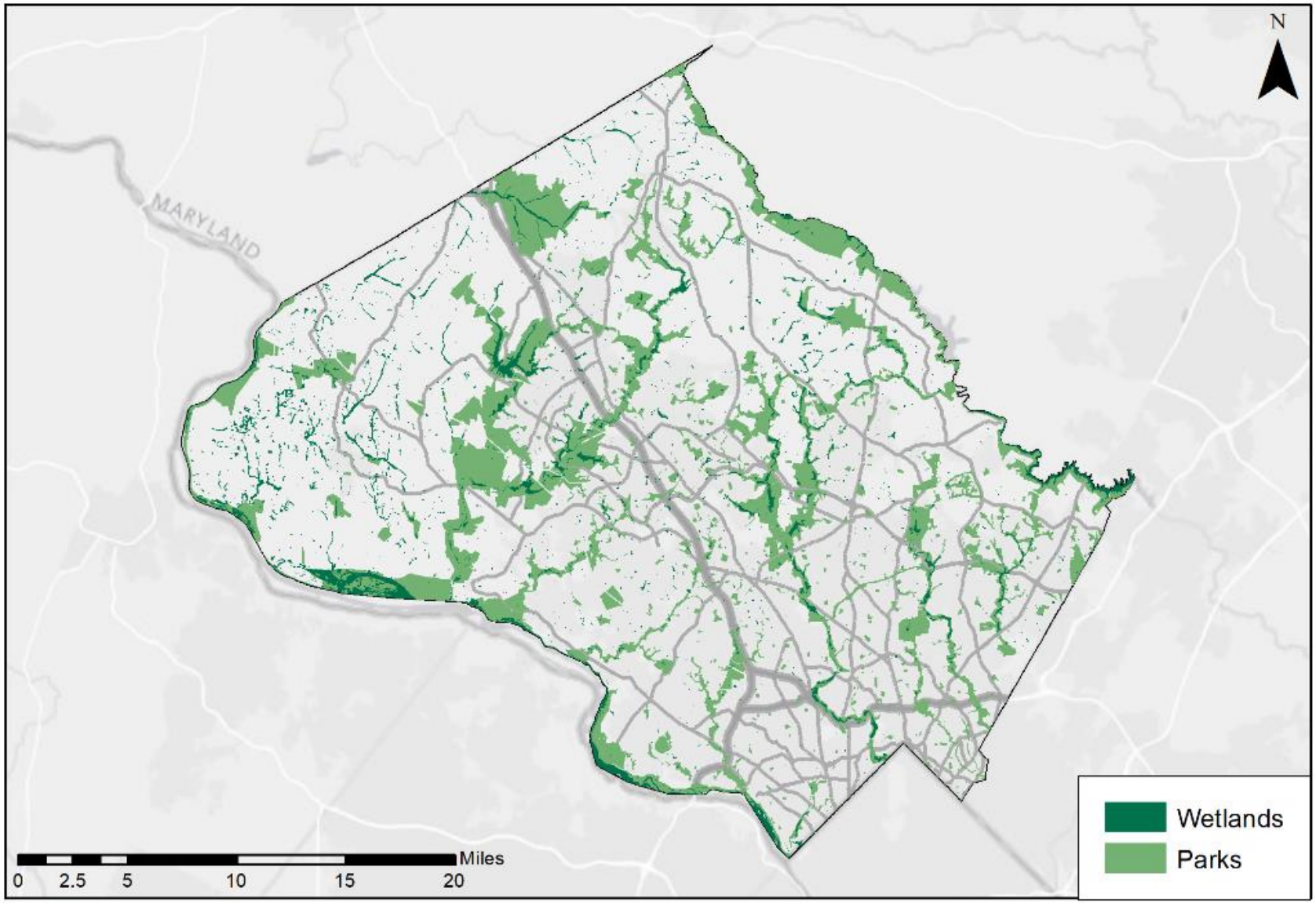


Figure 2-6. Parks and wetland assets in Montgomery County

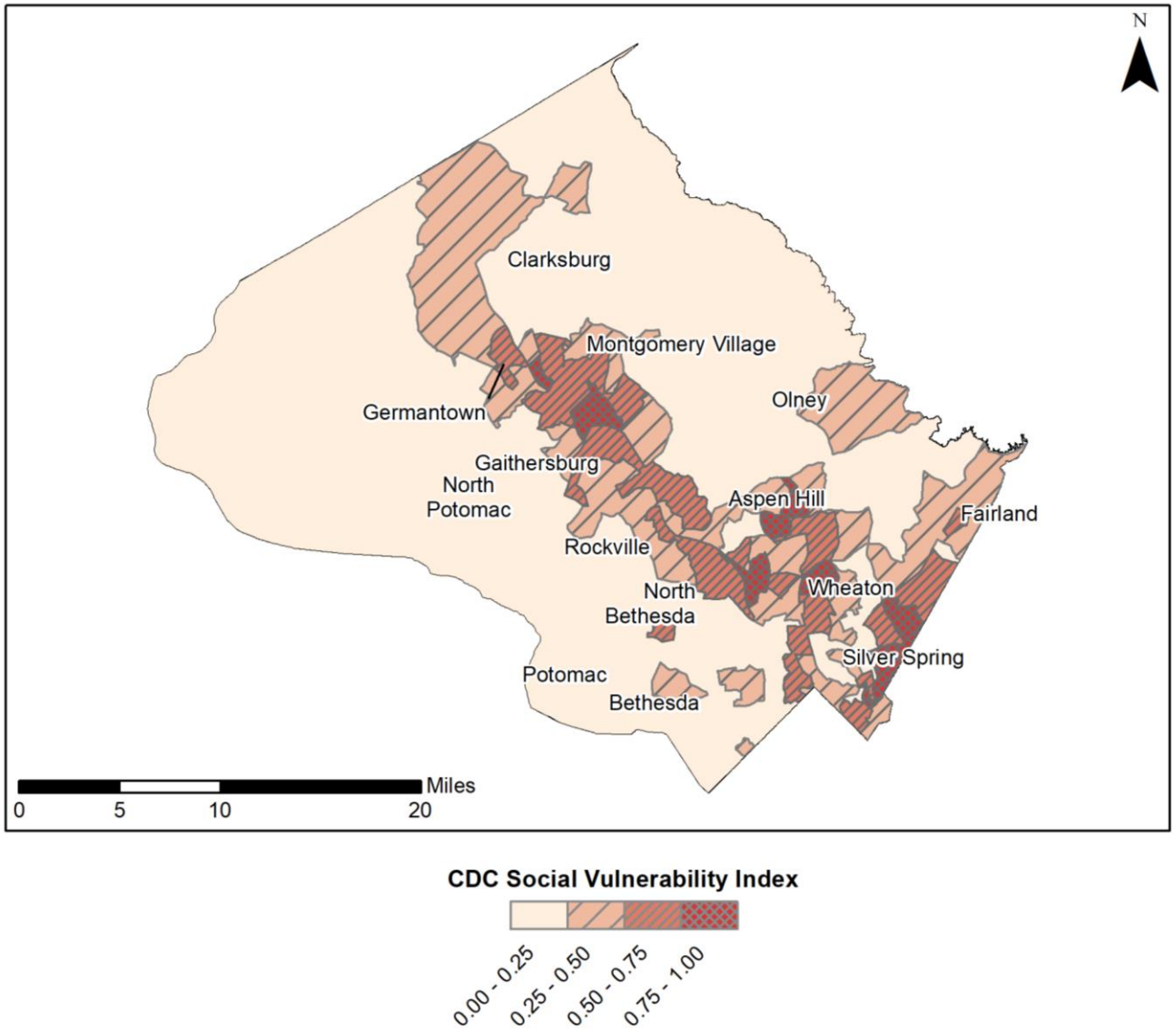


Figure 2-7. Social vulnerability in Montgomery County

3.0 Future Conditions Climate Assessment

The vulnerability assessment seeks to understand the impact of exposure of assets to natural hazards. For this study, the project team performed a statistical analysis of temperature and precipitation downscaled from general circulation model (GCM) output for two representative concentration pathways (RCP4.5 and RCP8.5) and four time horizons as shown in Table 3-1.

Table 3-1. Time Horizons for Future Conditions Climate Assessment

Time Horizon	Period of Analysis
Baseline (Historical)	1950-2005
2035	2005-2035
2050	2020-2050
2100	2070-2100

RCP8.5 is the "worst case" scenario included in the most recent Intergovernmental Panel on Climate Change (IPCC) set of scenarios, representing unabated emissions without any advances in technology or implementation of any climate action measures, while RCP4.5 represents a more optimistic "stabilization" scenario where atmospheric greenhouse gas concentrations increase until mid-century (~2050), after which concentrations remain stable until 2100.

The following sections discuss the methods used in the future conditions climate assessment as well as the results.

3.1 Methodology

The future conditions statistical analyses performed for this study were driven by gridded observed data and statistically downscaled GCM outputs developed by the Bureau of Reclamation. The dataset provides a high spatial resolution (6-kilometer x 6-kilometer) of daily downscaled precipitation data from 32 GCMs through the localized constructed analogs (LOCA) statistical downscaling method.[4]

AECOM conducted post-processing of the LOCA dataset to calculate future temperature, precipitation, and drought statistics using the Forecasting Local Extremes (FLEx) tool, a method developed by AECOM to retrieve and analyze statistics for a large number of downscaled GCMs and grid cells. After calculating the statistics for each grid cell, the future condition results were then mapped using a geographic information system (GIS) model framework to display statistics over the entire study area for further evaluation.

In the future conditions assessment, all 32 GCMs were equally weighted as an ensemble and analyzed to capture the full range of model variability, based on guidance from the IPCC that an ensemble average of several GCMs is expected to outperform the results of individual ensemble

4 Pierce, D. W., Cayan, D. R., & Thrasher, B. L. (2014). Statistical Downscaling Using Localized Constructed Analogs (LOCA). Journal of Hydrometeorology, 2558-2585.

members and provide an improved “best estimate” forecast.[5] Statistics were calculated for each grid cell separately and then spatially averaged (i.e., area-weighted) for the County using the jurisdictional boundary.

3.2 Temperature

The results from the temperature analysis are shown in Figure 3-1, Figure 3-2, Figure 3-3, and Figure 3-4. Average annual temperatures are projected to increase significantly, with the greatest changes in summer and autumn. Extreme heat is also projected to increase significantly, with the average annual number of days above 95°F and 105°F increasing by 56 and 9 days, respectively, by 2100 in RCP8.5. Additionally, the number of nights above 75°F is projected to increase from close to zero currently to 12 nights per year in RCP4.5 and 40 in RCP8.5 for 2100.

5 IPCC. (2007). The Multi-Model Ensemble Approach. Retrieved June 2018, from IPCC Fourth Assessment Report: Climate Change 2007. Available: https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch10s10-5-4-1.html

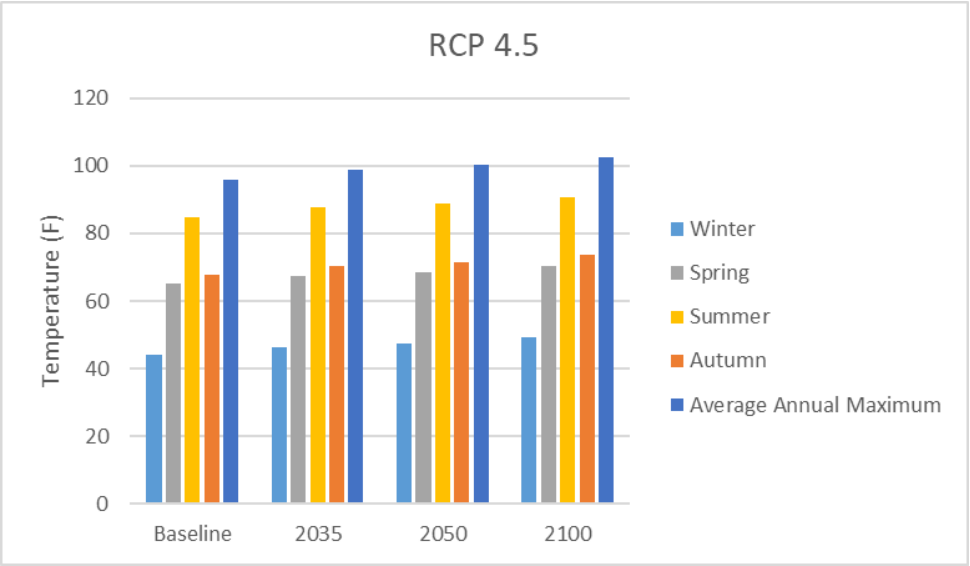


Figure 3-1. Future annual maximum and seasonal maximum temperature (RCP4.5)

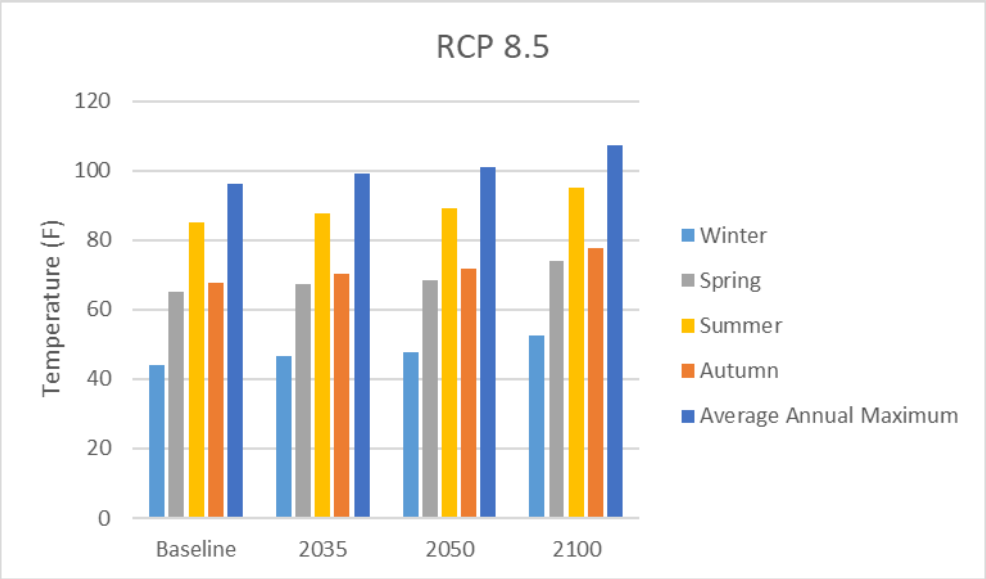


Figure 3-2. Future annual maximum and seasonal maximum temperature (RCP8.5)

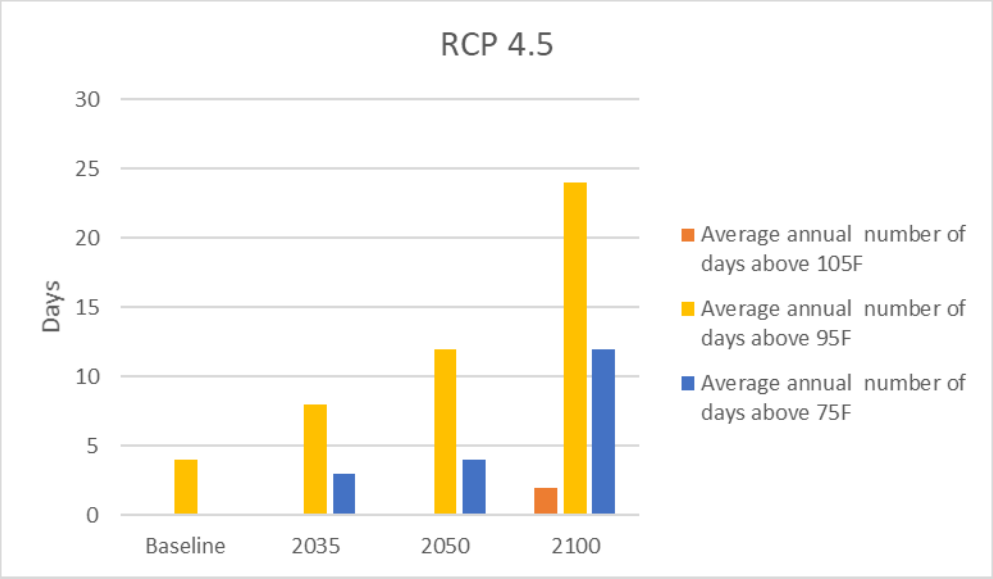


Figure 3-3. Future average annual number of high heat days (RCP4.5)

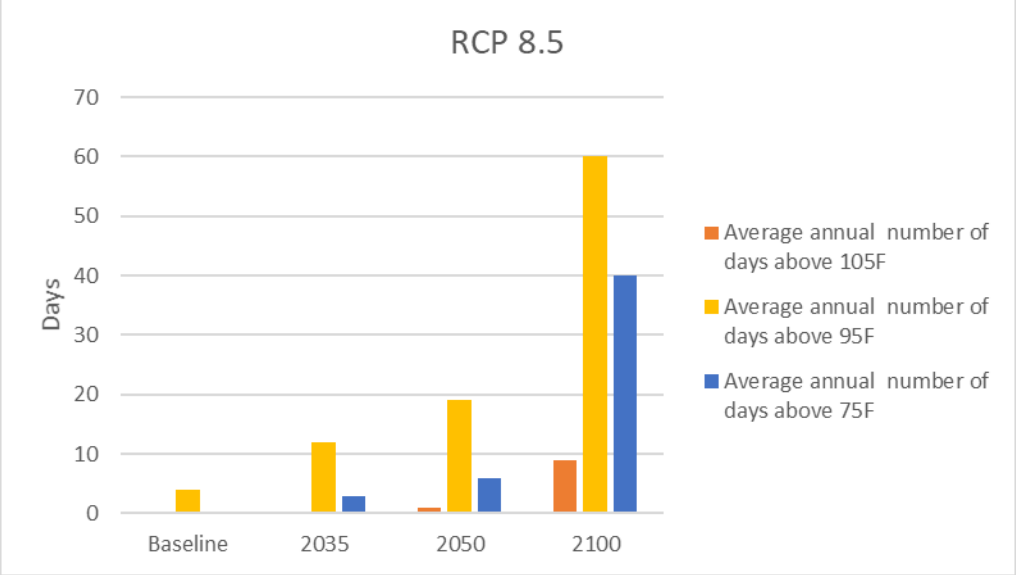


Figure 3-4. Future average annual number of extreme heat days (RCP8.5)

3.3 Drought

Future changes to drought were evaluated by calculating the monthly Palmer Drought Severity Index (PDSI) and then calculating the average annual number of months of mild, moderate, severe, and extreme drought. These types of drought are defined by the National Oceanic and Atmospheric Administration (NOAA) using the following PDSI values:

- PDSI 1 to -2 = Mild Drought
- PDSI -2 to -3 = Moderate Drought
- PDSI -3 to -4 = Severe Drought
- PDSI -4 or less = Extreme Drought

The results of the drought analysis are shown in Figure 3-5 and Figure 3-6. Mild drought conditions are projected to decrease or stay the same in both RCP4.5 and RCP8.5, while the annual risk of moderate, severe, and extreme drought is projected to increase significantly by the year 2100. Mild droughts decrease in frequency as harsher droughts occur more frequently instead.

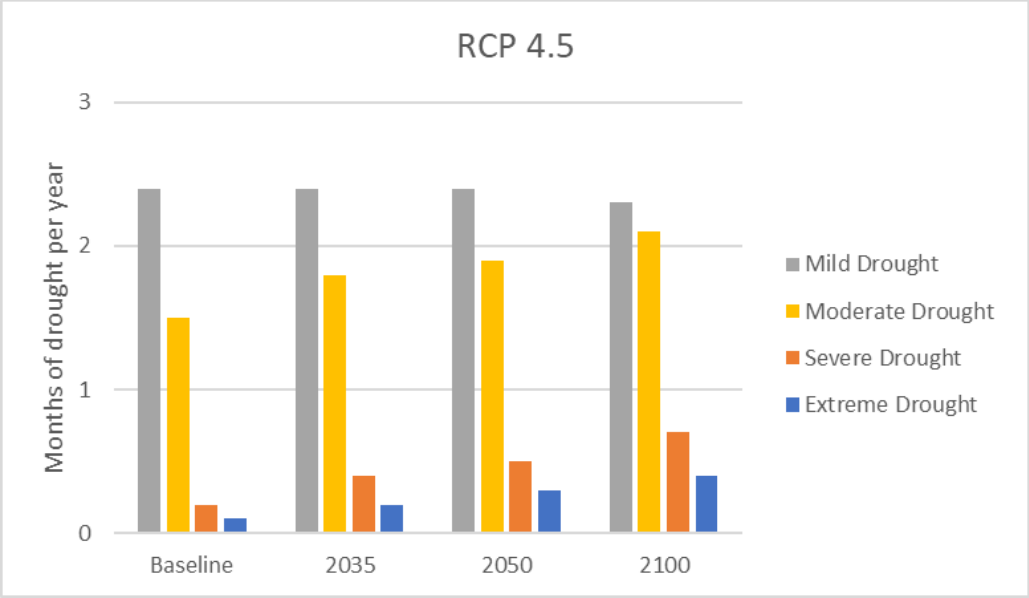


Figure 3-5. Future average annual number of months of drought using PDSI (RCP4.5)

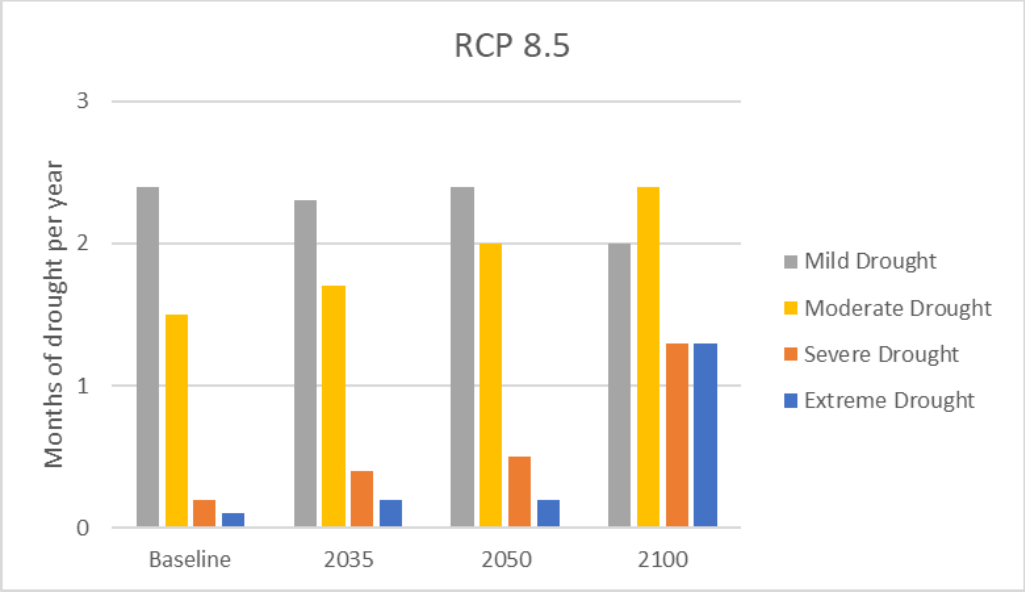


Figure 3-6. Future average annual number of months of drought using PDSI (RCP8.5)

3.4 Precipitation

The results from the precipitation analysis are shown in Figure 3-7, Figure 3-8, Figure 3-9, Figure 3-10, and Figure 3-11. Average annual total precipitation is projected to increase by approximately 6% in RCP4.5 and 9% in RCP8.5 by the end of the century. Figure 3-11 shows an increase of 5% and 7% for RCP4.5 and RCP8.5, respectively, in the percentage of total rainfall due to days with 95th percentile precipitation depth or greater, suggesting a shift to higher-intensity events in the future despite a small increase in overall annual rainfall.

