

Resiliency

Improve the capacity of our community, homes, businesses, and natural environment to prevent, withstand, respond to, and recover from climate change impacts such as rising temperatures, more frequent and intense heat waves, heavy rainfall and severe storms.



Incorporate climate resilient building and infrastructure design features in new buildings and retrofits

Action C-20	Objective Incorporate new building codes and education and incentive programs to protect building occupants, infrastructure, and the environment from the impacts of climate change.				
	Metrics Milestone/Status update				
	Target Community Resiliency				Development Stage Proposed
	Lead Planning and Development Services				City Upfront Cost -
	Partners Public Works (Engineering, Environment)				City Operating Cost Coordinate with C-03, C-22, C-24, M-09, and M-13
GHG Benefit	Resiliency	Feasibility	Health	Equity	Co-Benefits
+	++	++	++	+	Economic, Housing, Safe and Livable Neighborhoods, Stewardship of Infrastructure

Building codes and development standards are traditionally based on historical data. Since the past is no longer a reliable predictor, future development, redevelopment, and building retrofits should consider climate resiliency measures. Although green building codes, stormwater management requirements, and energy conservation codes address many aspects of building and structure resilience, some gaps may be significant enough to warrant additional considerations to help new buildings and existing buildings become more resilient to more frequent high heat conditions, severe weather events, and new precipitations patterns. Rockville should assess how to best incorporate climate resilience in updates to building codes and consider education, grants or rebates to improve the resiliency of existing buildings.

- Flooding:** A few areas in Rockville may be more susceptible to urban flooding and require flood proofing measures, such as directing water away from buildings to prevent rainwater intrusion, floodproofing doors and walls on the ground floor, and raising mechanical equipment above potential flood levels. Some communities, like Alexandria, have developed a Flood Mitigation Pilot Grant program to assist property owners by providing education and grants to help make building improvements for flood and moisture prevention.
- Severe weather:** Other resiliency measures help structures withstand extreme weather conditions, such as high heat, severe storms, and drought. Measures may include wind resistance, water conservation and rainwater capture, heat-resistant landscaping, outdoor shading, reduction of building heat retention, efficient mechanical systems and appliances, energy storage, peak power reduction, on-site renewable energy, natural solar lighting, and passive survivability design that allows buildings to continue to have power to operate during brownouts or blackouts.



Equity Considerations

Ensure that any new building codes protect housing affordability and local businesses.

Vulnerable communities may need resources to retrofit their homes to improve resiliency.



**Action
C-21**

Partner with Federal Emergency Management Agency to update the Flood Insurance Rate Maps (100-Year floodplain maps) used to implement the National Flood Insurance Program

Objective	Update Flood Insurance Rate Maps in the Federal Register				
Metrics	Maps updated in Federal Registry; Property owners educated on impact of update and inquiries addressed				
Target	Community resiliency	Development Stage	FY 2022 - 2023		
Lead	Public Works (Engineering, Environment)	City Upfront Cost	Utilize Existing Resources		
Partners	Public Information Office, FEMA, Montgomery County, Maryland Department of the Environment, Planning and Development Services	City Operating Cost	-		

GHG Benefit	Resiliency	Feasibility	Health	Equity	Co-Benefits
N	++	+++	+	+	Economic, Housing, Stewardship of Infrastructure, Safe & Livable Neighborhoods

Rockville entered the National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA), in 1978 when it adopted its first floodplain ordinance as Chapter 10 of the Rockville City Code. Chapter 10 provides for protection of, and limits development within, the 