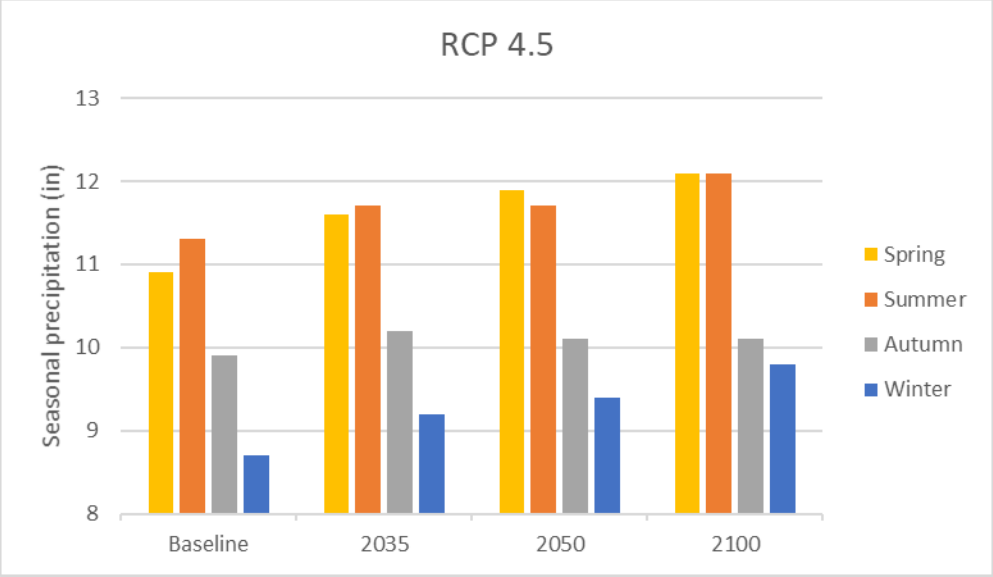


Figure 3-7. Future seasonal precipitation (RCP4.5)

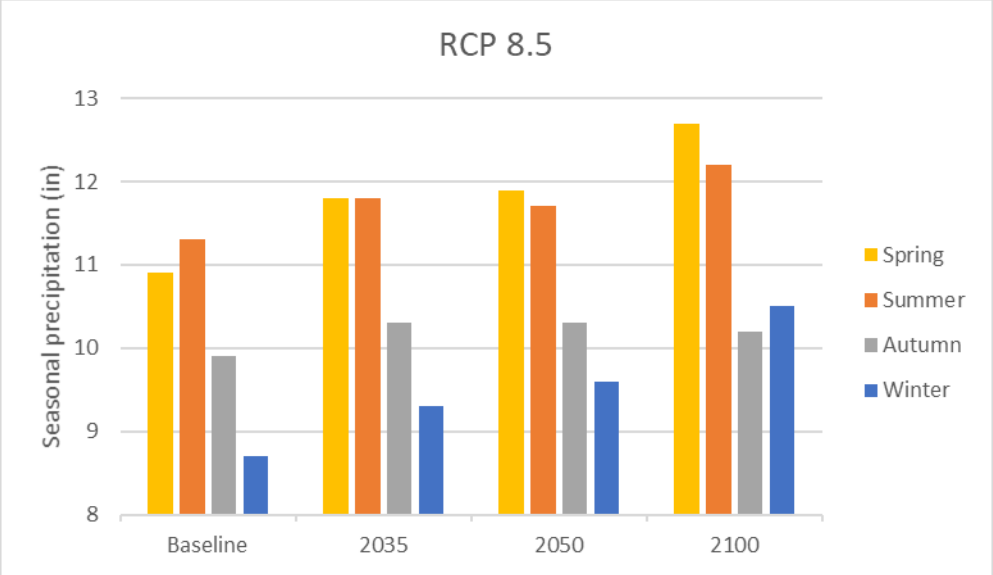


Figure 3-8. Future seasonal precipitation (RCP8.5)

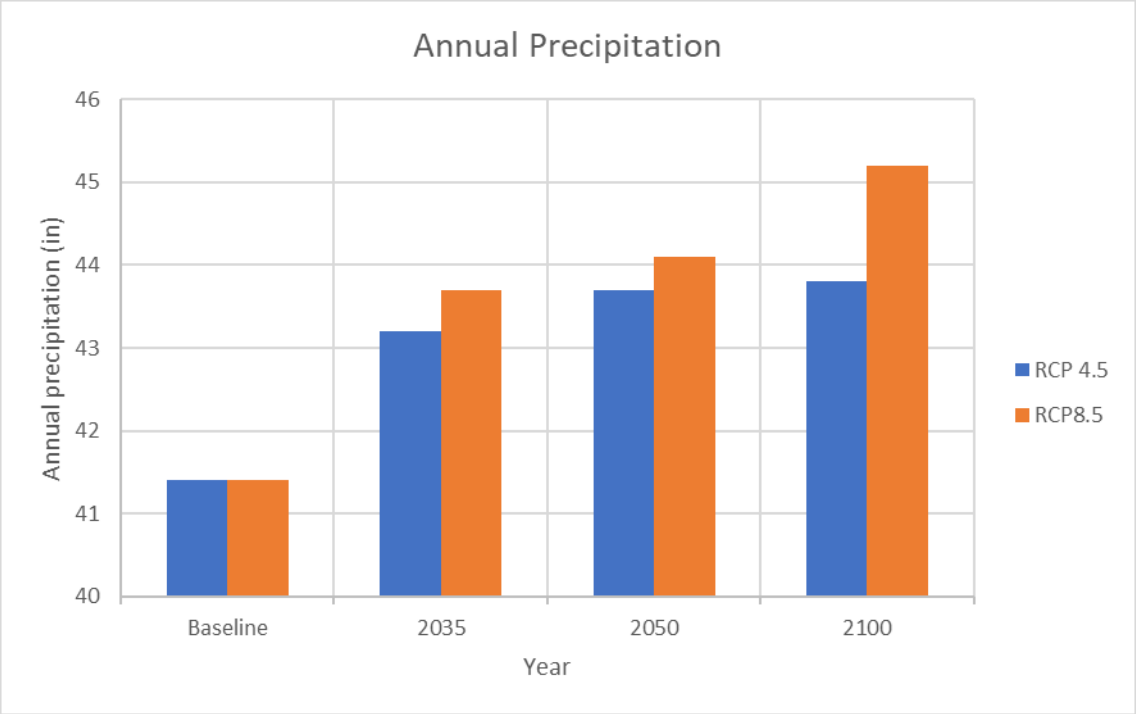


Figure 3-9. Future total annual precipitation

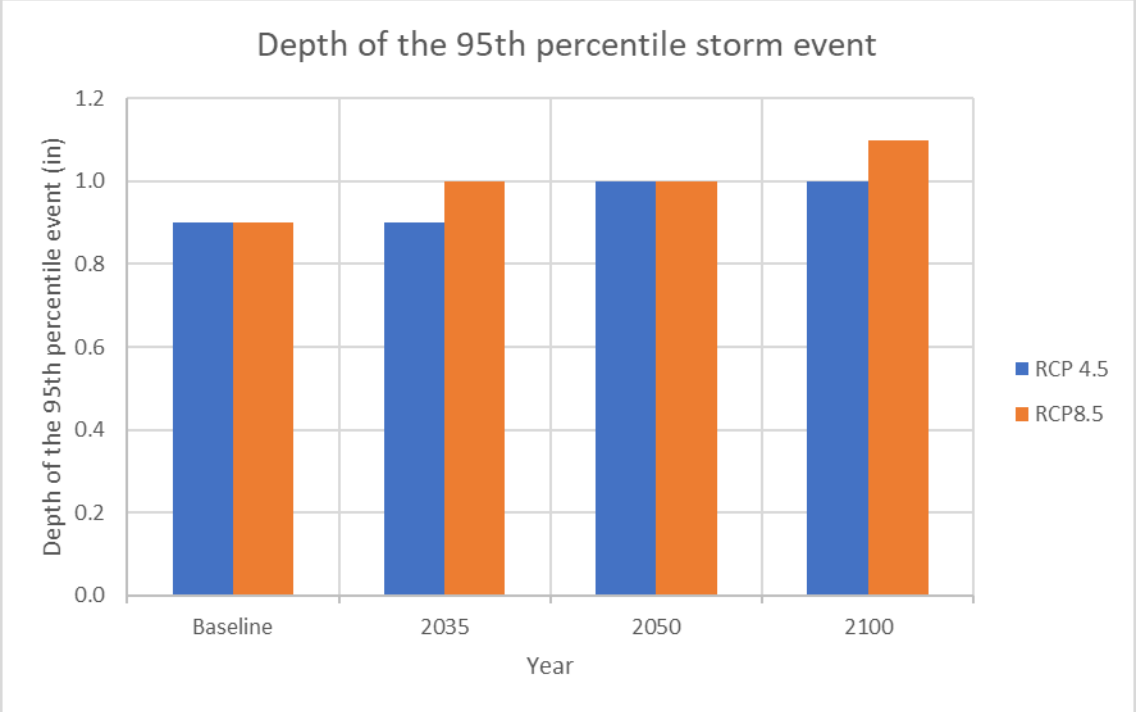


Figure 3-10. Future depth of the 95th-percentile storm event

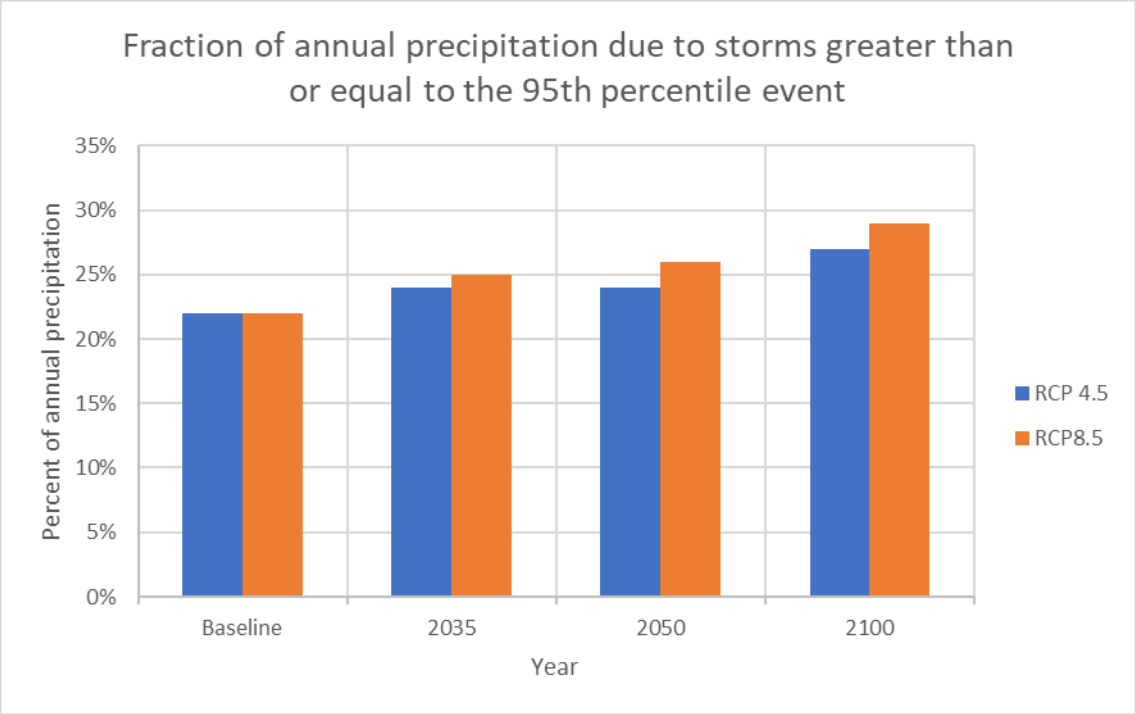


Figure 3-11. Fraction of annual precipitation due to storms greater than or equal to the 95th-percentile storm event

Return period events were estimated using larger windows for each future time horizon as shown in Table 3-2. The larger windows were selected in order to provide a larger sample size, which generally serves to improve the fit of the frequency analysis.

Table 3-2. Time Horizons for Future Conditions Frequency Analysis

Time Horizon	Period of Analysis
Baseline (Historical)	1950-2005
2035	1985-2035
2050	2000-2050
2100	2050-2100

Figure 3-12 and Figure 3-13 show the projected changes to return period storm depths for Montgomery County. Storm return period refers to average recurrence interval associated with a particular storm intensity and duration. For example, the 10-year, 24-hour storm has an average recurrence interval of 10 years and an annual probability of occurrence equal to 10% (1/10). The higher frequency events (1-year and 2-year storms) show very small increases in both scenarios and all time horizons, suggesting that the most common precipitation events will likely remain the same or increase slightly in total depth of rainfall. The less frequent events (10-year and 100-year storms) show somewhat greater increases, particularly in RCP8.5. As shown in Figure 3-12, the 100-year storm is projected to increase by 0.4 inches by 2050 and increase by 0.3 inches by 2100. This

apparent decrease in intensity can be explained first, by considering the greater uncertainty associated with predicting low-frequency storm events and second, by understanding that RCP4.5 considers a “stabilization” scenario, suggesting that both 2050 and 2100 are likely to show similar increases (0.3 to 0.4 inches) in the RCP 4.5 scenario. In contrast, RCP8.5 (Figure 3-13) shows a clear upward trend in the 100-year storm through the end of the century, when an approximately 8% increase is projected for Montgomery County.

It is important to note that the downscaled GCM precipitation output only provides simulated daily total values. Because of the Clausius-Clapeyron relation between temperature and pressure, as temperature increases the atmosphere can hold more moisture, which leads to higher-intensity events. Thus, while 24-hour higher-frequency storm events (1-year, 2-year, and 10-year) are not projected to increase significantly in total depth of rainfall, it is very likely that the way the sub-daily precipitation events will occur could result in increased flash flood risk. The time resolution of the FLEx model output does not provide the level of detail to quantify changes to short-duration (< 24-hour) rainfall intensities.

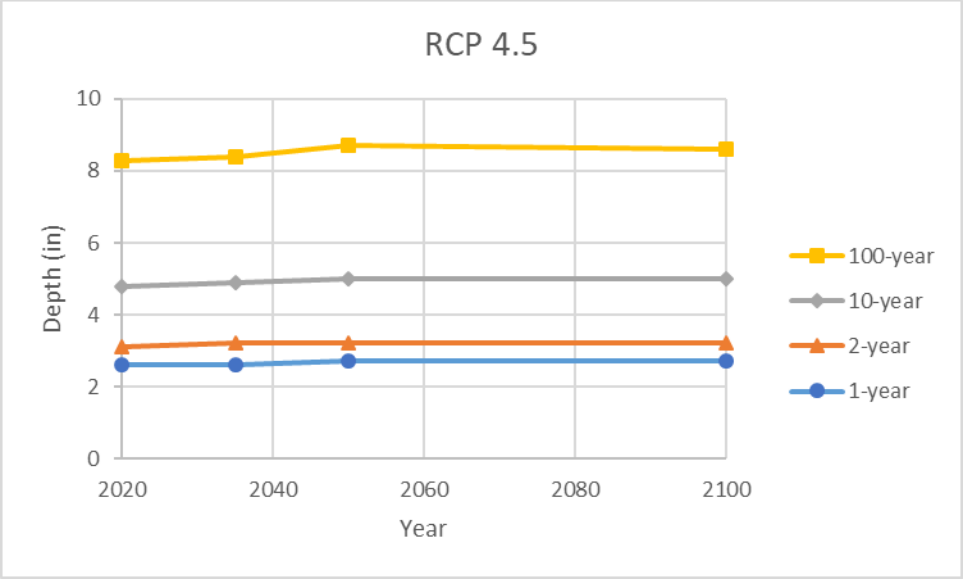


Figure 3-12. Future changes to return period storms (RCP4.5)

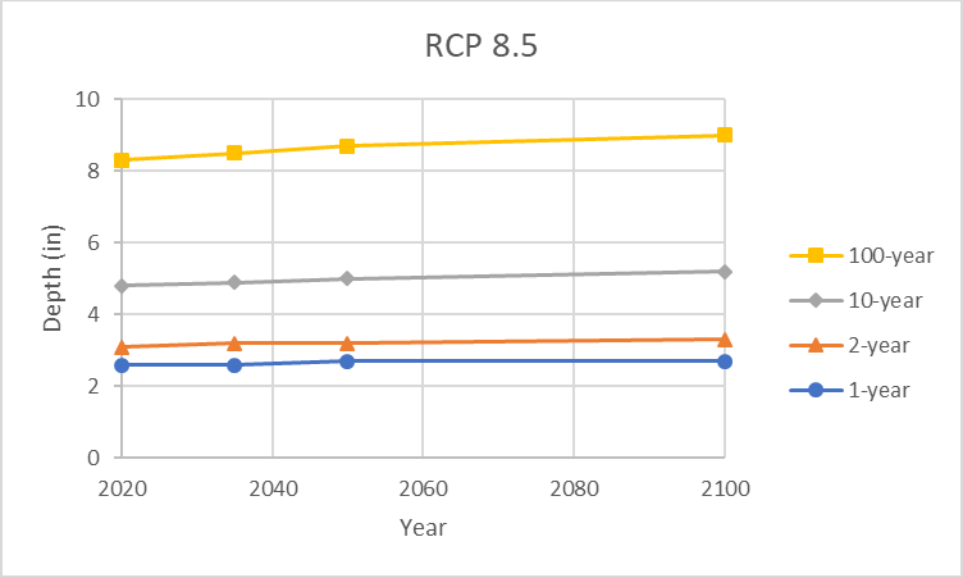


Figure 3-13. Future changes to return period storms (RCP8.5)

3.5 High Winds

Hurricanes, tornadoes, and derechos (straight-line wind events) could result in damage due to high-speed winds. These are not included in the FLEx tool outputs because of limited data of future wind speed predictions. Current wind data used for this analysis was based on the American Society of Civil Engineers' publication ASCE 7-16, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*. The document provides building design guidance regarding structural loads including winds. The guidance is available for the following four risk categories:

- Risk Category I – buildings and other structures that are a low hazard to human life in the event of failure (e.g., minor storage facilities)
- Risk Category II – buildings and other structures except those listed in the other risk categories (e.g., single-family dwellings)
- Risk Category III – buildings and other structures that represent a substantial hazard to human life in the event of failure (e.g., buildings with an occupant load great than 300 people, schools, and water treatment facilities)
- Risk Category IV – buildings and other structures designed as an essential facility (e.g., fire stations, police stations, designated emergency preparedness facilities, and aviation control towers)

The design wind speeds for Montgomery County are listed in Table 3-3.

Table 3-3. Design Wind Speeds for Montgomery County

Risk Category	Design Wind Speed
I	105 mph
II	115 mph
III	119 mph
IV	124 mph

Although a direct evaluation of future wind conditions was not performed as a part of this analysis, regional projections and recent observations suggest that hurricanes and tropical storms, which bring with them high winds, are expected to increase in both frequency and intensity.[6]

6 Dupigny-Giroux, L.A., E.L. Mecray, M.D. Lemcke-Stampone, G.A. Hodgkins, E.E. Lentz, K.E. Mills, E.D. Lane, R. Miller, D.Y. Hollinger, W.D. Solecki, G.A. Wellenius, P.E. Sheffield, A.B. MacDonald, and C. Caldwell, 2018: Northeast. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 669–742. doi: 10.7930/NCA4.2018.CH18.

3.6 Uncertainty and Spatial Distribution of Climate Hazards

In any robust analysis, it is necessary to consider possibilities for error and uncertainty. In general, extreme temperature and precipitation events involve significant uncertainty. Additionally, extreme precipitation is more difficult to represent in GCMs than extreme temperature due to limited observational data as well as the fact that model spatial resolutions are typically too coarse to resolve localized precipitation events.[7] Statistical downscaling uses historical spatial distributions of temperature and precipitation to improve GCM spatial resolution, though this approach is based on the fundamental assumption that the spatial distribution of past events is representative of the future.

Despite the limitations of climate models and the inherent uncertainty in projecting the future climate, the results of the future climate assessment remain an important window into a probable future for Montgomery County and provide an invaluable resource to guide planners and decisionmakers in preparing the community to face the certainly increasing climate hazards of the future.

In addition to the County-wide average climate statistics presented in Section 3.0 of this report, the statistically downscaled GCM output used in this analysis has high enough spatial resolution to provide a glimpse into the possible spatial distribution of climate hazards throughout the County. The following section (Section 4.0) includes several figures showing the spatial distribution of precipitation, temperature, and drought changes. Although this spatial data is useful for identifying especially vulnerable areas in the County at a high level, it is important to acknowledge that spatial distribution of precipitation can be highly variable and difficult to model and predict, while temperature projections are generally considered to be more reliable and spatially consistent.[8]

Statistically downscaled GCM output relies on finding historical high-resolution spatial distributions of precipitation and temperature on a local scale that are analogous to the low-resolution GCM output that is calculated on a global scale. In other words, historical spatial distributions of temperature and precipitation form the basis of these projections and, to some extent, limit the results. Using County-wide average values of the projected climate hazards is the preferred approach for avoiding a false sense of precision.

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7 Flato, G., J. Marotzke, B. Abiodun, P. Braconnot, S.C. Chou, W. Collins, P. Cox, F. Driouech, S. Emori, V. Eyring, C. Forest, P. Gleckler, E. Guilyardi, C. Jakob, V. Kattsov, C. Reason and M. Rummukainen, 2013: Evaluation of Climate Models. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

8 Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.). 2013. Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Available: https://www.ipcc.ch/report/ar5/wg1/. Accessed November 18, 2020.

4.0 Results of the Vulnerability Assessment

A typical natural hazard vulnerability assessment analyzes the threat to individual assets in three ways, by looking at: (1) exposure to the hazard, (2) sensitivity of the asset to that hazard, and (3) adaptive capacity of the particular asset. This vulnerability assessment is organized around the asset categories discussed in Section 2.0, and each asset category is assessed in regard to exposure, sensitivity, and adaptive capacity to each major natural hazard in the County. Assets are already exposed to these hazards; however, climate change is expected to intensify the severity of hazards.

The following sections describe the exposure of the assets to extreme precipitation, drought, and high winds. A discussion on sensitivity is also provided. In this report, sensitivity describes the capacity of the system to absorb impacts without suffering significant harm. Finally, the adaptive capacity of the asset is discussed. Adaptive capacity is the capability of the asset to cope with the hazard, for example through flexibility and redundancy to mitigate the negative impacts from the hazards.

4.1 Transportation

Hazard Exposure

Extreme Precipitation

The Federal Emergency Management Agency (FEMA) has modeled and mapped flood risks for the 100-year recurrence interval[9] and the Maryland-National Capital Park and Planning Commission (M-NCPPC) has mapped additional floodplains based on smaller basin sizes than in the FEMA study. Based on the existing floodplain data, there are approximately 1,600 road crossings over these floodplains with the County. The Maryland Department of Transportation (MDOT) keeps a database of frequently flooded roads, which includes 18 locations within the County (pictured in Figure 4-1) along with other known frequently flooded roads and the floodplains. Changes to the 10-year, 24-hour and 100-year, 24-hour return period storms are shown in Figure 4-2 and Figure 4-3, respectively. In general, extreme precipitation events are projected to increase in intensity, with the greatest increases corresponding to the most extreme events. Therefore, in the absence of corrective measures, more flooded road crossings, and more frequent and longer-duration road closures, are expected. Table 4-1 lists Ride On bus routes and bikeways that are also currently impacted by stormwater flooding. Localized flooding can disrupt operation of all modes of transport.

9 Federal Emergency Management Agency, 2006. Flood Insurance Study: Montgomery County, Maryland And Incorporated Areas.

Table 4-1. Ride On Bus Routes and Bikeways Impacted by Frequently Flooded Roads

Ride On Bus Routes Impacted by Frequently Flooded Roads
8-Silver Spring-Wheaton
10-Twinbrook Station-Hillandale
21-Silver Spring-Briggs Chaney P&R
22-Silver Spring-Hillandale
26-Montgomery Mall-Glenmont
29-Bethesda-Glen Echo-Friendship Hghts
33-Glenmont-Medical Center
34-Aspen Hill-Friendship Heights
36-Bethesda-Potomac-via Hillandale
38-Wheaton-White Flint Station
48-Wheaton-Rockville
52-Olney-Mont. General Hosp.-Rockv.
53-Shady Grove-Glenmont
61-Shady Grove-Germantown Transit
71-Shady Grove-Kingsview P & R
75-Clarksburg Correctional-Germantown
78-Shady Grove-Kingsview P & R
90-Shady Grove-Damascus
L8-Aspen Hill-Friendship Heights
T2-Rockville-Friendship Heights
Bikeways Impacted by Frequently Flooded Roads
Beach Drive
Blue Mash Trail
Bradley Blvd
C & O Canal Towpath
Connecticut Ave
Dennis Ave
Emory Ln
Falls Rd
Frederick Rd
Glenhaven Dr
Gold Mine Rd
Gridley La
ICC Trail
Riffle Ford Road
River Rd
Rock Creek Trail
Sligo Creek Trail
Veirs Mill Rd

Extreme Heat

The transportation system within Montgomery County will be exposed to extreme heat. Figure 4-4 shows the increase in the number of days in a year that are expected to be above 95°F for the years 2035, 2050, and 2100. The RCP4.5 and 8.5 scenarios are presented to see the projected range for these projections. Direct exposure to hot ambient temperatures has a negative impact on assets and people.

Drought

Drought is not considered a notable hazard to transportation assets.

High Winds

Transportation assets will likely have increased exposure to high winds and the effects thereof. All modes can be affected, but especially public, private, and military airports in the County

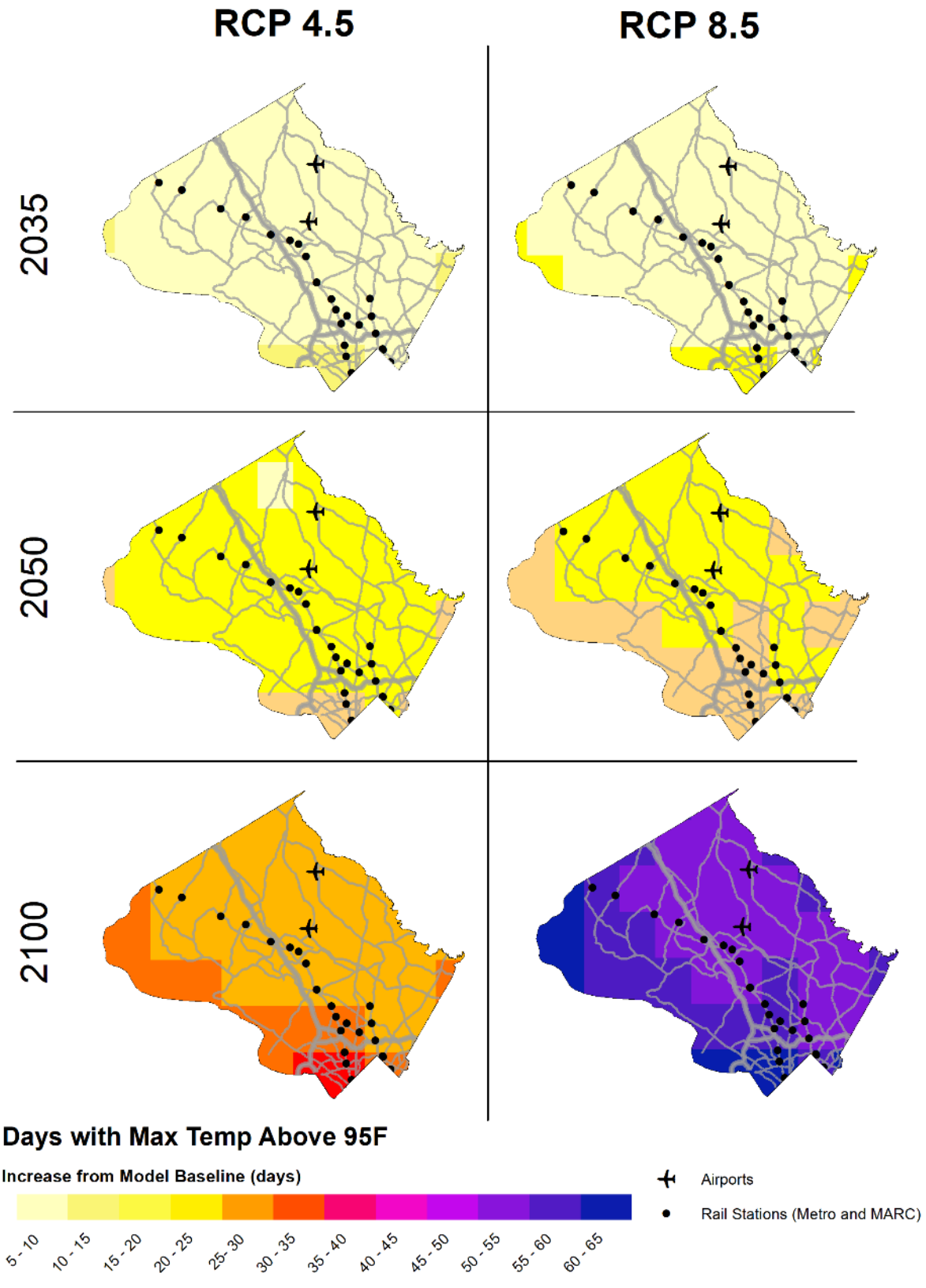
RCP 4.5
RCP 8.5
2035
2050
2100
Days with Max Temp Above 95F
Increase from Model Baseline (days)
5 - 10
10 - 15
15 - 20
20 - 25
25 - 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
Airports
Rail Stations (Metro and MARC)

Figure 4-4

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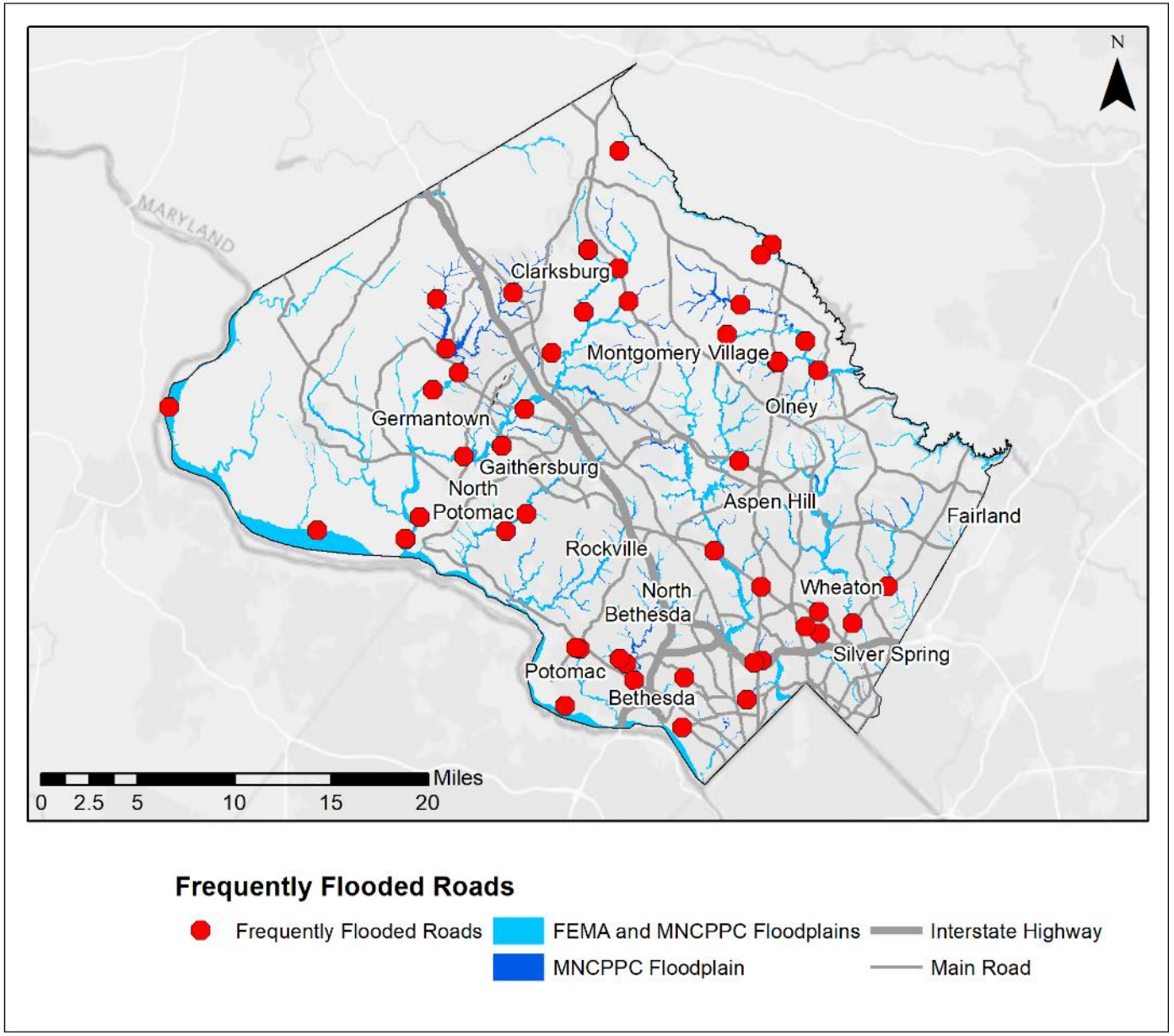

Figure 4-1 Frequently flooded roads with FEMA and M-NCPPC floodplains

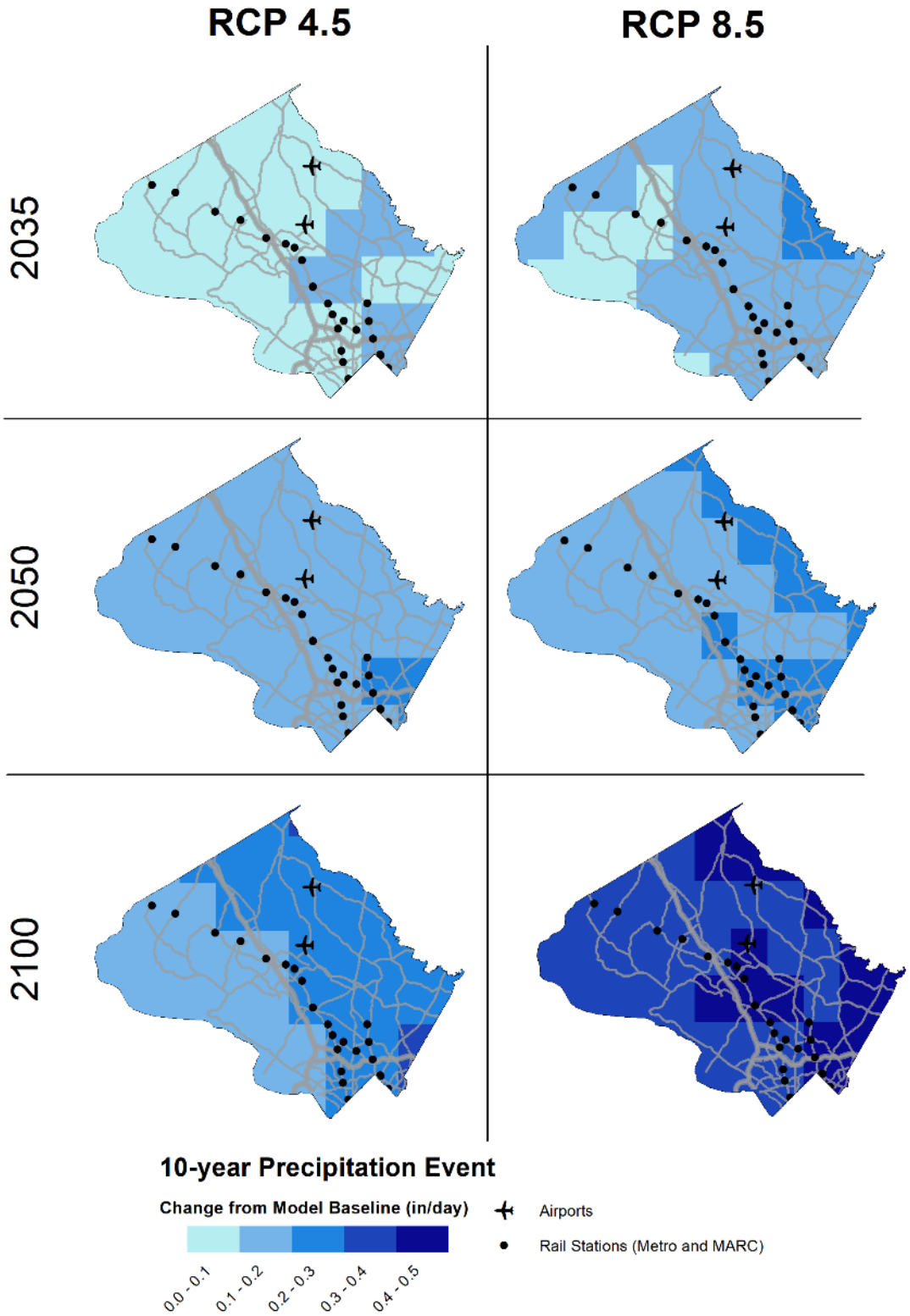

Figure 4-2. Change over the baseline for the 10-year rainfall event for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for transportation assets

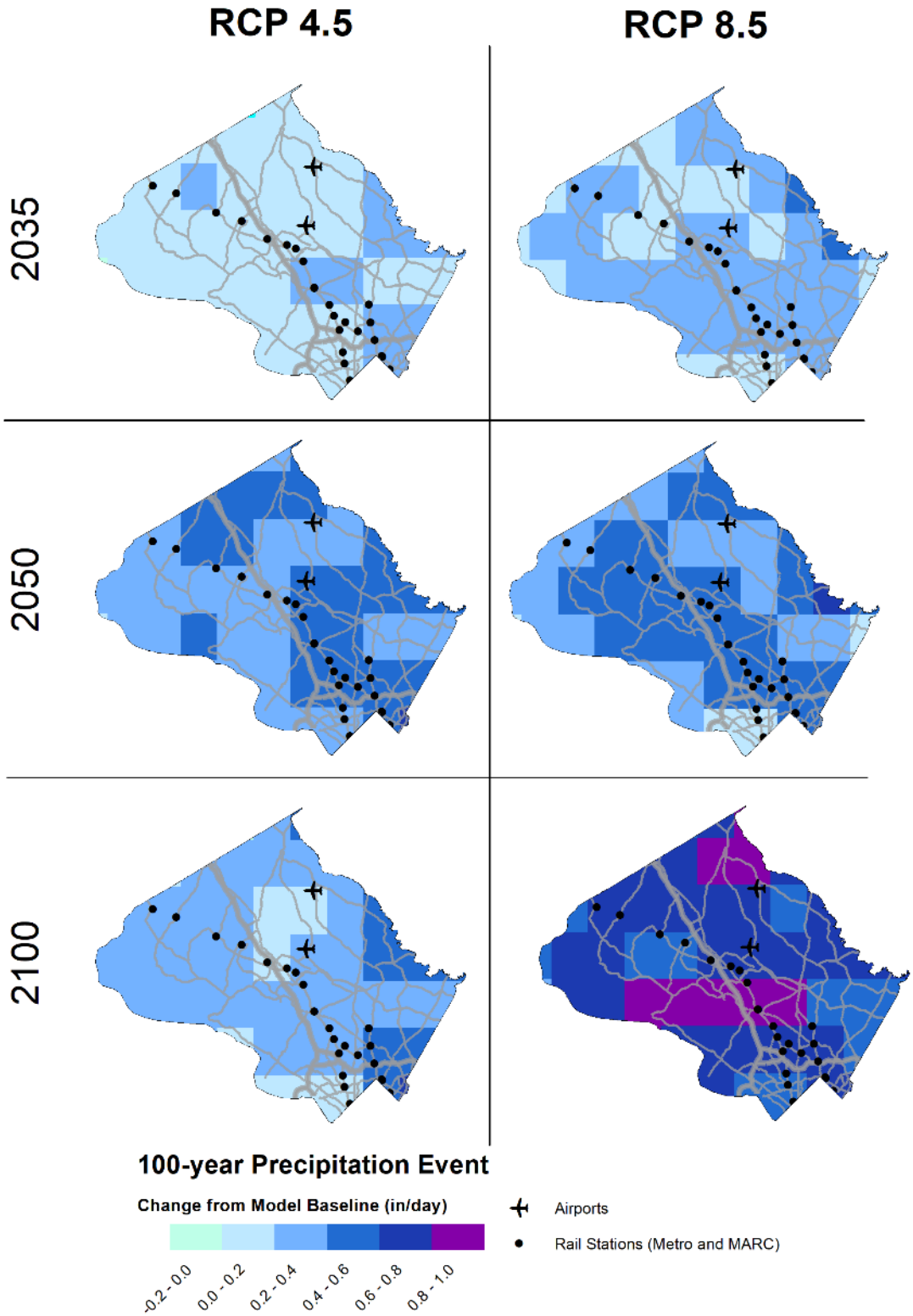

Figure 4-3 Change over the baseline for the 100-year rainfall event for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for transportation assets

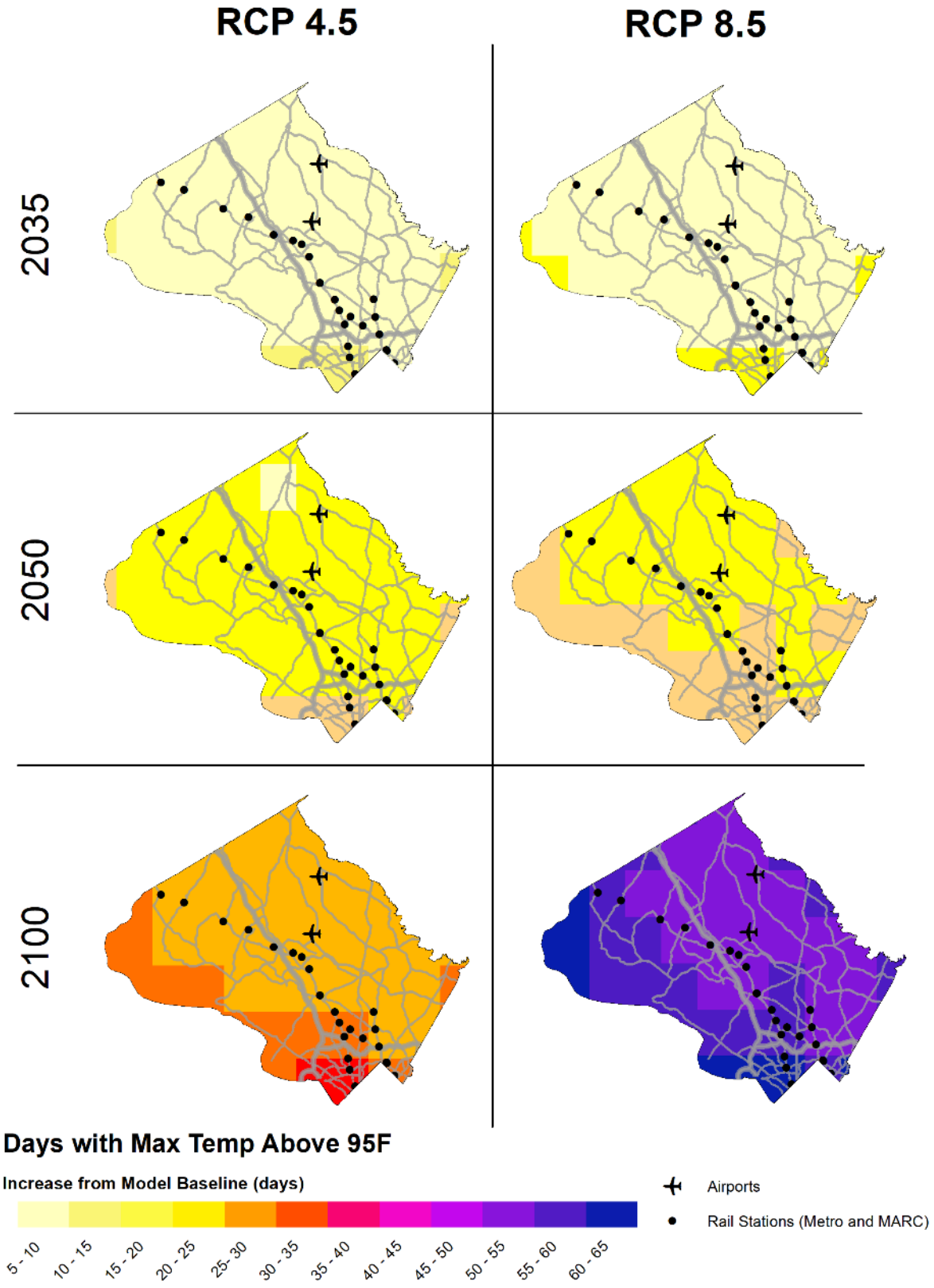

Figure 4-4. Increase in the number of days >95°F per year for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5), showing roads, airports, and rail stations

Sensitivity

Floods can wash out roads, bridges, and other structural components, forcing detours that can cause congestion and traffic delays, impacting the overall function of the system. Increased frequency and intensity of flooding events will likely have a compounding impact that will decrease the service life of structural system components over time. Electrical components are particularly sensitive to flooding and, if exposed, can create deadly hazards and lengthy system interruptions to public transportation. Post-event debris cleanup is costly and time consuming. Driving through floodwater is dangerous and results in deaths for dozens of people in the U.S. annually.[10] Flooded bike paths significantly affect bike commuters, and may expose riders when they use detours along congested and dangerous roads.

During a storm that took place on July 8, 2019, Montgomery County Fire and Rescue Services carried out more than 60 water rescues. One of the incidents involved a washed out roadway that stranded a community in Potomac.

Source: *https://wjla.com/news/local/several-active-water-rescues-underway-in-montgomery-co*

Extreme heat can result in unsafe aircraft operations and the closure of airports. At very high temperatures, asphalt roads soften, concrete roads can crack apart, and train rails expand and buckle. Extreme heat can make bus and train stops uncomfortable or even dangerous for people waiting to take public transportation and may exacerbate health conditions. Transportation employees that are frequently required to work outdoors to perform construction, operations, and maintenance may be limited or unable to perform their duties. In general, more power will be used for air conditioning in airports, buses, and trains, and consistently higher demands on these systems will result in increased maintenance costs and possibly failures. High temperatures could make bike commuting unsafe.

High winds can stop bus and rail traffic, cause downed trees to block streets and bike routes, and make driving hazardous. Neither bus nor rail will be operating during tropical cyclones, which will be more frequent and severe; therefore, there will be impacts on service and revenue. These events may disrupt operations at the public, private, and military airports in the County, as well as heliports, which could impact medical emergency transport to hospitals. High winds affect sustainable forms of mobility such as bicycling and walking.

Transportation assets are not sensitive to drought.

Adaptive Capacity

Some areas of the County transportation network have little or no adaptive capacity where flooding of streams and insufficient drainage capacity associated with extreme precipitation events is a problem even in existing conditions. Retrofitting existing structures and adjusting design requirements of new structures can improve the system's ability to adapt to increased precipitation. Adaptive capacity also includes efficient detours for flooded roads and sheltered waiting areas that keep temperatures lower and minimize sun exposure for transit users on high heat days. Transportation workers may need to adjust schedules to work nights and early mornings, when temperatures will be lower.

10 Driving flood fatalities for 2010-2020. Available: https://www.weather.gov/arx/usflood

4.2 Critical and County Resources

Hazard Exposure

Extreme Precipitation

Of the 435 buildings included as critical and County resources, none of the structures are in the FEMA floodplain. However, as extreme precipitation increases, expansions of the floodplain are likely. Although this vulnerability assessment did not estimate the extent of floodplains in the future, the current floodplain was buffered by 500 feet to identify buildings close enough that could potentially be impacted by an expanded floodplain.[11] This information is provided in Table 4-2. A map of the critical and County resources within the floodplain or up to 500 feet from the floodplain is shown in Figure 4-5.

Table 4-2. Critical and County Resources within 500 feet of the FEMA Floodplain

Critical and County Asset Types	Total Structures	Buildings within 500 feet of FEMA Floodplain
High Schools	25	1
Middle Schools	40	2
Elementary Schools	135	8
Recreation Centers	42	3
Libraries	24	0
HHS Nursing Homes	34	4
Police Stations	6	2
Fire Stations	38	4
Hospitals	10	3
Emergency Shelters	28	0
Multi-Agency Buildings	53	1
TOTAL	**435**	**28**

Overland flooding caused by drainage deficiencies is also a potential risk for critical and County assets as extreme precipitation increases. This type of flooding is closely tied to the stormwater management system, but buildings that are in areas of the County with the highest projected increase in extreme precipitation are more likely to experience overland flooding. The change over the baseline for the 10-year and 100-year rainfall events for three future years and two climate scenarios is shown in Figure 4-6 and Figure 4-7, respectively.

11 Note: This analysis does not consider topography and likely overestimates the number of assets that may be impacted by riverine flooding.

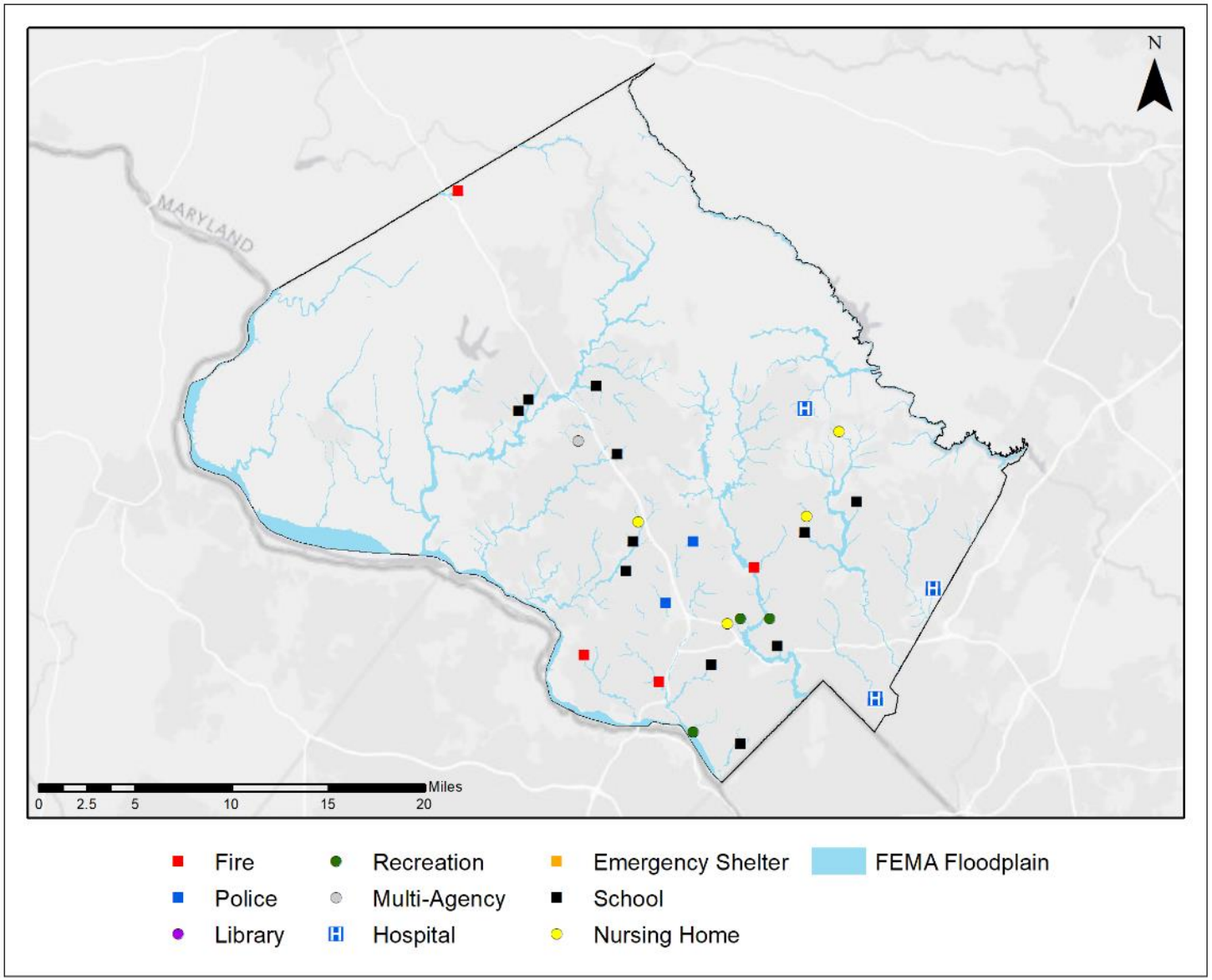

Figure 4-5. Critical and County resources within 500 feet of the FEMA floodplain

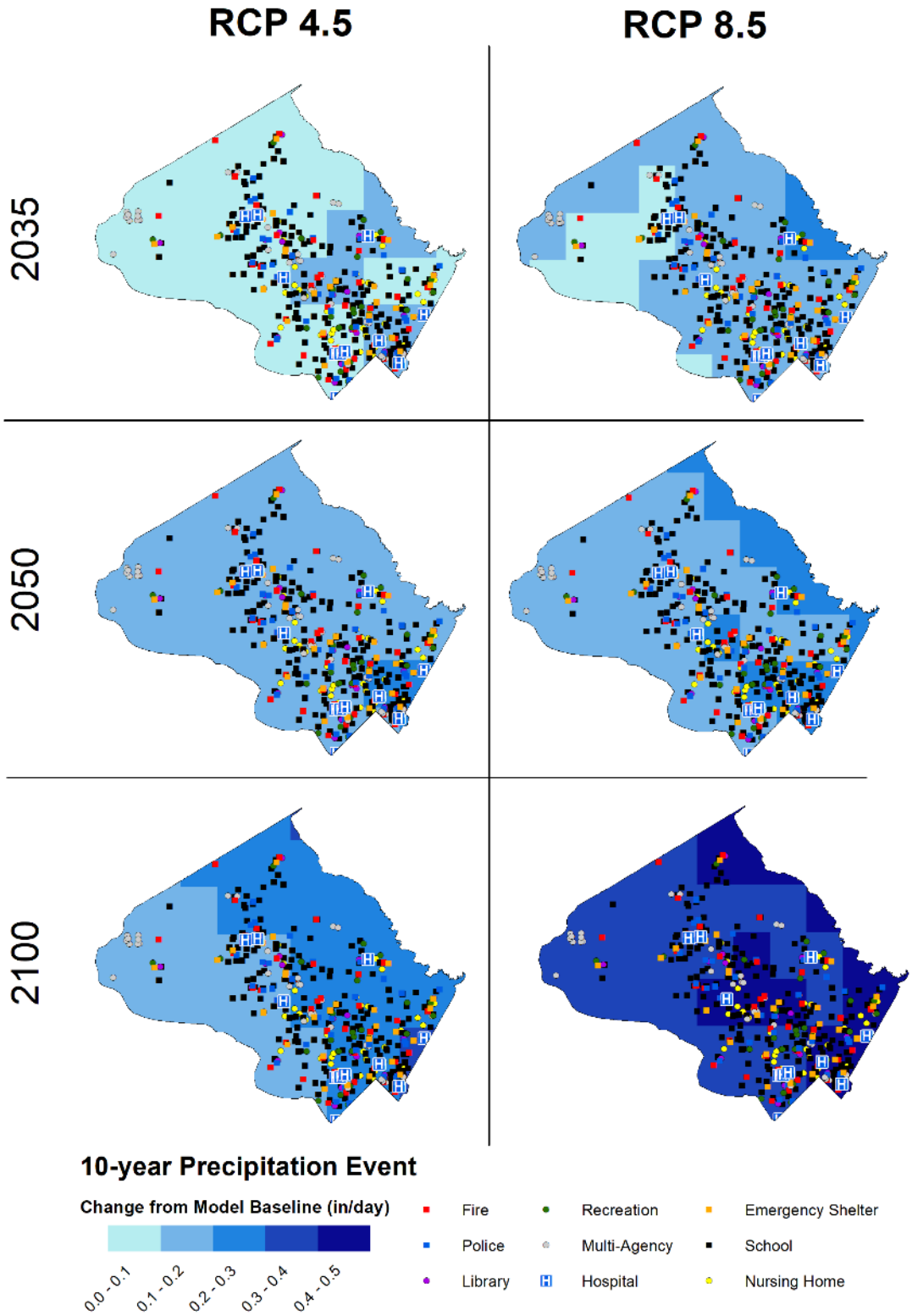

Figure 4-6. Change over the baseline for the 10-year rainfall event for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for critical and County resources

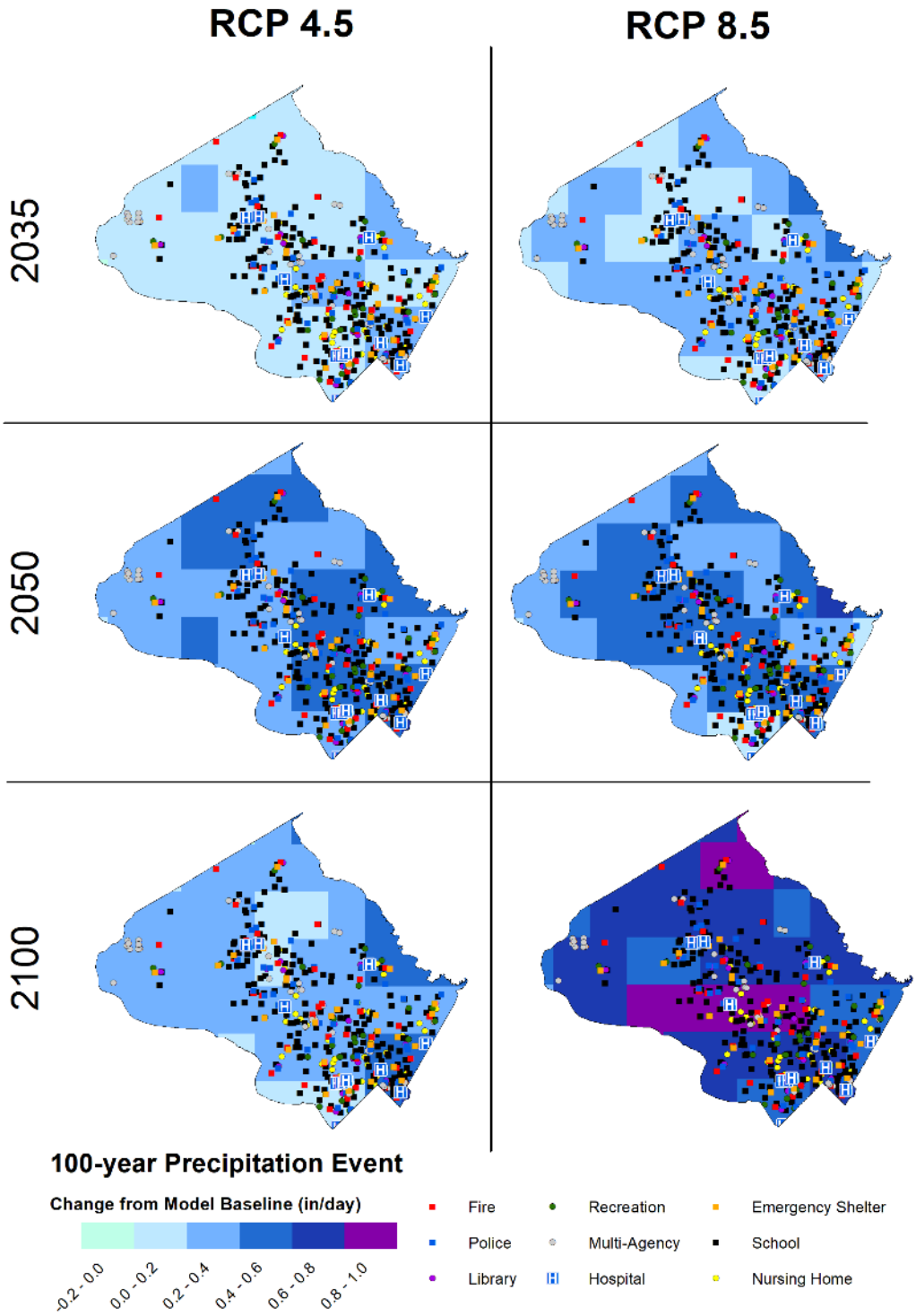

Figure 4-7 Change over the baseline for the 100-year rainfall event for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for critical and County resources

Extreme Heat

Extreme heat exposure is projected to increase Countywide. Critical and County assets considered in this category are buildings that in themselves provide shelter from extreme temperatures, so extreme heat is not considered to be a notable hazard.

High Winds

Critical and County resources will likely experience increased exposure to high winds and the effects thereof.

Drought

Droughts are projected to increase in frequency and severity and may significantly impact the operations of many critical and County assets such as hospitals, nursing homes, and schools.

Sensitivity

Critical and County resources are sensitive primarily to flooding, as this hazard can cause the most damage to buildings. In cases of the critical buildings (such as hospitals, fire stations, etc.), closure could be catastrophic to County members in need of these services.

Buildings are only sensitive to high heat in that they will need more robust air-conditioning systems to maintain comfortable temperatures inside. If the HVAC system fails during times of high temperature, the building will not be usable, and temperatures could impact technology systems (computers, servers, etc.) stored within the buildings.

Though the buildings themselves will not be particularly sensitive to drought, the primary functions of many critical and County resources will be significantly impacted by drought conditions, as patients, students, and workers will need access to drinking water. As a result, these assets are considered highly sensitive to drought.

Buildings within Montgomery County are designed to withstand high winds. High winds are not likely to significantly damage buildings that have been built to code, but with increasing frequency and severity of high wind events, sensitivity may increase in the future. Building access can also be sensitive to downed trees, and downed powerlines may render the building unusable for a time.

Adaptive Capacity

The critical and County resource buildings have some redundancy throughout the County. Multiple hospitals, libraries, and recreation centers exist throughout the County, though capacity is finite. Students from one school may be able to move to another building if one is closed for a natural hazard-related reason as periodically occurs when facilities close temporarily for renovations. Remote learning options are also available, as has been demonstrated in the 2020 COVID-19 pandemic. However, for some critical resources, there could be a dramatic difference, such as in the outcome of a fire if the nearest fire station is inoperable and a station that is farther away has to be called into action. In general, though, there is some adaptive capacity built in to the critical and County resources. There may be a need for expanded hours for emergency shelters and other buildings that serve as cooling centers. The emergency shelter locations are shown in Figure 4-8.

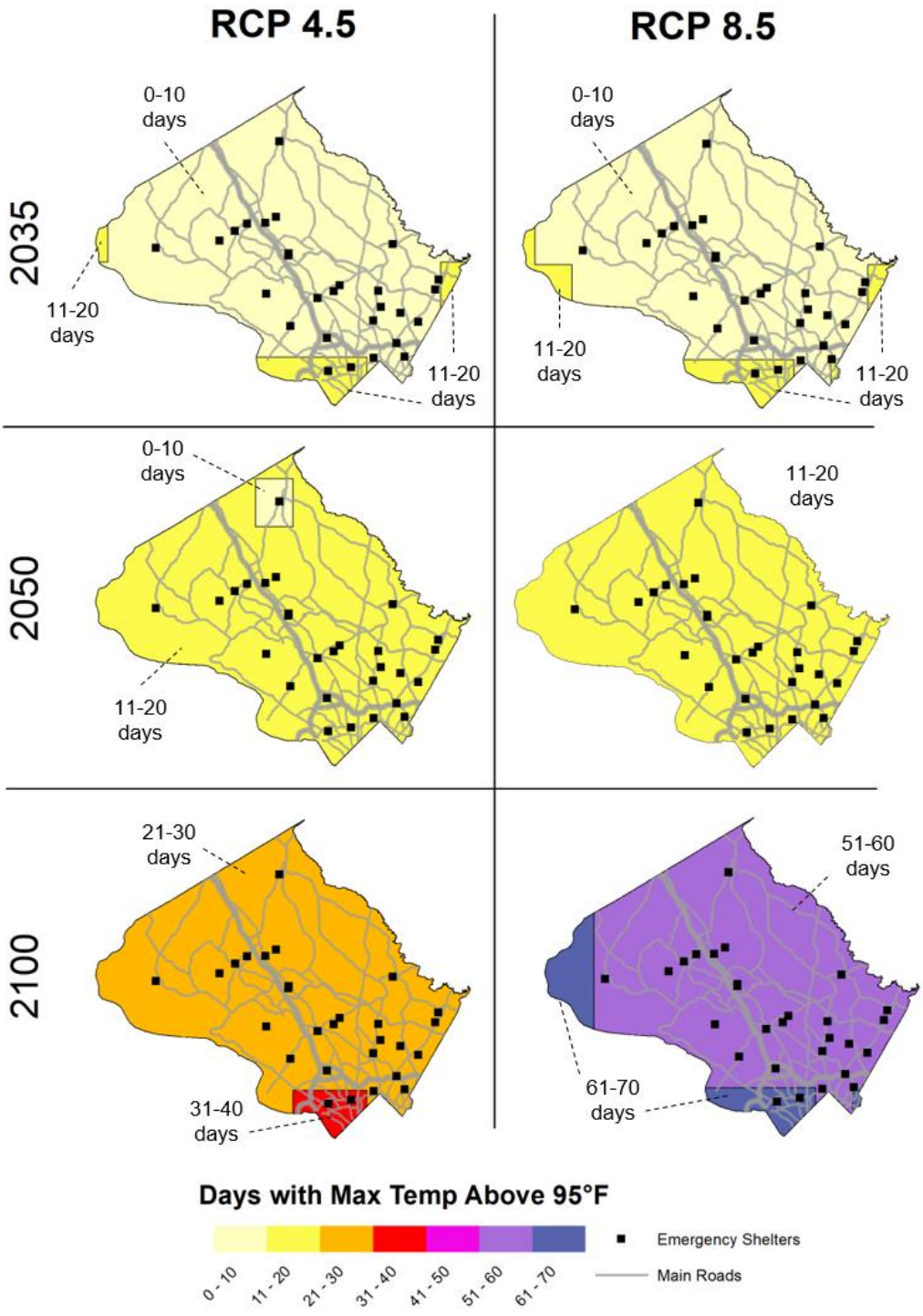

Figure 4-8. Increase in the number of days >95°F per year for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for emergency shelters

4.3 Utilities

Hazard Exposure

Extreme Precipitation

The FEMA floodplain was buffered by 500 feet to see how many assets would be impacted by an expanded floodplain.[12] This information is provided in Table 4-3.

Table 4-3. Utility Assets within 500 feet of the FEMA Floodplain

Utilities Asset Types[13]	Total Structures	Buildings within 500 feet of FEMA Floodplain
Substations	89	14
Pump Stations (Rockville only)	3	1
TOTAL	**92**	**15**

In addition to the substations and pump stations listed in the table above, the Montgomery County Resource Recovery Facility was found to be within 500 feet of the FEMA floodplain. Drinking water reservoirs that serve the County will experience increased frequency and intensity of extreme precipitation. The change over the baseline for the 10-year and 100-year rainfall events for three future years and two climate scenarios are shown in Figure 4-9 and Figure 4-10, respectively.

Extreme Heat

Utility assets will be increasingly exposed to extreme temperatures and heat waves. Highly exposed asset subgroups such as substations, power lines, and drinking water reservoirs will unilaterally be subjected to significantly longer periods of extreme heat.

Drought

Drought exposure is primarily of concern for the drinking water systems and wastewater collection systems. Droughts have occurred in recent years, and future projections indicate increases in drought frequency and severity. Projected increases in severe droughts are shown in Figure 4-11.

High Winds

Power distribution is primarily impacted by high wind exposure to overhead lines and damage from fallen trees. Exposure to high winds is projected to increase in the future.

12 Note: This analysis does not consider topography and likely overestimates the number of assets that may be impacted by riverine flooding.

13 Note: There are other infrastructure assets that could be exposed to flooding; however, power substations and the pump stations in Rockville are the ones for which information was available and used for this assessment.

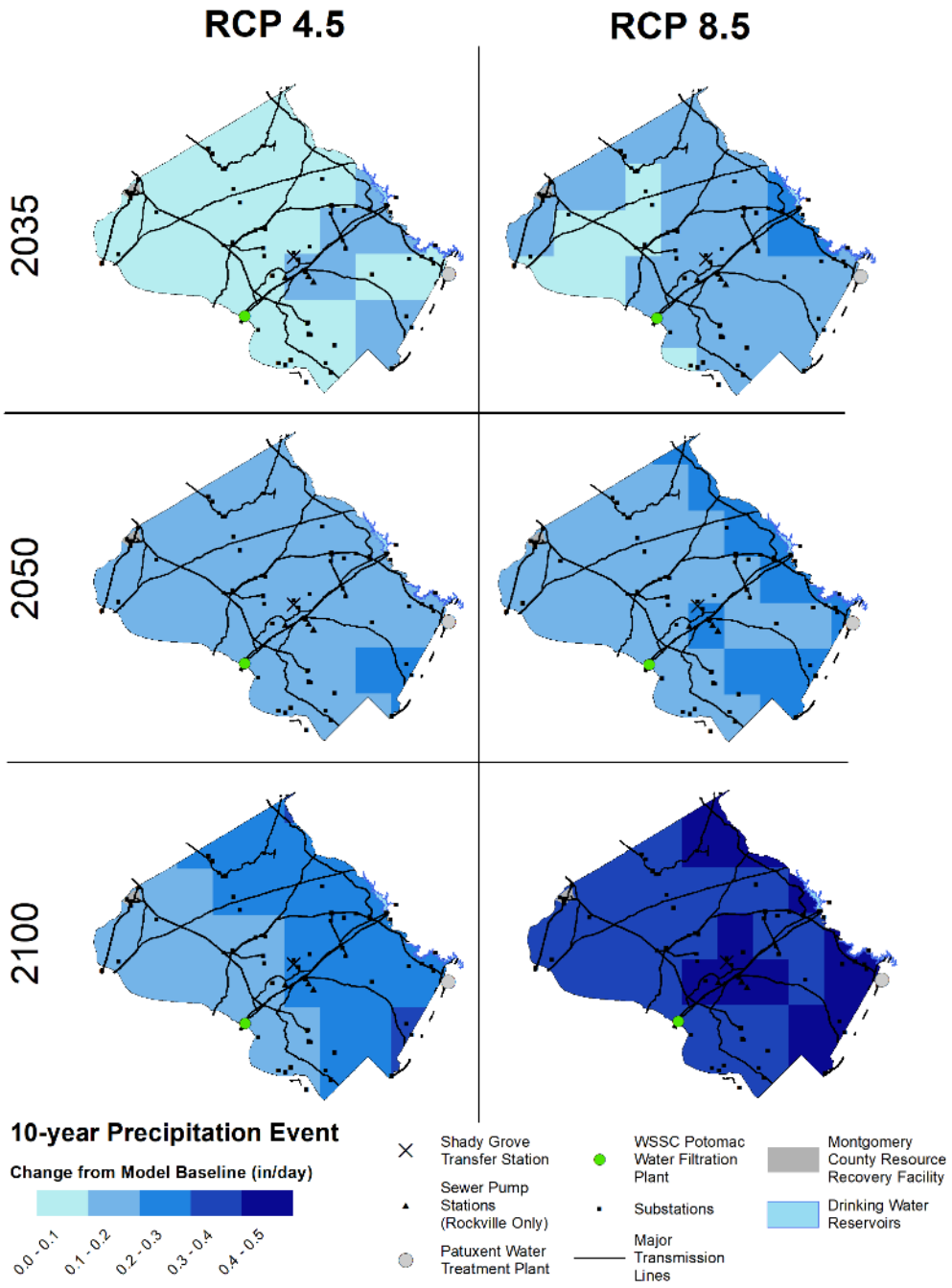

Figure 4-9. Change over the baseline for the 10-year rainfall event for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5)

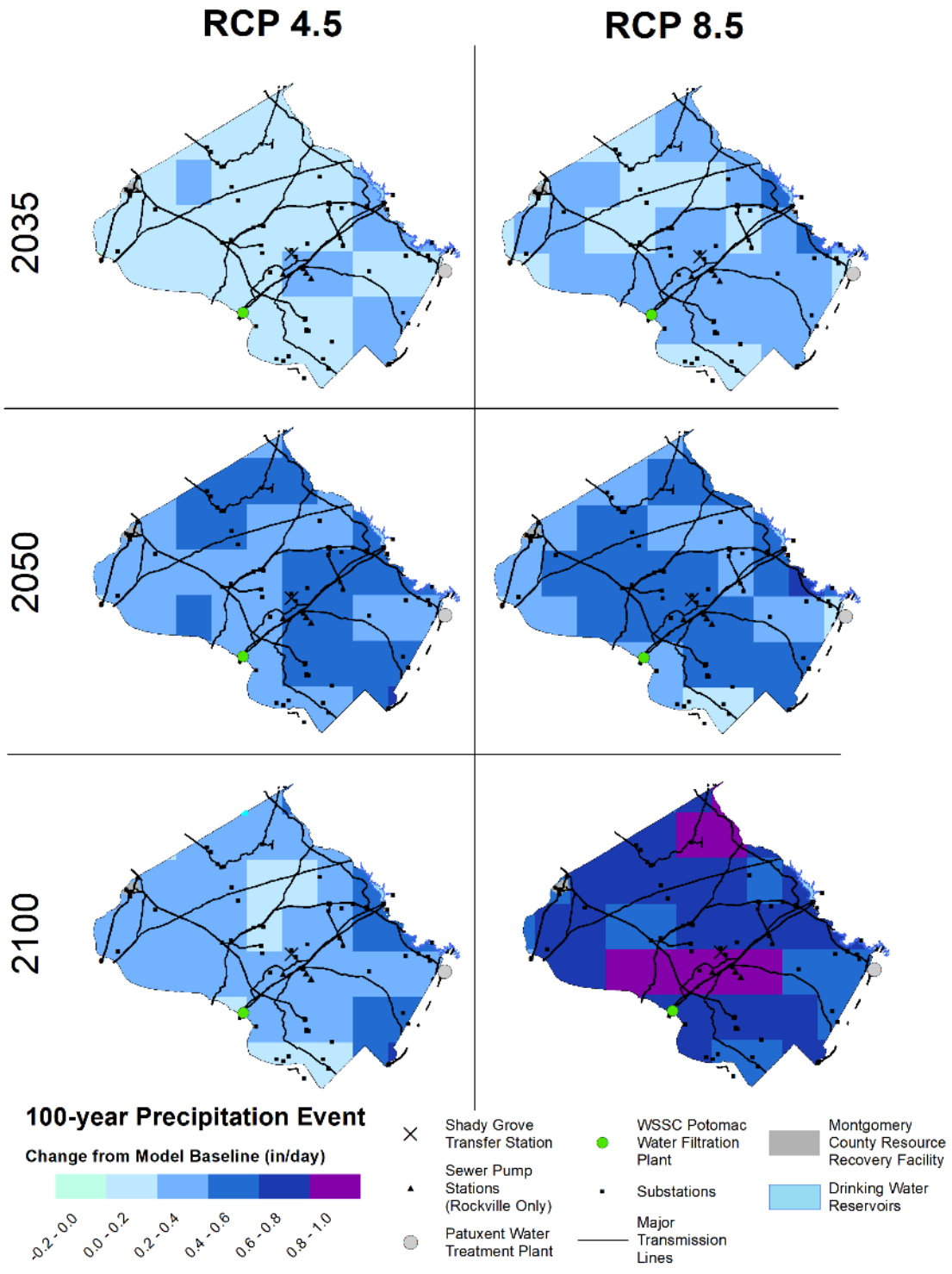

Figure 4-10. Change over the baseline for the 100-year rainfall event for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5)

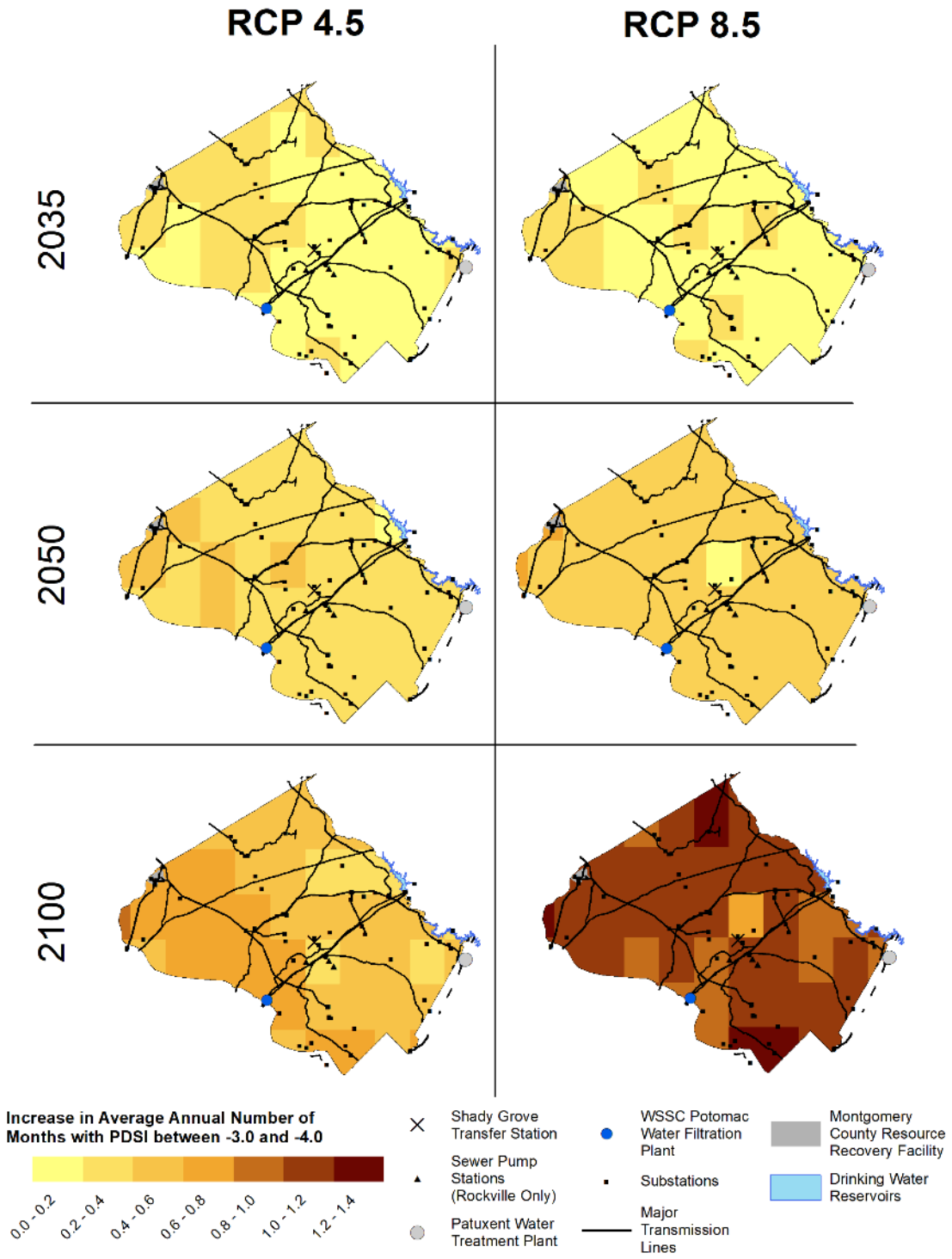

Figure 4-11. Changes to average number of severe drought (PDSI between -3.0 and -4.0) months per year for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5)

Sensitivity

Electrical components of utility assets are very sensitive to flooding and extreme precipitation. Extreme precipitation events can also impact the operations of drinking water reservoirs, which, depending on available storage, may become very sensitive to additional precipitation. Although unlikely, extreme precipitation could impact the stability of the Brighton Dam or the T. Howard Duckett Dam on the Patuxent River, increasing the risk of a catastrophic failure and devastation downstream. Failure of these dams would also impact the supply of drinking water for the County. Intense rainfall can create challenges for water filtration plants and may cause larger flows in wastewater collection and treatment facilities, which could lead to backflows and overflows, as well as impacts on the treatment processes.

Power lines and other open-air electrical components are sensitive to extended extreme heat exposure, which can compound with existing system heat generation, cause thermal expansion, degrade protective layers, and significantly exacerbate small system imperfections, which can lead to failures and power outages. Extreme heat also increases evapotranspiration and can add additional stress to drinking water resources.

Drinking water systems are particularly sensitive to extended periods of drought. Although drought-triggered water restrictions in the region are uncommon, increased frequency and severity of droughts may lead to increased frequency and severity of the corresponding restrictions. Drought can also impact wastewater systems as sediment accumulation increases with low system flows. Generation of gas in pipe networks due to low flows and increased temperatures could become a health and safety hazard.

During high wind events, open tanks and filter beds in water treatment plants can be blown out, mechanical equipment and electrical power and controls can be damaged, and the treatment process and finished water storage can become contaminated by debris on treatment plant sites. Facility access can also be interrupted or restricted due to debris and damaged roads. Piping and appurtenances (e.g., fire hydrants, valves, and stream crossings) can suffer airborne debris impacts. They can also be damaged if nearby buildings are damaged or destroyed. Severe water and pressure loss can occur due to ruptured service lines. Also, high winds can down power lines and trees, resulting in power outages.

Adaptive Capacity

Vulnerable utility assets can be raised or floodproofed, and installing submersible pumps where needed can mitigate flood risks and provide adaptive capacity. Correcting infiltration and inflow problems in piping systems can reduce flows to the treatment plant during extreme precipitation events.

During drought periods, the drinking water system has historically been able to manage water supply needs effectively through upstream resources as well as voluntary restrictions in the region. But as droughts become more frequent and more severe, additional water conservation actions will be necessary.

Utility companies can do many things to adapt to high winds. If needed, they can retrofit buildings to meet building code requirements, anchor or relocate rooftop equipment, and build protective structures around critical equipment to reduce the possibility of puncture by windborne projectiles. The electric system has limited adaptive capacity in the face of high winds and downed powerlines. An effective adaptation measure is to bury all overhead utilities, which can be done gradually as part of new development and re-development projects.

4.4 Stormwater Management System

Hazard Exposure

Extreme Precipitation

Increased precipitation, especially short and intense storms, can lead to significant hazard exposure. The map of the stormwater management system along with images of nearby buildings shows how important this system is for keeping the roads and nearby buildings dry. In order to further identify stormwater assets that may experience high exposure to extreme precipitation, National Weather Service (NWS) flood reports as well as the MDOT frequently flooded roads were buffered by 500 feet to see how many of the 12,096 assets considered would be impacted by stormwater flooding[14] as shown in Table 4-4. The previously flooded area locations are shown in Figure 4-12 along with the corresponding precipitation event associated with the flooding (for NWS reports). Figure 4-13 shows the changes to the 10-year, 24-hour storm projected for the future.

Table 4-4. Stormwater Management Assets within 500 feet of NWS Flood Reports and MDOT Frequently Flooded Roads

Stormwater Management Asset Types	Total Structures	Buildings within 500 feet of Previously Flooded Areas
Culvert	2,560	45
Dry Well	5,798	48
Infiltration Trench	1,086	2
Underground Detention	619	3
Pond (Wet/Dry)	1,227	4
Swale/Bioswale	806	1
TOTAL	**12,096**	**103**

Sensitivity

The stormwater management system is particularly sensitive to increased rainfall. Undersized pipes or decreased flow due to sediment or debris can cause choke points, which leads to extensive flooding and the need for post-storm maintenance and repair. Stormwater management ponds can be overtopped, and bioretention facilities can be washed out.

Stormwater management assets are not directly sensitive to drought, extreme heat, or high winds. However, high temperatures can reduce water quality and impact downstream assets. Sediment can accumulate in stormwater conveyance during a drought and block flow when it rains again. Extended drought conditions can kill plants in green infrastructure stormwater controls. Additionally, high winds can carry debris, causing blockages, asset damage, and possibly blowing out vegetation and soil from green infrastructure.

14 Note: This analysis does not consider topography or historical ponding extents and may overestimate or underestimate the number of assets that are impacted by stormwater flooding. It does, however, provide some sense of the potential current and future risks.

Adaptive Capacity

The stormwater management system has limited adaptive capacity, particularly as storms become more intense in the future, and the existing system is under-designed. Conveyance may be over-dimensioned as a safety factor, creating inherent additional storage in the stormwater collection network. As upgrades are made and new components are added, there is a chance to design for future conditions, which would provide adaptive capacity. Green infrastructure adds adaptive capacity to the system by decentralizing stormwater management and spatially distributing the amount of storage available for runoff capture. Regular and comprehensive maintenance and debris removal can significantly improve system performance and maximize inherent adaptive capacity.

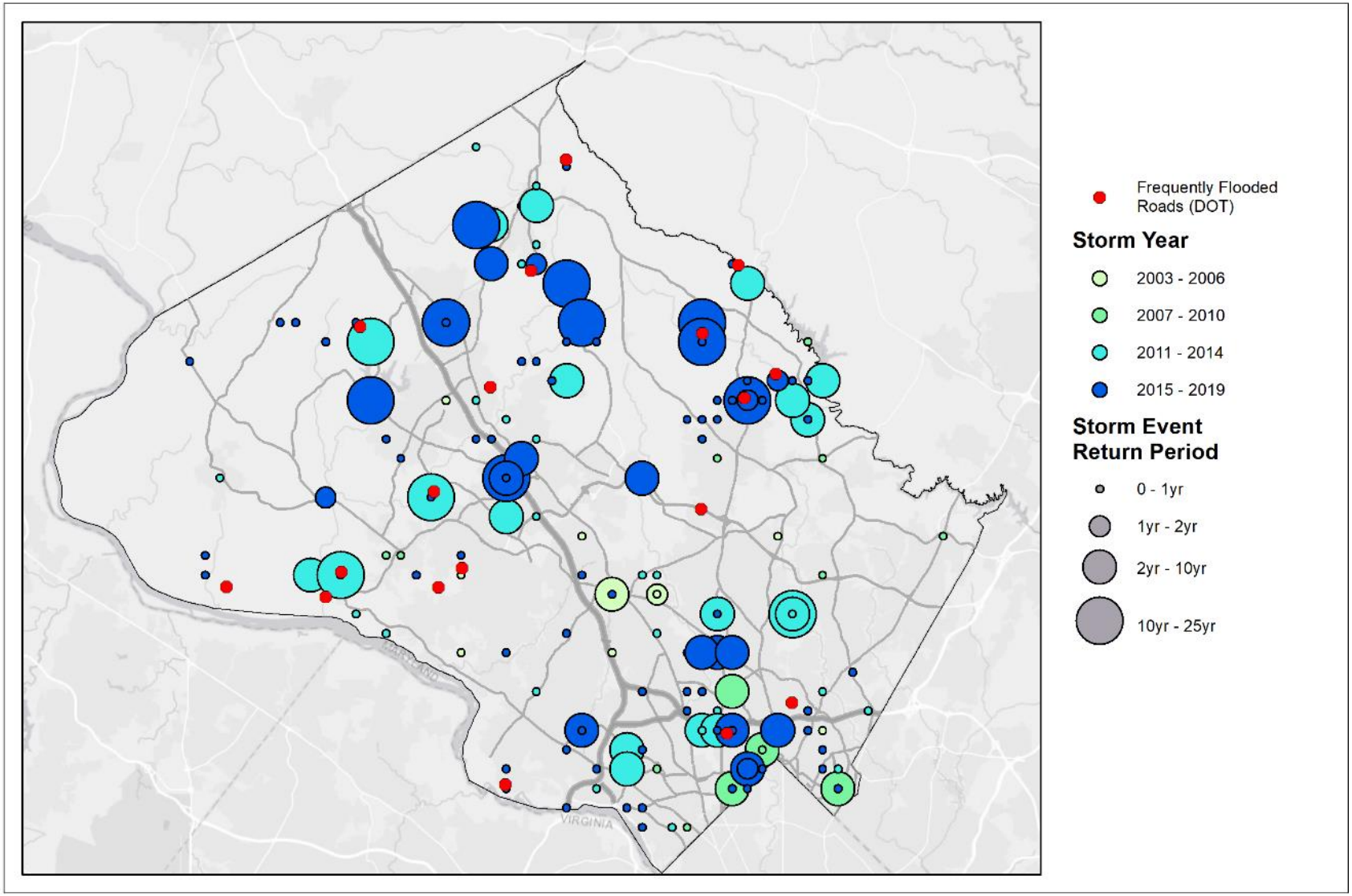

Figure 4-12. NWS flood reports and MDOT frequently flooded roads

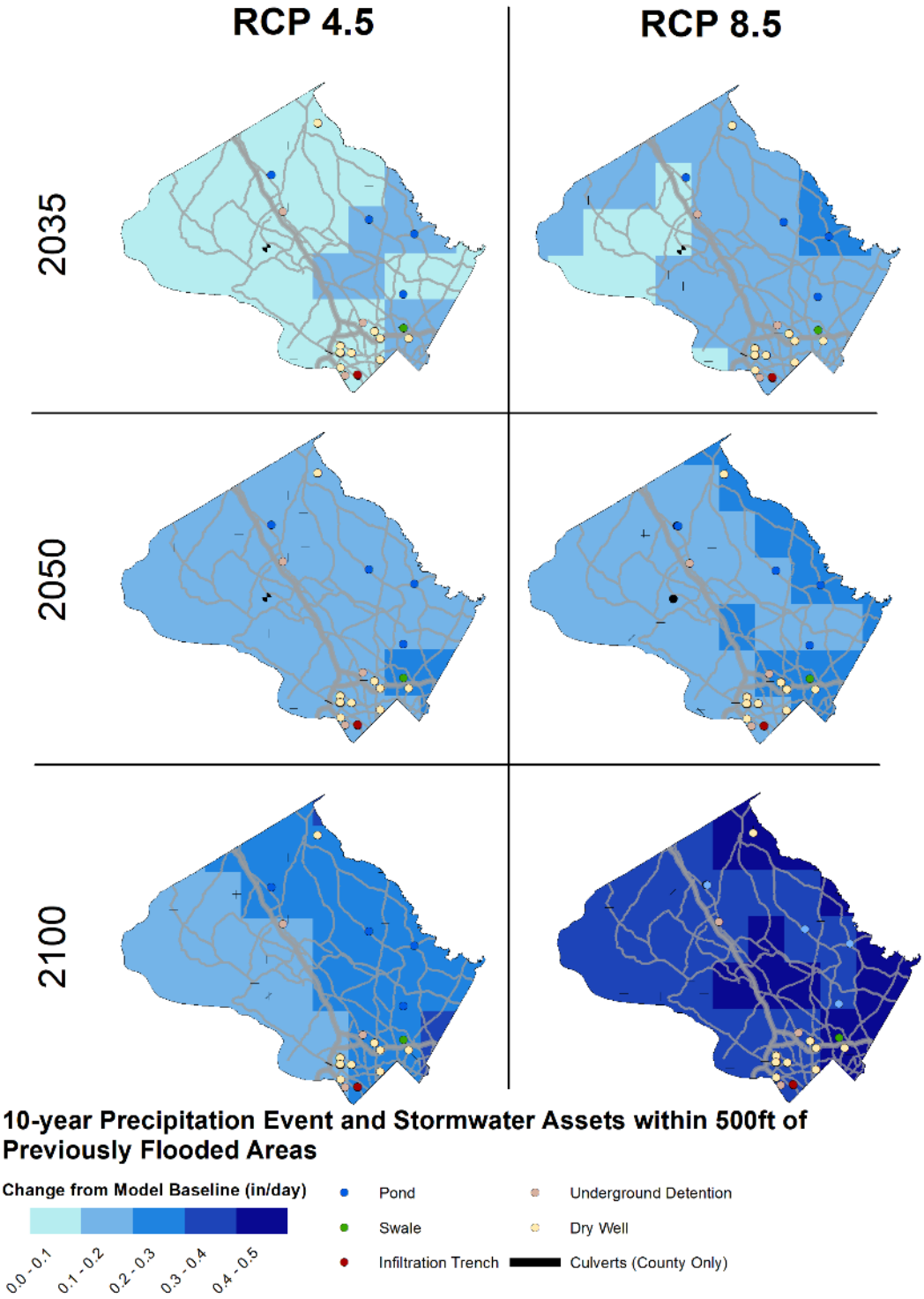

Figure 4-13. Change over the baseline for the 10-year rainfall event for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for stormwater management assets within 500 feet of NWS flood reports and MDOT frequently flooded roads

4.5 Agricultural Resources

Hazard Exposure

The agricultural reserve lands cover a large portion of the County to the west and north. This asset category is likely to experience impacts of extreme precipitation, extreme heat, drought, and high winds, making this one of the most vulnerable asset categories. The hazard exposure is shown in Figure 4-14 (100-year precipitation), Figure 4-15 (risk of severe drought months per year), and Figure 4-16 (number of days above 95°F per year). Along with increased exposure to extreme events, agricultural resources may stand to benefit to some extent from an increased growing season as the winter-spring transition shifts.[15]

Sensitivity

Crops can vary in sensitivity to various climate hazards, but for the purposes of this analysis, this asset category is considered sensitive to temperatures, drought, intense rainfall, and even high winds.

Adaptive Capacity

During times of drought, additional water will be needed, and if that is available, crop production can continue. Temperatures outside the normal range (high or low) are detrimental to crops and are difficult to mitigate in large areas where providing temperature-controlled shelters such as greenhouses requires significant investment. Famers may be able to change crops in the future to those better suited for a changing climate, but for one season with extreme temperatures, there is not very much adaptive capacity.

Extreme precipitation can be effectively managed by improving soil texture and organic carbon content, which dramatically increases the infiltration capacity of soil.[16] Regenerative agricultural practices help maintain soil structure and infiltration capacity.

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15 Dupigny-Giroux, L.A., E.L. Mecray, M.D. Lemcke-Stampone, G.A. Hodgkins, E.E. Lentz, K.E. Mills, E.D. Lane, R. Miller, D.Y. Hollinger, W.D. Solecki, G.A. Wellenius, P.E. Sheffield, A.B. MacDonald, and C. Caldwell, 2018: Northeast. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 669–742. doi: 10.7930/NCA4.2018.CH18.

16 Rattan, L. 2016. "Soil health and carbon management." Food and Energy Security 5(4). P. 2048-3694.

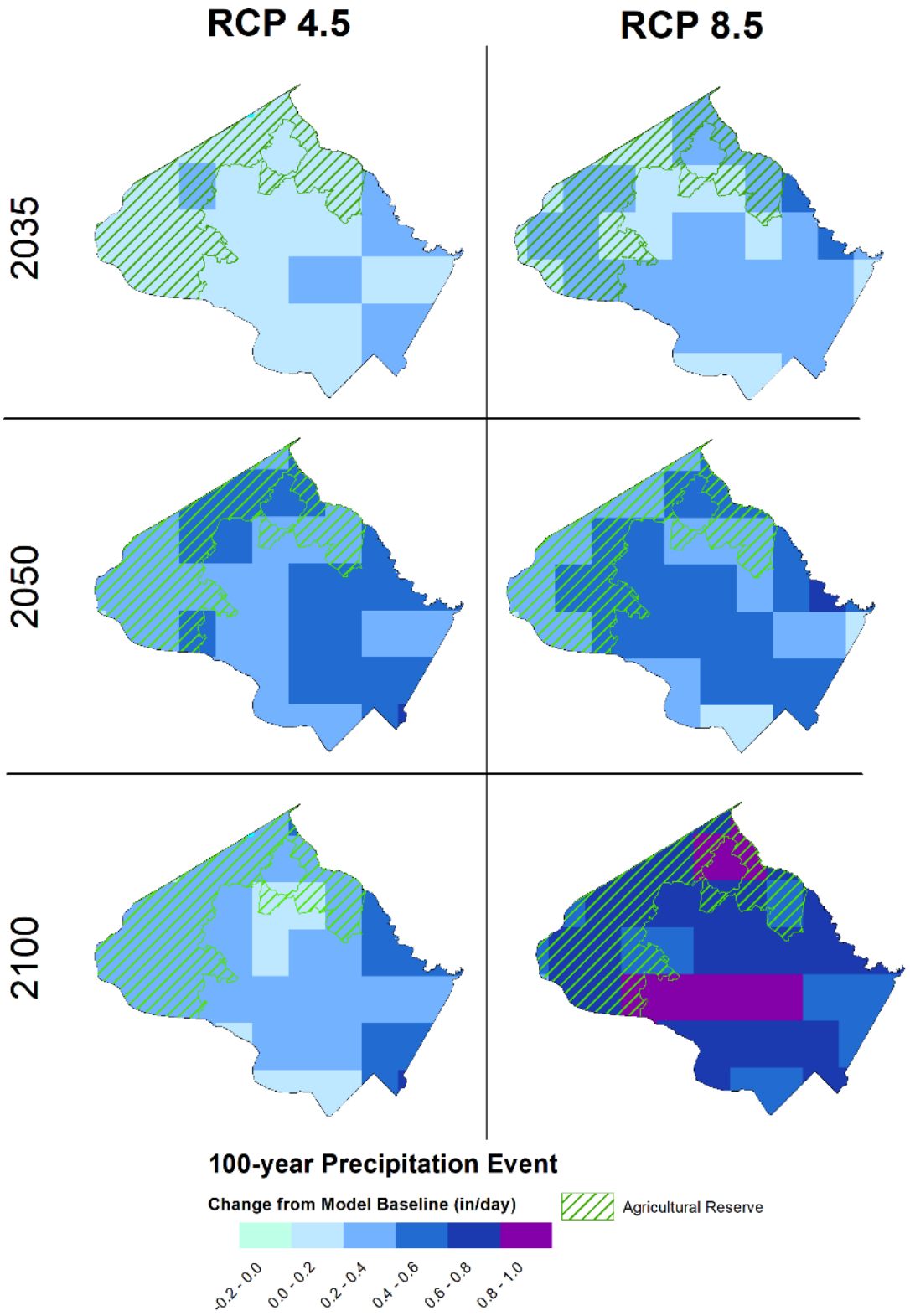

Figure 4-14. Change over the baseline for the 100-year rainfall event for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for agricultural reserve

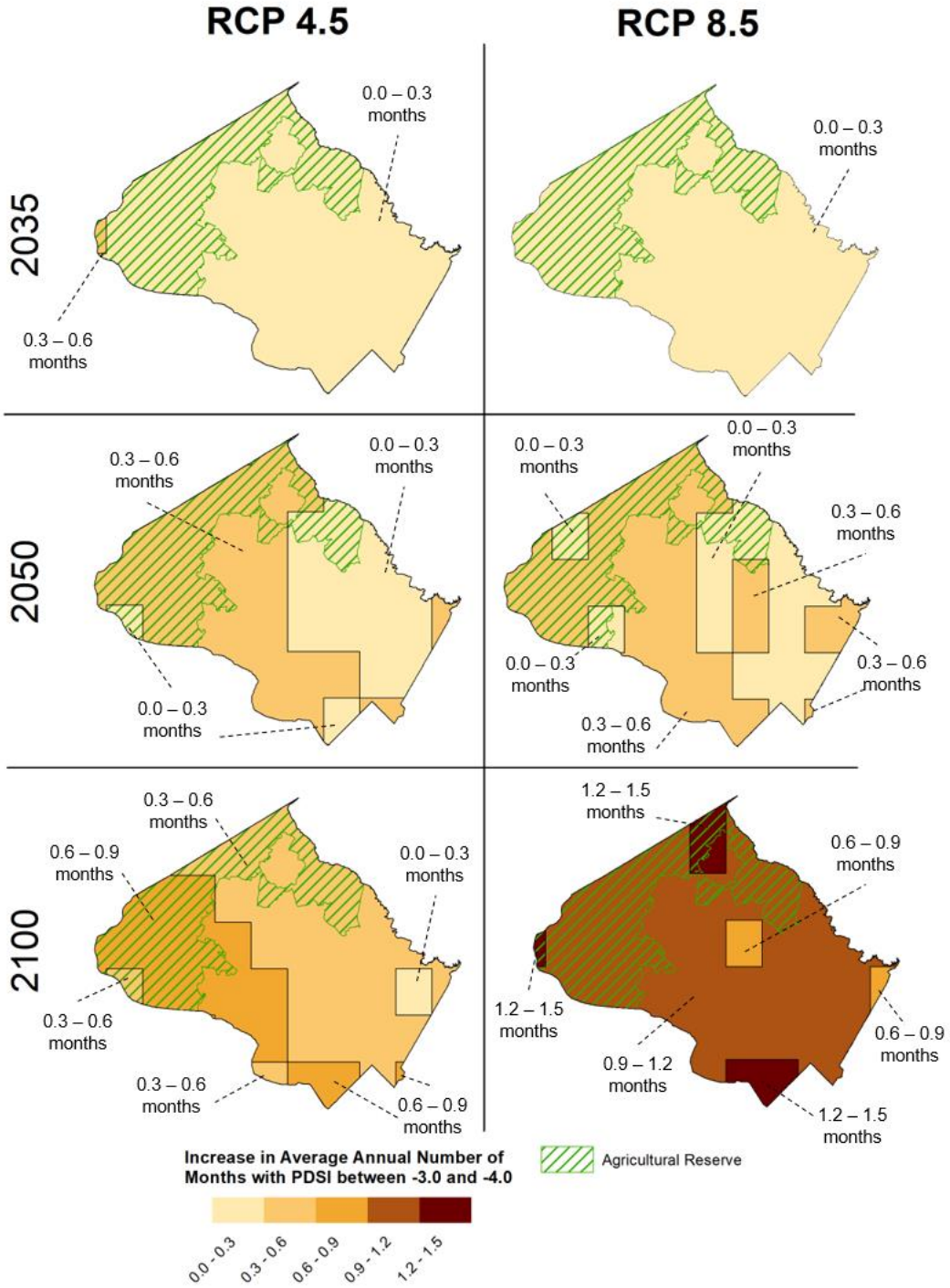

Figure 4-15. Changes to average number of severe drought (PDSI between -3.0 and -4.0) months per year for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for agricultural reserve

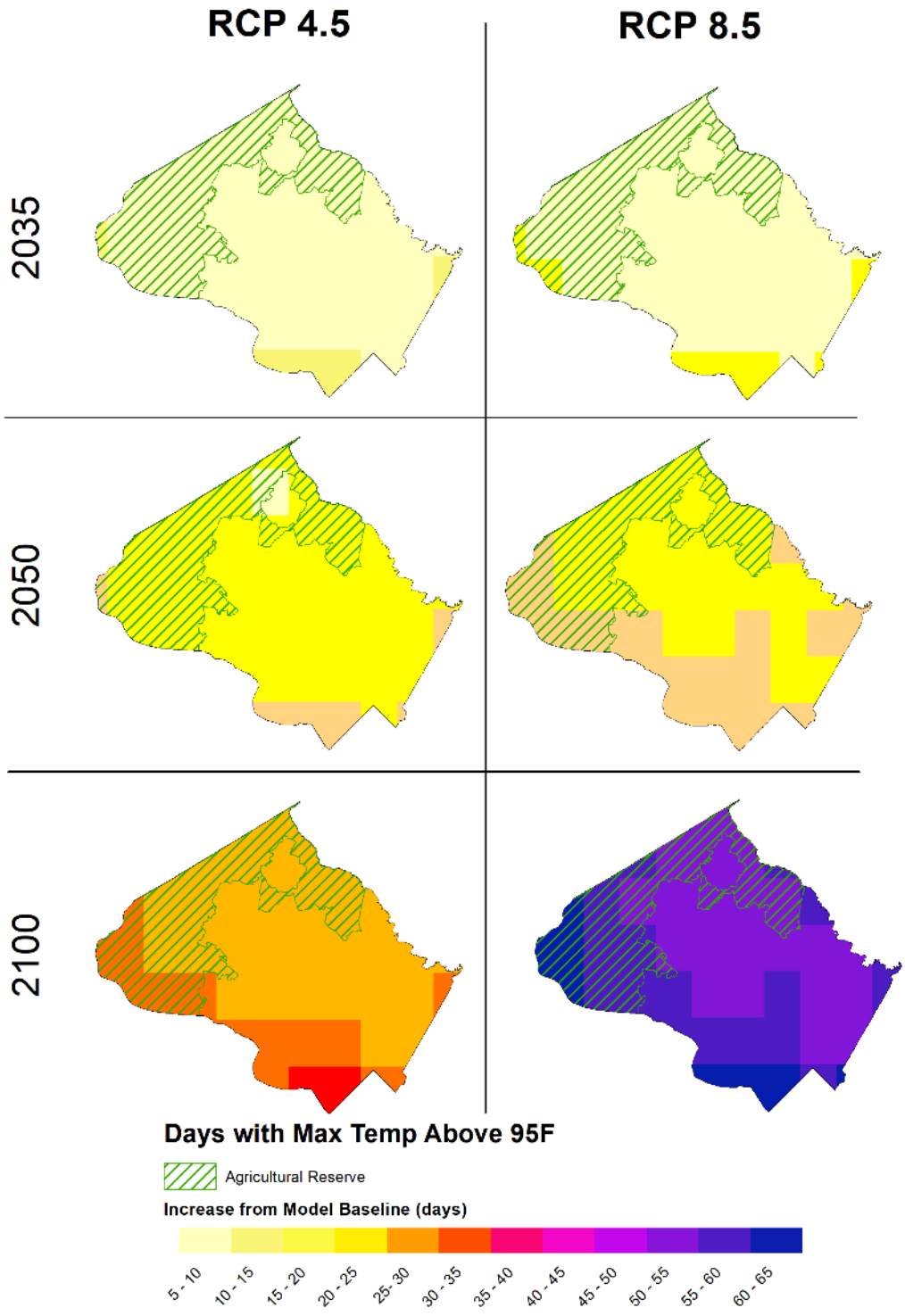

Figure 4-16. Increase in the number of days >95°F per year for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for agricultural reserve

4.6 Parks, Wetlands, and Trees

Hazard Exposure

Parks, wetlands, and trees are a valuable part of Montgomery County's ecosystem. Trees provide shade and help keep ambient and building temperatures lower during times of high heat. Drought, high heat, extreme precipitation, and high winds can all impact the built and natural systems in the parks and other preserved lands. Figure 4-17 and Figure 4-18 show future hazard exposure to the 100-year precipitation event and the number of days greater than 95°F, respectively, for park and wetland layers.

Tree locations are a cross-over asset category encompassing homes, critical and County resources, the agricultural reserve, and parks. They are included in this asset category for ease of categorization of actions in Section 5.0 of this report. Figure 4-19 shows how the temperature increases compared to areas of existing tree cover throughout the County.

Sensitivity

A changing climate can alter the natural habitat of both plants and animals that make their homes in parks and wetlands. Public parks in more urban areas are not considered particularly sensitive to natural hazards because they are typically home to more robust plant and animal species. Wetlands, however, may be much more sensitive to changes in water patterns, salinity, temperature, and drought. Trees can be damaged in high winds, but they are generally suited for the current rain and temperature climate; however, they may become more sensitive to invasive species and diseases as the climate changes. Public access to parks may be restricted or suspended if trails and other park facilities are affected by flooding, extreme heat, or extreme winds.

Adaptive Capacity

Within the parks and wetlands areas, adaptation is possible as long as there is space. If increased precipitation changes lake levels, boat launches may need to be moved or beaches may be inundated. This will change the experience of the park, but should not significantly diminish County residents' ability to interact with these places. Wetlands may have less adaptive capacity if they are unable to encroach on higher elevations with the changing climate due to surrounding land use limitations. Replacing lost trees with new trees can take a long time, so trees are not considered to have high adaptive capacity.

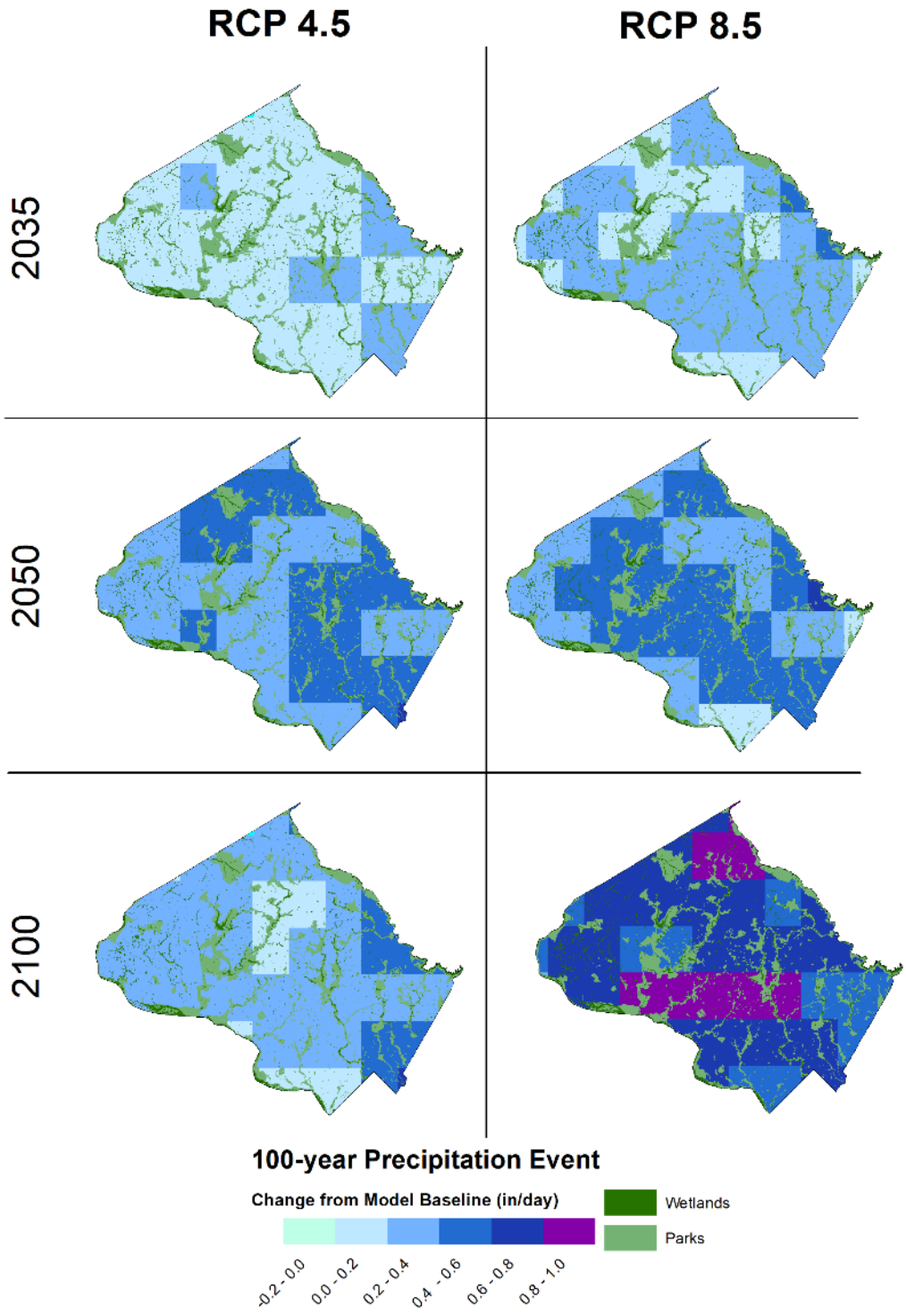

Figure 4-17. Change over the baseline for the 100-year rainfall event for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for park and wetland areas

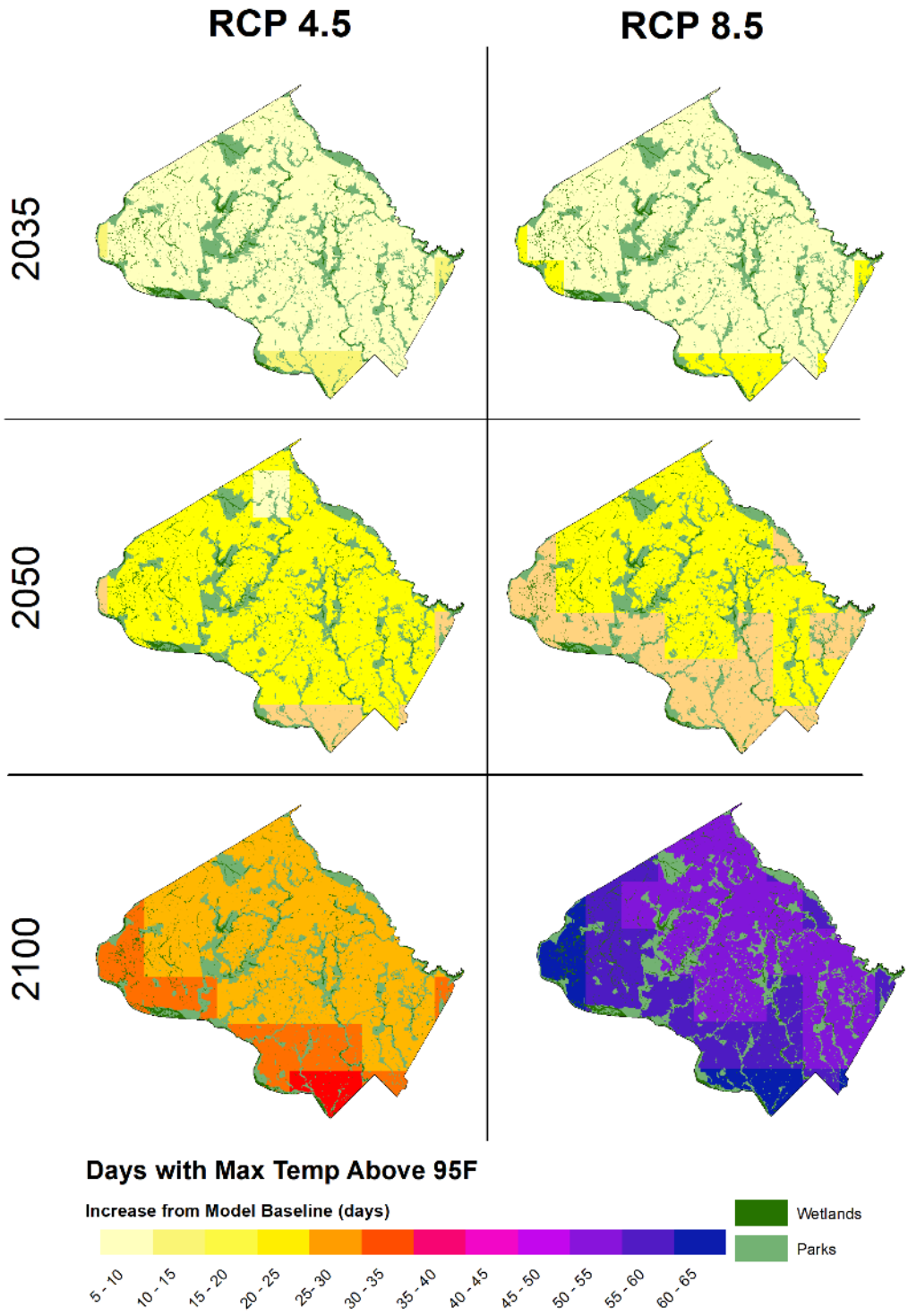

Figure 4-18. Increase in the number of days >95°F per year for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for park and wetland areas

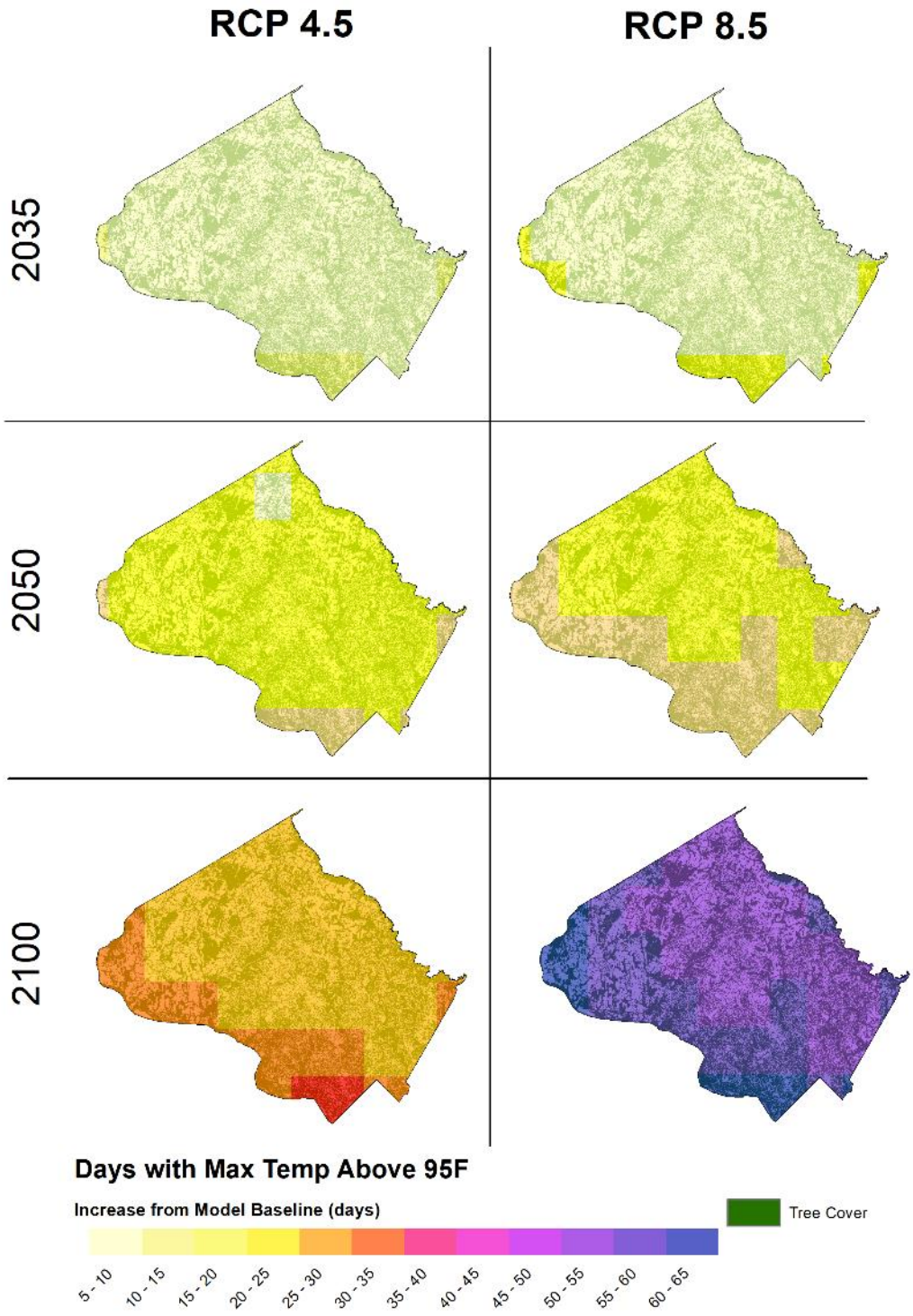

Figure 4-19. Increase in the number of days >95°F per year for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) for areas with tree cover

4.7 People and Homes

Hazard Exposure

Extreme Precipitation

A database of building footprints throughout the County was used to examine the flooding risk on homes, although this analysis includes businesses as well as the critical and County resources discussed in Section 4.2. The number of homes obtain from the database is shown in Table 4-5.

Table 4-5. Number of Homes in, within 250 feet, and within 500 feet of the FEMA Floodplain

Total Homes in Montgomery County	Homes in FEMA Floodplain	Percent of Total Homes	Homes within 250 feet of FEMA Floodplain	Percent of Total Homes	Homes within 500 feet of FEMA Floodplain	Percent of Total Homes
404,057	3,384	1%	17,761	4%	38,491	10%

Currently, 3,384 homes are located within the effective FEMA floodplain.[17] When looking at nearby buildings, this expands to over 17,000 homes located 250 feet or less from the floodplain and more than doubles to over 38,000 homes when looking just 500 feet from the floodplain (see Figure 4-20).

Additionally, overland flooding related to stormwater flooding during increased precipitation impacts people on the sidewalks and streets as well as homes.

Flooding disproportionately affects socially vulnerable groups, as they tend to be concentrated in dense metro areas and live in the lowest-lying areas within or adjacent to floodplains, in neighborhoods with little or no green spaces to capture stormwater, and in areas that have historically received less flood protection investment.

17 https://msc.fema.gov/portal/search

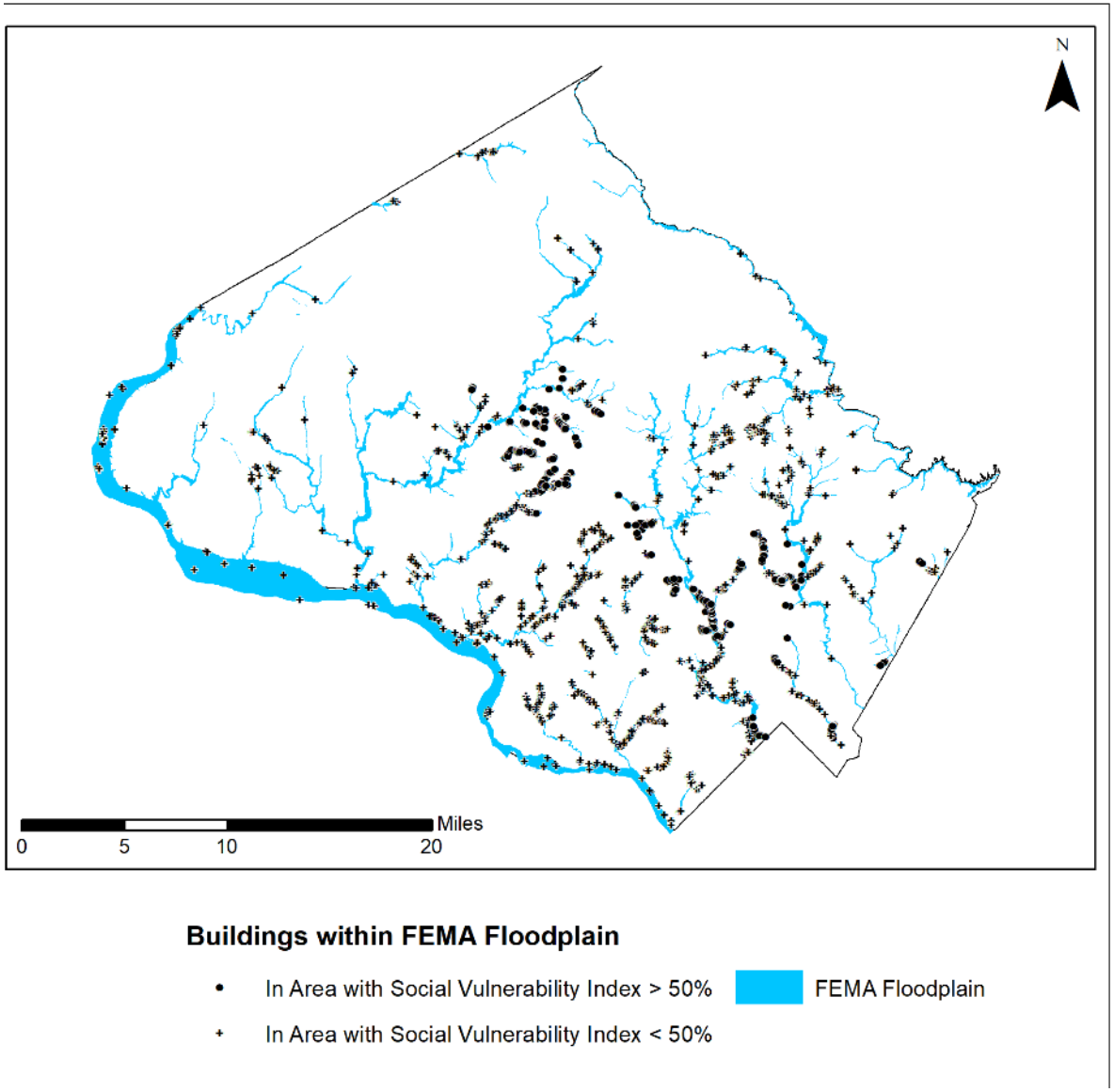

Figure 4-20. Buildings within 500 feet of the FEMA floodplain by SVI rating

Extreme Heat

Significant temperature increases are projected throughout Montgomery County, including hotter days (>95°F and >105°F) and an increase in the number of warm nights (>75° F). While increased temperatures will be experienced by people in all areas of the County, socially vulnerable populations will experience significantly greater exposure, as shown by the following list of causes:

- Homes that do not have air conditioning
- People who experience high energy burdens[18] and energy poverty[19]
- Higher-density residential areas with fewer trees and more impermeable surfaces
- Reduced property size and increased number of occupants
- Automobiles with limited or no air conditioning
- Reliance on high-exposure modes of transportation such as biking, walking, and public transit
- High-exposure occupations (e.g., construction, landscaping, etc.)

Projected increases to average temperatures and heat waves can be exacerbated by a phenomenon commonly referred to as the urban heat island effect. Urban heat islands can be defined as developed urban areas that experience consistently higher temperatures than surrounding areas with lower population density and more pervious ground cover (unpaved area that allows water to flow through) and vegetation. The urban heat island effect is the result of multiple factors often associated with urbanization, such as a concentration of construction materials that absorb and store more heat than the natural environment and then re-emit that heat when temperatures would normally decrease, minimal or no evapotranspiration (transfer of water from land to the atmosphere) due to lack of exposed soil and vegetation, concentrated heat generation from air conditioning and vehicle exhaust, and diminished wind flow due to building placement and concentration. The urban heat island effect was not directly quantified as a part of the climate vulnerability assessment, but it would likely increase extreme temperature experienced in urban parts of the County. Figure 4-21 and Figure 4-22 show the areas of the County with impervious surfaces (paved roads or surfaces that do not allow water to pass through) and tree coverage, outlining sections of the County with a CDC SVI of 50% or greater. The map highlights that many of the areas of the County with the most vulnerable communities also have high concentrations of impervious surfaces, which contributes to the urban heat island effect and increased temperature.

High Winds

High winds may have a limited impact directly on buildings through wind damage, but loss of electricity is more hazardous to human health, especially in times with increased heat.

Drought

Drought impacts people when water restrictions are put into place. Droughts are projected to increase in frequency and severity.

Sensitivity

People and homes are very sensitive to the impacts from these natural hazards. People will experience the changing climate as they commute and recreate. Flooding can damage or destroy homes as well as lead to the development of mold infestations, which can cause or exacerbate respiratory conditions. Increasing flood frequencies may result in higher insurance premiums, and homeowners who may not have been required to purchase flood insurance may find themselves within newly expanded floodplains. Communities will have to deal with the impacts of drought when

18 Note: High energy burden is defined as energy bills exceeding 6% of the household income, annually.
19 Note: Energy poverty is defined as energy bills exceeding 10% of the household income, annually.

water supplies are limited. Air conditioning will become even more important as future temperatures rise, and the costs associated with operating and maintaining these systems will rise accordingly. High winds can result in loss of electricity and flooding impacts on both people and homes. High winds can also prove extremely dangerous to pedestrians, drivers, and cyclists who may be impacted by flying debris and falling trees or who may simply lose control and cause serious accidents.

As reported in the 2016 *Maryland Climate and Health Profile Report*, extreme heat events can increase heart attack risk, particularly among non-Hispanic Blacks aged 65 or older.[20] Extreme heat and precipitation have also been associated with increased risk of hospitalization for asthma in Maryland.[21]

Socially vulnerable populations are significantly more sensitive to hazard exposure, as they often suffer from chronic health conditions and have limited access to medical treatment and support. Additionally, poorly maintained or inadequate infrastructure in socially vulnerable neighborhoods can focus impacts of exposure to areas where they will do the most significant damage. Figure 4-23 highlights how the increases in temperature will coincide with areas of social vulnerability.

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20 Maryland Climate and Health Profile Report (2016). Available: https://mde.maryland.gov/programs/Marylander/Documents/MCCC/Publications/Reports/MarylandClimateandHealthProfileReport.pdf

21 Soneja, Sutyajeet, et al. "Exposure to extreme heat and precipitation events associated with increased risk of hospitalization for asthma in Maryland, USA." Environmental Health 15.1 (2016): 57. Available: https://phpa.health.maryland.gov/OEHFP/EH/Climate%20Change%20Binder/Soneja%20EH2016.pdf

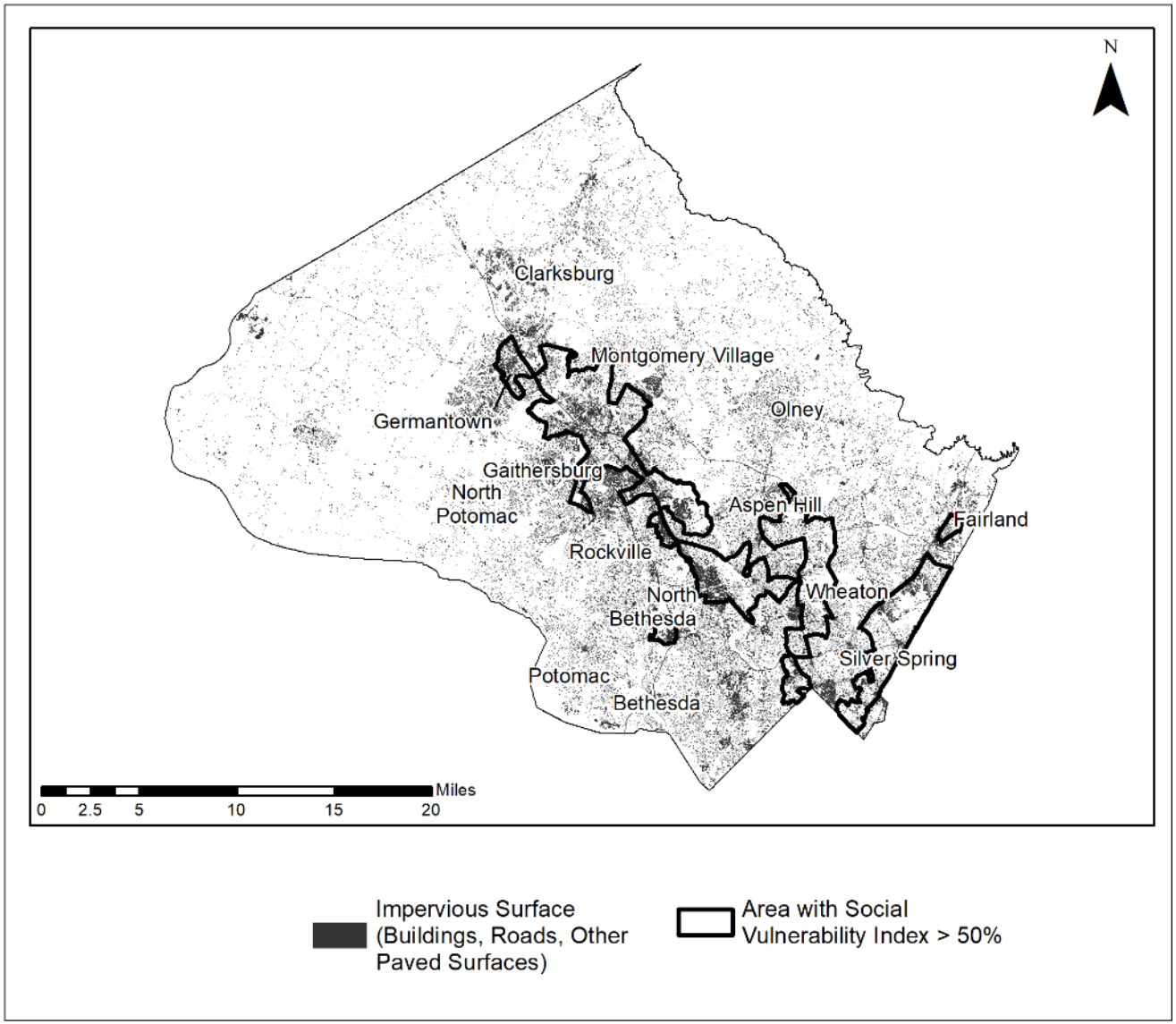

Figure 4-21. Impervious surface in Montgomery County, outlining areas ranked in the top 50% most vulnerable by the CDC SVI

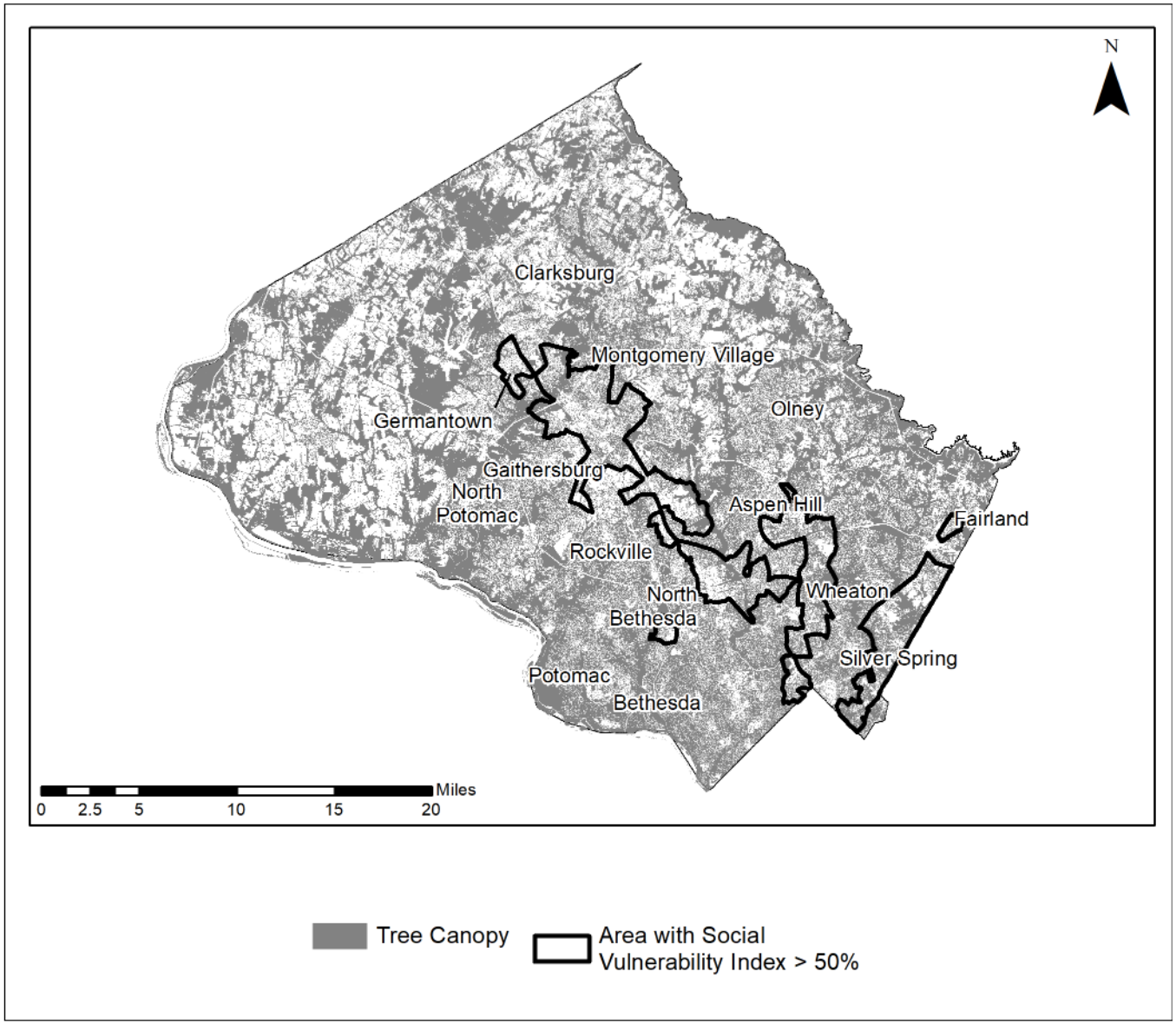

Figure 4-22. Tree canopy in Montgomery County, outlining areas ranked in the top 50% most vulnerable by the CDC SVI

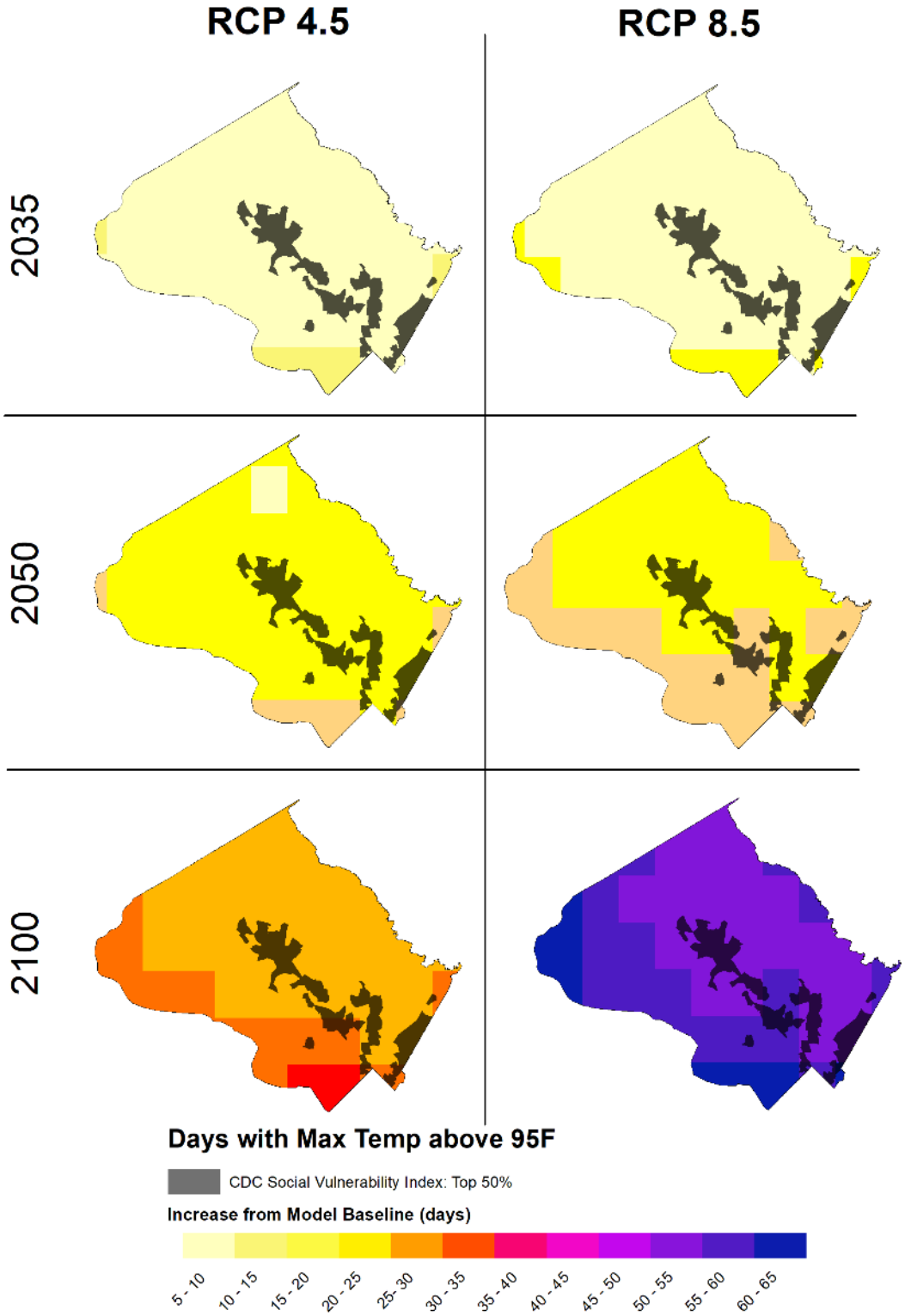

Figure 4-23. Increase in the number of days >95°F per year for three future years (2035, 2050, and 2100) and two climate scenarios (RCP4.5 and RCP8.5) compared to areas with higher social vulnerability

Adaptive Capacity

As seen during the COVID-19 pandemic, people are highly adaptable and will continue to be so as the climate changes. Adaptive capacity, however, is related to not just the human spirit, but also the resources available, such as more disposable income to make adjustments to housing. Language barriers could prevent homeowners from finding out about County incentive programs that provide support for resilience measures. The key to understanding adaptive capacity for people and homes is understanding the environmental justice barriers that might prevent equitable adaptive solutions for all County residents. Options like working remotely from home and limiting outdoor activity during a heat wave, extreme precipitation, or high wind event may not be available.

4.8 Results Summary

For each asset category, the general exposure, sensitivity, and adaptive capacity were ranked based on the perceived risk. This data is displayed in Figure 4-24. Red signifies more vulnerability, orange indicates some vulnerability, and gray indicates low vulnerability. However, when looking at the exposure and sensitivity categories, red indicates high exposure and high sensitivity, but when looking at adaptive capacity, it is low adaptive capacity (not high) that results in a red ranking.

Assets	Exposure				Sensitivity				Adaptive Capacity			
	Precipitation	Temperature	Drought	High Winds	Precipitation	Temperature	Drought	High Winds	Precipitation	Temperature	Drought	High Winds
Transportation	H	H	L	S	S	S	L	S	S	S	L	S
Critical and Community Resources	S	S	S	S	S	L	S	L	S	S	L	L
Utilities	S	H	H	H	S	H	S	H	L	L	S	S
Stormwater Management	H	L	L	L	H	L	L	L	S	L	L	L
Agricultural Reserve	S	H	H	S	S	H	H	S	S	S	S	S
Parks and Wetlands	S	H	H	S	L	S	S	L	S	S	S	S
People and Homes	H	H	H	S	H	H	H	S	S	S	S	S

H High vulnerability

S Some vulnerability

L Low vulnerability

Figure 4-24. Vulnerability ranking by asset category and hazard category

5.0 Conclusions and Next Steps

The most significant changes observed in the future conditions climate assessment appear to be related to extreme heat. Extreme heat poses great risks to human health as well as the natural environment, where agriculture and local plants and wildlife will struggle to adapt. Along with extreme heat, moderate to extreme drought is also expected to increase by the end of the century, impacting agriculture, water resources, and human health and well-being. Extreme precipitation is projected to show more modest increases, with the most frequent events showing little to no change. Though the higher-frequency events show little change, it is likely that flash flood risk will increase in sub-daily precipitation events. The most extreme precipitation events also show the largest increases in intensity, resulting in more widespread and severe impacts when they do occur. Moreover, vulnerable populations, as identified in this report using the CDC SVI (2016), will face greater impacts due to limited resources and access to adaptation and mitigation options.

Looking at the exposure, sensitivity, and adaptive capacity of the asset categories found throughout Montgomery County, the highest risk asset categories and hazard combinations are:

- **Transportation:** Precipitation and Temperature
- **Utilities:** Temperature, Drought, and High Winds
- **Stormwater Management:** Precipitation
- **Agriculture:** Temperature and Drought
- **People and Homes:** Precipitation, Temperature, and Drought

Although there is still some risk from other hazards beyond the major hazards for the asset categories listed above, this risk is more limited. Additionally, there are lower risks for the asset categories Critical and County Resources and Parks, Wetlands, and Trees.

While this assessment takes the first steps in identifying vulnerable assets and communities within Montgomery County, further work is needed to adequately prioritize assets and select appropriate, site-specific adaptation strategies to reduce climate hazard risk. Many important assets such as natural gas lines, homeless shelters, transportation maintenance and operations facilities, urgent care facilities, and childcare facilities, to name a few, were not included in this assessment and should be considered in future discussions. Community and stakeholder coordination will be critical to ground-truth the needs and vulnerabilities of both assets and people. Complex systems such as transportation, power, water, and sewer will require a more focused consideration if limited resources are to be allocated and used effectively. Additionally, detailed hydraulic models should be used in conjunction with the projections of future extreme precipitation scenarios developed in this study to develop future conditions floodplains and prioritize stormwater system improvements.

This climate vulnerability assessment considers the potential risk and impacts of extreme heat, extreme precipitation, drought, and high winds. In the next phase of this study, the vulnerability assessment will be used to rank and prioritize climate actions and to develop equity-enhancing measures for priority actions. This assessment will help the County in identifying and preparing for the natural hazard vulnerabilities that exist now and will persist in the future.

Attachment A

Table A-1. Asset Data Sources

Asset	**Asset Category**	**Source Notes**	**Online Link*** (if applicable)
Bikeways	Transportation	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/bikeways
Ride On Bus Stops	Transportation	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/rideonbusroutes
Street Centerlines	Transportation	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/street-centerline
MARC Rail Stations	Transportation	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/marc
MARC Rail Lines	Transportation	Census TIGER	https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html
Metro Rail Lines and Stations	Transportation	National Capital Regional Transportation Planning Board	https://rtdc-mwcog.opendata.arcgis.com/datasets/0d90d7b18c644657ba7646149b72e2d1_1
Proposed Purple Line	Transportation	MCAtlas	https://mcatlas.org/tiles/00_Shapefiles/Purple%20Line.zip
Airports	Transportation	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/airport-pts
Schools	Critical and County Resources	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/schools-elementary
County Recreation Centers	Critical and County Resources	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/recreation-ctr
Libraries	Critical and County Resources	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/library
Health and Human Services Nursing Homes	Critical and County Resources	Montgomery County Department of Environmental Protection GIS Department	geocoded from the list here: https://data.montgomerycountymd.gov/Health-and-Human-Services/HHS-Nursing-Homes/7m4d-85ys/data
Hospitals	Critical and County Resources	Montgomery County Open Data GIS	https://www.arcgis.com/home/item.html?id=dfa6f313f07346b48e415181b9dc0116
Police Stations	Critical and County Resources	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/police-stations

Asset	Asset Category	Source Notes	Online Link* (if applicable)
Fire Stations	Critical and County Resources	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/fire-station-pts
Emergency Shelters	Critical and County Resources	Montgomery County Department of Environmental Protection GIS Department	
Multi-Agency Buildings	Critical and County Resources	Montgomery County Department of Environmental Protection GIS Department	
Drinking Water Reservoirs	Utilities	Maryland GIS Data Catalog	https://data.imap.maryland.gov/datasets/maryland-waterbodies-lakes-detailed
Wastewater Treatment Facilities	Utilities	Montgomery County Department of Environmental Protection GIS Department	
Pump Stations	Utilities	Montgomery County Department of Environmental Protection GIS Department	
Electrical Lines	Utilities	Montgomery County Department of Environmental Protection GIS Department	
Substations	Utilities	Montgomery County Department of Environmental Protection GIS Department	
Power Generation Stations	Utilities	Montgomery County Department of Environmental Protection GIS Department	
Dry/Wet Ponds	Stormwater Management System	Montgomery County Department of Environmental Protection GIS Department	
Swales and Bioswales	Stormwater Management System	Montgomery County Department of Environmental Protection GIS Department	
Infiltration Trenches	Stormwater Management System	Montgomery County Department of Environmental Protection GIS Department	

Asset	**Asset Category**	**Source Notes**	**Online Link*** (if applicable)
Undergrounds Detention Basins	Stormwater Management System	Montgomery County Department of Environmental Protection GIS Department	
Dry Wells	Stormwater Management System	Montgomery County Department of Environmental Protection GIS Department	
Culverts	Stormwater Management System	Montgomery County Department of Environmental Protection GIS Department	
Agricultural Reserve	Agricultural Reserve	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/agricultural-reserve?geometry=-78.959%2C38.770%2C-75.454%2C39.516
Parks	Parks, Wetlands, and Trees	Montgomery County Open Data GIS	https://data2018-mcgov-gis.opendata.arcgis.com/datasets/parks
Wetlands	Parks, Wetlands, and Trees	Maryland GIS Data Catalog	https://data.imap.maryland.gov/datasets/cd293a192f844ac49d9716ee5a107d7a_1
Tree Cover	Parks, Wetlands, and Trees	Maryland-National Capital Park and Planning Commission	

*Note: Online links accessed December 9, 2020

This space is reserved for local art work from winners of the County's art contest.

Calling all artists and climate justice activists!

Montgomery County is hosting a competition for artwork to be featured in the County's climate action plan. What photos, drawings, poems, digital art, and memes (yes, we meant it, memes) invoke the need to protect your community from climate change? Help us to harness your creativity to sound the alarm about the climate emergency. Art is an incredibly important tool that will engage all County residents from a variety of backgrounds. Through this contest, we hope to reach those who might not have previously been engaged in the climate planning process, especially those from marginalized backgrounds who will be disproportionately impacted by changes in climate. The deadline for the contest in Sunday, January 31, 2021. For more information, please visit ***the art contest website***.

Appendix D: Racial Equity and Social Justice Workshop Takeaways

RACIAL EQUITY AND SOCIAL JUSTICE WORKSHOP SUMMARY

MONTGOMERY COUNTY, MARYLAND
CLIMATE ACTION PLAN

09/14/2020

Table of Contents

Introduction

The County held a two-part Racial Equity and Social Justice Workshop via Zoom on September 8, 2020 and September 15, 2020 with more than twenty community organizations spanning public health, economic development, environmental justice, civil rights, and religious areas. Workshop participants represented organizations that work with and serve vulnerable communities in the County, and participants were asked the questions outlined below, which the County CAP team developed. The following is a summary of workshop participant responses by question. This broadened engagement enabled the County to begin to identify existing blind spots and barriers to implementation, incorporate diverse voices and perspectives into the development of the CAP, and start conversations with underrepresented communities that will continue through action development and implementation.

Question 1: How does climate change impact the communities that you serve?

Flooding

1. Flooding has several impacts on communities in Montgomery County. For faith-based institutions, flooding in parking lots can be costly to manage and precludes access to services that these institutions provide to the community. In addition, runoff can impact adjacent neighbors.
2. Flooding impacts mobility because it makes it more difficult for people to get to work and can create new physical barriers that also impact mental health.
    a. One work example is that many Muslim refugees work as rideshare or cab drivers and are unable to work when there are strong storms or flash floods in the area.
3. Many low-income and immigrant communities are likely to live in basement apartments and are severely impacted when flooding occurs. They experience mold as a result of flooding and don't have the resources to pay for professional services to deal with the flooding and mold.
    a. Many times, these are immigrants who are dealing with landlords that refuse to provide this assistance as well. Tenants often feel powerless and are left to deal with the real-life consequences that are created from flooding in their homes.
    b. Flooding also causes displacement and homelessness in the community, which in turn can threaten an individual's physical safety.

Utilities

1. High utility costs are exacerbated by high heat days. This becomes burdensome for people living in informal rental agreements such as undocumented immigrants. It also becomes a challenge for people who can't afford higher utility costs.
2. Communities lack access to alternative sources of power in the event of a storm outage. This can lead to fatal health outcomes for those who rely on electronic medical equipment.

Climate Change Health Impacts

1. Many people living in older homes do not have air conditioning and are more susceptible to extreme heat.
2. Climate change increases heat-related illnesses, such as dehydration and stroke for elderly populations, and negatively impacts people experiencing homelessness.
3. People who work outdoors in industries such as construction are more at risk for heat exhaustion and respiratory-related illnesses due to air quality.
4. Kids suffering from asthma seem to experience worse impacts than adults.
5. Air quality is a prevalent issue, and impacts are felt throughout the community.

Economic Uncertainty

1. As evidenced during COVID-19, service workers are hit especially hard by economic crises, as are taxi/Uber/Lyft drivers. These people usually support the local business economy by shopping in their neighborhoods. However, during extreme weather events and other crises, these communities are severely impacted.

Infrastructure

1. Climate change disproportionately impacts low-income and communities of color because of outdated and failing infrastructure in schools. Older heating and cooling systems are more likely to fail, which can lead to mold problems and extreme heat. This makes it harder for children to learn.

2. There are areas where a majority of the children live within walking distance to their schools, but dangerous traffic and poor infrastructure for pedestrians lead to them being bused.
3. Increasing the number of electric buses in the County's fleet would have positive health impacts for children who live in areas with heavy auto and bus traffic.
4. There needs to be better access to transportation choices in lower-income communities. Do people have the same access to transportation? People should be able to walk and bike safely, but first the infrastructure needs to be updated.
5. Persons of all ability levels should be able to move around safely. How safe do people with disabilities feel when walking and biking in our community?

Resource Availability

1. When you are impacted by disaster, you need adequate access to resources; however, many communities do not have the resources they need or know-how to access resources.
2. Some leaders expressed that people in their communities face fear of eviction as well as rental assistance need, childcare concerns, distance learning issues, and food insecurity.
3. In the resilience survey, people talked about the need to access resources, more education on what's available, and the need to access better education.
4. When COVID-19 started, many immigrant communities weren't aware that schools were providing food.
5. Some community members don't have a computer or, even if they have the equipment, don't understand the basics of navigating it to find resources.

Lack of Awareness of Climate Change Impacts

1. Many community members are not aware of the impacts of climate change (partly due to lack of education) or do not perceive it as a major concern. To bring the issue of climate change closer to community members, it is important to link it to an issue that is of high importance or concern (for example, health, income, household costs, and food security).
2. It is hard to concentrate or pay attention to climate change when you are in survival mode and just trying to get through day to day. People may be aware of climate change but have other pressing issues.

Additional Comments

1. Safety means different things to different people. Safety in one area means law enforcement. Safety and enforcement may mean something different in Bethesda versus Silver Spring.
2. The County needs to look from the outside in to really see the challenges that people have.
3. In working with recently arrived immigrants, many are coming from countries where violence and environmental issues such as drought are prevalent.

Question 2: Discuss the ability of the communities you work with to respond to the impacts of climate change.

Awareness

1. There is limited ability to respond to the impacts of climate change, which is largely due to lack of awareness, education, home ownership, and financial resources. One example that was provided was the ability to seek local grants to access financing for post-flood repair work. Many impacted households or organizations lack the capacity (time and ability) to develop and submit required grant proposals, which in turn limits them from accessing available funding.
2. Many communities don't know the resources that are free. It's an opportunity for the County to partner with other organizations to educate community members. For example, work with community newspapers and churches to get information out to the community.
3. Some immigrant communities don't understand how the government system in the United States works.
4. Language accessibility for all languages is important, and the government needs to be educated on the best languages to be used to respond and engage with community members. For example, information should come out on Spanish language radio and television.
5. Many children are living in multi-generation households (for example, three generations), so making kids aware of the issues could be helpful so they can pass on the information to other people in their households.
6. A lot of people don't know what the impacts of climate change are, and they feel distanced from the issue; for example, they do not have a sense of impending doom.
7. Raingardens
    a. Landlords didn't want to implement rain gardens because they were afraid of pests. The County needs to do a better job of educating landlords.
    b. Children can be introduced to sustainability practices such as rain gardens.
    c. Gardens are a great, multi-faceted jumping off point for food systems conversations, business, etc.
    d. The County should look at school property and work with farmers on implementing more rain gardens at these areas.
    Example: www.edibleschoolyards.org
8. Police and other emergency service workers may not be cognizant of the specific needs of individual groups in their responses to the community.

Vulnerability

1. It is hard for people who are financially vulnerable to respond and act to protect themselves. People are in response/reaction mode, not prevention mode—they may be able to pay to clean up from flood damage, but not able to pay for long-term fixes, like drainage systems, sump pumps, or even moving to a safer location, etc.
2. Many seniors have landlines and need someone to check on them after storms.
3. Many people in the community are from low-income households who own old, inefficient cars and who use 'dirty' heating oil in their homes. Additionally, many are renters and tend to live in older buildings and houses with old and outdated heating, ventilation, and air conditioning (HVAC) systems.
4. Seniors tend to be socially isolated. Many lack access to technology and may not know how to use smart phones to find more information. The mail carrier is usually the first to notice this social isolation.

5. Many undocumented people in Montgomery County lack medical insurance and therefore are not able to seek medical help or attention for issues, such as asthma or respiratory issues, that are worsening as a result of climate change. Many immigrant households also have a certain fear or apprehension associated with the medical system; they may not know how to navigate it appropriately or fear disclosing full information or symptoms, as it may result in consequences such as losing one's job.
6. There must be additional resources for underserved populations because they may not have the insurance or money for repairs.

Distrust of Government

1. Many new immigrants have a distrust of the government.
    a. People are coming from countries where the government is corrupt and oppressive and have a general distrust of government helping them.
    b. Some just got out of Immigration and Customs Enforcement (ICE) detention centers.
    c. They don't trust anyone that they don't know and in general are afraid to advocate for themselves.
    d. People will starve because they are afraid to tell anyone that they don't have food.
2. Black communities have experienced a history of systemic racism and injustice, which makes them less trustful of government.

Living Conditions

1. Many community members do not own the places in which they live. Renting makes it harder to respond to disasters because it creates dependency on the owner to do the right thing.
2. There is often a trade-off between costs and comfort/health, and many people who are out of work or earning less due to COVID-19 are trying to minimize costs as much as possible.
3. Many community members are also getting evicted and are increasingly living in crowded homes, which is exacerbating issues such as poor air quality, high heat, existing respiratory and cardiovascular issues, and other issues.
4. Seniors have 26+ villages that are supporting each other to remain in their homes.
5. Be conscious of communities that do not have access to social media or a phone.

Question 3: What barriers exist that prevent the populations you serve from participating in incentive or resource programs for new technology?

Financial Feasibility

1. Actions being put forward in the CAP need to be mindful of different people's ability to afford certain upgrades or changes as well as their ability to benefit from the proposed actions. Many households already have financial difficulties and should not be required to carry further financial burdens as a result of the CAP actions.
2. Affordability of new technologies is a huge barrier for some people, especially if it's something they have to pay for upfront.
3. There are options for renting/owning/leasing solar panels. The state program called BeSMART offers an annual percentage rate (APR) of 4.9%; however, applicants need a good credit score, and for many low-income households it is difficult to qualify. They have a $30k loan limit.

Awareness and Education

1. Innovation can be scary for people who don't trust people that they don't know. People are more likely to trust information from people they know within their own community than local government. The County needs to get the message across more effectively by using trusted people within the community.
    a. In some communities, women are often at home during the day and are less likely to know how to access reliable information on innovative programs.
2. Some people are unaware of the impacts of climate change and technologies that exist to mitigate those impacts; information should be prepared in a way that people can receive it.
3. Provide information about new adaptive technologies at existing events, for example, school or community-based programming (also consider using Montgomery County Council of Parent Teacher Associations (MCCPTA) Delegate Assembly for dissemination).

Lack of Home Ownership

1. Many community members are renters, and therefore the ability to make necessary upgrades to the home or unit is typically up to the landlord. In many renters' experience, they have found that landlords lack the incentives to invest in new, adaptive technologies such as solar panels or water pumps.

Language

1. With immigrant communities, language is often a barrier to accessing information and to increasing awareness.
2. An obstacle is that people may be from a Spanish-speaking country but speak an indigenous language; thus, even if information is translated into Spanish there are still literacy issues.

Technology

1. Some people may have an inability to maintain these technologies after installation, so they would rather not participate.
2. There can be a sense that some technologies, such as solar panels, are not attractive.

Additional Comments

1. People have a lot on their plates, so climate action can be difficult to prioritize in the midst of everything else.
2. Churches can be good spaces for community gardens, and there are examples of this in Baltimore. At George Washington University, produce from the community garden goes to Miriam's Kitchen. These are models to look at for innovation.

Question 4: What does racial equity and social justice mean to you when you think about climate action and resilience for the communities you serve?

Defining Racial Equity and Social Justice

1. Climate change doesn't have even implications across the planet.
2. Poor communities are typically located in areas where industries are also located, which tends to overburden these communities with pollution. Affluent communities don't have to deal with this issue, either because there are no industries in the vicinity or they have resources to put up more legal challenges.
3. As areas become gentrified and the price of rent, food, and other items increases, it will put a further burden on low-income households that already face poverty, for example, within the Black community.
4. It is also difficult as an immigrant—you're starting from zero, with no wealth and no connections, adjusting to a new language. It is hard to adjust, and many are just surviving. Immigrants also face mental health issues, which makes those barriers even harder to overcome. It is important to overcome the awareness about yourself, that my voice is not heard, for example, who's going to listen to a maid? It's often hard to understand that there's something bigger.
5. There is a strong correlation between mental health, green space, climate change, access to safe parks, and even COVID-19—do these spaces feel inclusive for all communities to enjoy?
6. The squeaky wheel gets the grease (resources are given to communities who make the most noise).
    a. Maybe people don't have access.
    b. People are working two or three jobs.
7. Respecting the agriculture reserve, but:
    a. Building density is high inside the Beltway in Montgomery County.
    b. Using the greenspace argument that is against development that will help working people or older people.

Messaging

1. The climate conversation should be contextualized within the larger environmental and racism frameworks.
2. Campaigns and incentives need to build on people's cultural practices, for example growing food at home/in their gardens.

Actions

1. The County should map different climate impacts and illustrate how climate change impacts communities across the County.
2. Racial equity and social justice should be an integral part of climate planning and should be the overarching framework for the CAP.
3. More resources should be set aside for underserved populations because they may not have insurance or money for repairs.
4. The County should look at a holistic approach because currently resources aren't being put into the communities that need it.
    a. We want to get people working and out of poverty.
    b. The good jobs are out of the area.
    c. Make sure communities have access to resources.

Awareness of Issues

1. People want to move where there are less climate impacts, but mobility is costly and is contingent upon being welcomed and included in a new area. Additionally, real conversations are required as well as providing solutions to people for moving out.
2. Given the very internationally diverse nature of the County's population, we should keep in mind the impact of migration because of climate change. We could have more people move to Montgomery County as climate refugees to join family members who are already here. And we should acknowledge the important role of indigenous people around the world as providing a last stand against environmental degradation in their communities, helping to protect everyone.
3. Many Montgomery County residents have roots and links with other countries that could be severely affected by climate change. The County could see migratory waves as a result.

Engagement

1. Participants emphasized the importance of using community ambassadors to increase the chances of adoption and inclusion of best practices. They also emphasized viewing their communities not as recipients of services or knowledge, but owners, valuing their contributions as well. This is especially important given that so many immigrants, for example, are creators and producers.
2. Caribbean population example: reach residents through Caribbean stores, markets, and churches. Residents of Caribbean descent mainly live in the Upper County and East County. The community ambassador can leave flyers at the store because they already have a relationship with the store owner and can talk to them about the subject. There is a Caribbean heritage of growing/sharing your own fruits and vegetables in the summer. This is also an opportunity for teaching.
3. In addressing climate change practices, we should be open to other ways of conserving; in other words, instead of marketing this as advice to give them, we need to approach their communities and learn about what they are already doing well. For example, many immigrants already grow their own food in gardens, reuse containers, cook from dried beans instead of buying in cans, etc. There is much to learn from them as well.
4. Kids are leading the charge on action toward tackling climate change. Outreach to them will reach their families as well.
5. Promoters of new ideas need to come from within the communities to develop trust.

Question 5: How can the County better engage with the communities you work with on the topic of climate change? How do they best receive information and provide feedback?

Relationship with Local Government

1. There is a lack of trust that underserved communities have with local governments, and that is a major driver for why certain communities do not engage with government.
    a. How can Montgomery County do a better job reaching out?
    b. Many times, people in these communities don't know how to reach out even if they want to.

Community Issues and Popular Misconceptions

1. There is a stereotype that Asians are doing very well economically; but, 12% of Asians in Montgomery County live below the poverty line.
    a. They exist as a silent minority—87% of Asians in Montgomery County are foreign-born.
    b. Many seniors in this community are housebound because they can't navigate language barriers to access help.
    c. Some Asians come as refugees from oppressive governments and are reluctant to reach out and engage with local government.
2. Different cultures exist even within communities. As an example, middle class Blacks and poor Black people reach out to different people when they need assistance. Someone who is middle class is less likely to use social services or have a social worker, so reaching them may take a different tactic.
3. Immigrant populations see things differently than those who are native-born, even when having the same ethnic background.
4. People of color are not a monolith, so remove existing stereotypes and stigmas when approaching communities.

Approaching Communities

1. The County should go into communities with an intent to listen.
    a. Some communities are aware of climate change and want to be heard.
    b. Bringing swag (giveaway materials) and passing out information isn't enough.
2. Frame issues in a way that is understandable to the community. Instead of just talking about health impacts such as asthma and allergies or spaces near pollution-emitting sources, make the connections to climate change. Tell how it is linked.
    a. Be ready to provide solutions. What can the community do about it?
    b. What resources are currently available? Connect people to the resources.
    c. Don't just pile onto an existing load of issues that communities already have without offering solutions.
3. It's important to work with community leaders who have access and influence in the community instead of "assigned" leaders.
    a. Build the plan with people who are a part of the community.
    b. Understand the community.
4. The County has to understand what help-seeking behavior looks like and those things that would be most helpful to the community.
5. Meet people where they are. The information should be understandable for the intended audience.
6. Promote cultural competency and humility within the County staff.

    a. For example, don't go into communities as if you are there to save them.
7. Make sure information is disseminated in the language the community prefers.
    a. Example: Buy ad space in newspapers that are oriented to that community.
8. Does the County get community feedback before developing a plan? Sometimes the County comes up with a plan, but the community needed something else. Engagement should go beyond government agencies.
9. Develop linkages to lessons from schools. Those without kids depend on community organizations to stay aware of issues, so make use of mouth-to-mouth, on-the-ground community outreach.

Possible Solutions

1. Community health workers are vital and should be a part of the team. This is a short- and long-term solution for building relationships with the community.
2. Contact the Office of Community Partnerships to use existing agencies within the County that already do this work. This team also has translation capabilities.
3. Diversify County staff by having competent people in positions that reflect the diversity of the County. Although having diversity doesn't completely solve the issue, the County has to figure out how we live together with a finite pie.
    a. How will the County prioritize who is getting what out of the pie?
    b. How do you make leadership and engagement representation reflect the diverse mosaic world that we are?
    c. How do we exploit the diversity?
        i. The environment is a resource that is finite. Not everyone has equal access, and what people in the County hasn't figured out how to do well is live together. For example, how do we have different responses to COVID-19 within the same pie?
4. Policies and penalties also work. The government entity speaks to the common good. Do we have the diversity in the ranks to enact policies? Instead of waiting on the community, there are some policies that should be enacted because they are necessary.

Methods for Engagement

1. Reach out through faith-based communities and be sure to do so in many languages. It's important to speak persuasively to the benefits of the programs and changes the County is proposing. Definitely explore using community ambassadors in outreach efforts.
2. One lesson from COVID-19 is that Zoom and other internet-based meetings are easier for participants to attend.
    a. Example: A recent PTA meeting had over 150 people attend, which was the largest group in memory.
    b. Use existing platforms to reach out and make it easier to meet people where they are.
3. Group participants emphasized that messages spread by word of mouth are a very effective way to share information among community members. In addition, using established connections and local network builders is a good way to continue building relationships locally. Also, look at local business schemes, such as established cooperatives in the County.
4. While having the established climate ambassador program is a good start to serve as a bridge between the County and communities, more formal paid positions are preferred.
5. Continue to use multilingual outreach.
6. Focus on high school kids because they are interested in taking action against climate change.

7. Approach locally trusted media, for example radio stations.
8. Focus groups have been a success, especially events at where families can participate, with childcare and other incentives that are proven to work.
9. There are WhatsApp groups that are language-based, and the County Council has a Facebook page in Spanish that gets a lot of engagement.

Additional Commentary

What blind spots do you all see in the County's approach and the aggressive goals of 80% reduction of greenhouse gases by 2027 and no net emissions by 2035?

1. Great goals to accomplish, but it takes money to make things happen.
2. There isn't enough public transit.
3. Plans lack imagination and big ideas:
    a. For example, what if 50% of the pavement were removed?
    b. Provide incentives for e-bikes and e-scooters.
    c. Current plans are based on older or outdated websites.
    d. Build infrastructure that supports multimodal transportation such as:
        i. Benches
        ii. Lighting
        iii. Shade
        iv. Bike parking for cargo bikes
4. We think of our roads as they exist versus how they can be used in the future. As an example, what if scooter companies showed e-bikes and e-scooters in narrow bike lanes.
5. COVID-19 shows that people can change. There are people walking and biking; now imagine if they felt safe to do this regularly.
6. Trauma is an issue.
    a. People bring the trauma of the situations they left behind.
    b. Black communities are dealing with over-policing.
    c. Mental health is key in all of this.
7. Diversity in the County is not just Black and Brown. There is also an indigenous population.
    a. For example, there are Guatemalans in the County that are 100% indigenous.
8. The police don't have the capacity or are not interested in certain communities. For example, parks filled with bottles of liquor. There are no initiatives to have safe parks, safe places, safe illumination. Getting the police involved could help.
9. Public spaces will continue to be full of trash if you don't invest in them. If local government is not investing in us, why should we invest in us?
10. The County has quite a bit of financial influence and should use it to drive change.

This space is reserved for local art work from winners of the County's art contest.

Calling all artists and climate justice activists!

Montgomery County is hosting a competition for artwork to be featured in the County's climate action plan. What photos, drawings, poems, digital art, and memes (yes, we meant it, memes) invoke the need to protect your community from climate change? Help us to harness your creativity to sound the alarm about the climate emergency. Art is an incredibly important tool that will engage all County residents from a variety of backgrounds. Through this contest, we hope to reach those who might not have previously been engaged in the climate planning process, especially those from marginalized backgrounds who will be disproportionately impacted by changes in climate. The deadline for the contest in Sunday, January 31, 2021. For more information, please visit ***the art contest website***.

Appendix E: Resilience Ambassador Survey Results

Summary of the Resilience Ambassador Survey

October 16th, 2020

Prepared by Montgomery County CEX interns
Marcy Delos, Regina Fink, Julia McMurry & Tenzin Yangkey

The summary below was prepared following a quantitative and qualitative analysis of survey results. Information included below is meant to convey a summary overview of what survey respondents wanted to preserve, what they thought needed changing, and what solutions they wanted to see implemented. This is not an exhaustive account of our findings. The points bolded below represent ideas that were brought up repeatedly (not unique to one person or group) and which intersect with areas covered in the County's Climate Action Plan (CAP).

Imagining a future Montgomery County

Respondents were asked to imagine what kind of Montgomery County they want to see in their lifetime, and what their future would look like for them. Themes:

- **A county that is equitable, diverse, and inclusive**, with reduced segregation in our schools and neighborhoods; an end to racial profiling and racism; free of judgment where everyone feels accepted, welcomed, and heard; that supports mental health and provides meaningful opportunities to people with disabilities.
- **A county that enables people to live to their full potential,** can learn, work and have fun here; with local shops and markets; more resources for people who are systemically underserved; high-quality schools that provide a good education and where resources are distributed evenly; more well-paid job opportunities.
- **A safe, clean, healthy, affordable, and accessible place to live.** A peaceful county with less crime and violence; clean air; less carbon emissions; less waste and pollution. A county that provides more safe bus stops; faster buses; good public transportation; more accessible transportation throughout the county; safer walking, sidewalks, and crosswalks; fewer crashes, fewer total cars but more electric vehicles. Affordable housing and living; rental assistance for those in need; less poverty and homelessness.
- **A place to live that offers a sense of community**; that we feel pride to live in; where people help each other and care about each other; with County government helping those in need; a community that is well cared for; a community with a sense of humanity, respect, and joy; where people are making a better place for the next generation.
- **A county that provides a sense of place and places to have fun.** Respondents are looking for more opportunities for people to connect with each other; good recreational attractions and services; more fun things to do; more community events, festivals, and celebrations; new and renovated buildings and town centers; a place that knows its roots and keeps doors open to visitors.

A Sense of Community

- **Racial and ethnic diversity of the county is a point of pride** for many respondents. For others, this diversity is segregated to specific enclaves (particularly schools and neighborhoods, as well as broader areas/towns) that remain majority white/of higher income. Respondents highlighted **the need to protect their communities' diversity**, whether from gentrification or other forces. Many hoped to see the County become even more diverse in the future. Many **encouraged more celebration of the County's diversity** in the form of festivals, community gatherings, and other events. Some suggested this celebration could combat racism and empower immigrant communities.
- Residents **valued social service programs and the support that community members show for each other.** Residents highlighted appreciation for free public resources and services for low-income communities, including in response to the pandemic. Residents celebrated the commitment to helping each other, volunteering, and uniting in the face of adversity.
- Respondents voiced **worry about housing affordability/access and homelessness.** There were also worries about housing discrimination, as well as mixed feelings related to amount of housing development (excess or insufficient). Residents often described communities struggling to pay rent and rent increases (including during COVID). Solutions included rent control, rent assistance programs for low-income people and seniors, and increasing affordable housing. Residents were also concerned about the **challenges faced by people experiencing homelessness.** Solutions: providing homeless people with opportunities like jobs, essential resources, and support for mental health.
- While valuing the County's diversity, **residents were concerned about neighborhood segregation.** Concerns included dramatic economic disparities between different areas, how poverty/economic disempowerment cause crime, low racial diversity within neighborhoods and racial disparities in who has access to low-/high- income or poorly/well-resourced neighborhoods (with white communities benefiting, in contrast to Black and Latinx communities). While there was some appreciation expressed about living physically close to essential services, there was also worry about not being able to find nearby jobs or transportation to access distant jobs, high rent/parking prices near essential amenities (grocery stores, healthcare, public transit), and broader concern about high cost of living. Solutions: increasing affordable housing to create a more diverse neighborhoods and avoiding gentrification.

Civic Engagement and Community Leadership

- Respondents were happy to see civic engagement efforts like helping youth register to vote, but across the board **people wanted *more* from the County**.
- First, **more transparent communication and promotion concerning future events.** Many were unaware of events like town halls or concerned that their communities were unaware.
- Second, **more types of outreach and support for residents to raise their voices**. Many shared concerns about equity and access. Some populations do not have the time,

resources, or language access to engage unless the county takes active steps to support them. Some suggested a "suggestion-box" style website, others wanted more surveys, still others suggested regular newsletters and emails (perhaps targeted to specific communities). Wraparound supports for town halls and meetings could also help.

- Third, the **County must take resident concerns seriously and make good faith attempts to act on them**. Some respondents felt stereotyped or shut-down when sharing their concerns with officials, and many were frustrated at perceived inaction even when they had raised issues repeatedly. There was also concerns with the relative **lack of representation of BIPOC at high levels of government and other positions of power.** There are trust issues between communities and county officials.
- Finally, the County should **improve access to voting and elevate marginalized voices** through public art projects (like murals) and billboards.

Health and Pollution

- Respondents concerns' about health and wellbeing spanned from **unaffordable and inaccessible healthcare to the lack of health care-related information/awareness raising programs**. Residents want access to mental health and drug use therapy to destigmatize these issues and build a supportive community. Residents experiencing chronic illness and disabilities in particular find the health care system challenging to navigate. Residents are concerned about food justice, including poor neighborhoods' unequal access to healthy foods and schools lacking healthy options.
- Respondents also mentioned **concerns about pollution from cars,** especially because of increased use during the pandemic. Solutions offered: subsidizing Electric Vehicles in the county and reducing traffic flow.
- With heightened risk from COVID, some of the community members **favored strict COVID guidelines and enforcement.** Respondents were concerned about heightened COVID exposure or impacts (to their communities, families, or themselves) considering health insurance inaccessibility, low-income status, chronic illness or recovery from other conditions, elderly age, frontline essential jobs, and systemic racism.
- **Other concerns: inaccessibility of COVID testing, treatment and resources** deeply concerned the residents. With regards to environmental health, residents worried about air pollution and the need to keep neighborhoods clean.

Extreme Weather, Heating & Cooling

- **Affordability and accessibility to heating and cooling systems are central** to the issue of adapting to climate change. Students pointed out that schools lack reliable A/C and heating systems. For low-income residents food security, especially during extreme weather, was a concern. For **cold weather**, respondents called for repairs to existing heating systems and improvements like better building insulation. Solutions offered: sharing resources (jackets, sanitizer, food) and offering safe locations to go during storms. For **extreme hot weather** residents wanted A/C at job sites, essential buildings, public areas and low-income households. Some suggested more trees and shade spots,

increased access to pools and sprinklers, and more drinking fountains (especially near bus stops).

- **Public transportation is another area where heating and cooling systems needs to be installed**. Residents also saw the need of shelters for homeless people during cold winters and hot summers as they are at most risk.
- Broader **concerns included exposure-induced illness (hypothermia or heat stroke) and the cost of healthcare** needed to treat these. Some also mentioned mold problems, and the risk posed to asthmatics.
- Residents **worried about flooding** feared it would lead to power outages (for houses and public buildings like schools), destruction through water damage and falling trees, and dangerous driving conditions. They wanted better sewage systems, more storm drains, and emergency information phone lines.
- Residents frequently cited a **need for further education and planning regarding extreme weather** (ex: pamphlets, online plans for county, hotlines to call). Respondents cited concerns with lack of community preparedness, especially for homeless and low-income individuals.

Traveling in the Community

- **Problems with public transit included accessibility (lack of access near homes, schools, places of employment), affordability, service quality, and timing issues that resulted in long commutes**. Many also mentioned unreliability of the transit schedule.
- **Issues with cleanliness** were cited as concerns both before and after (enhanced) during the COVID-19 pandemic. Solutions include: increasing private car use, staying at home, and providing hand sanitizer dispensers on transit. Many respondents, almost exclusively female, **noted issues with sexual harassment**, even assault, while on public transit or while walking at night. Solutions included: installing better lighting at night and cameras on transit.
- Respondents noted **concerns walking on busy roads** with sub-par sidewalks/crosswalks and reckless drivers. Highway 29 was mentioned in a response as a particularly dangerous crossing. Solutions include: police directing traffic at dangerous intersections, infrastructural improvements (ex: speedbumps), and improved signage or driver's education.

Safety

- Respondents mentioned **police as either positive (effective, wanted more of) or negative (issues with profiling/racism/brutality)**. Some thought police abused their power and could not be trusted to be called in an emergency situation and were not effective in schools. Others welcomed police presence in their neighborhoods, schools, and as forces to combat crime and traffic issues. Respondents mostly welcomed security guards in communities and schools.
- Other safety issue included crime rate (higher in certain neighborhoods), need for security cameras, gang violence, gun violence, school shooting fears, fear of assault in

schools. Some respondents considered the County a safe place in general, but were able to cite times they felt unsafe.

Economic & Educational Inequities & Empowerment (many issues below are especially pertinent to youth, who made up a large proportion of those surveyed)

- Respondents cited a **need for more job opportunities** (for youth, BIPOC communities, low-income communities, and people with disabilities), issues with **wage inequity,** and discrimination in the hiring processes. Many were concerned about **financial security,** worsened by the pandemic. Some feared returning to work because of increased exposure to COVID. Others were unemployed because of the pandemic.
- Many wanted **more youth facilities**, places to gather/organize/share energy and ideas, mental health services, and sports opportunities.
- Respondents sometimes expressed **pride in MoCo's great school system and the diversity it contains,** although many residents highlighted **education inequities** within schools. There is a perception white students have more access to magnet, IB & AP classes while immigrant students are stuck in ESOL programs. Students noted inequities in access to laptops, tutors, college prep, SAT prep and the lack of affordable daycare (some need to care for siblings/children). These issues have been exacerbated by the pandemic (ex: need for internet/laptops).
- **This inequity was also cited between schools and consortia**, specifically the distribution of funding across consortia segregated by income and/or by race. Other inequities include lack of resources, attention, educational quality, and opportunities for student expression and leadership. Solutions offered included rezoning and redistribution of resources.
- In schools and classrooms, respondents noted issues of **mental health** and suggested expanding mental health services and drug use prevention/therapy. Respondents also mentioned instances of **racial discrimination**, specifically stereotyping, disproportionate punishments for Black students, and dismissing voices of BIPOC students. Solutions offered include anti-bias training, educational leadership listening to student feedback and stories (ex., racism, sexual harassment) and having follow-through/accountability, and redesigning the curriculum to cover racial issues (systemic racism, history that is not "whitewashed" by centering dominant white narratives), gender equity, etc.
- Other issues included **disability discrimination** and the need for environmental education.

MONTGOMERY COUNTY CLIMATE ACTION PLAN

Building a Healthy, Equitable, Resilient Community

APPENDICES

PUBLIC DRAFT

MONTGOMERY COUNTY,
MARYLAND GOVERNMENT

101 Monroe Street,
Rockville, MD 20850

Montgomerycountymd.gov/climate/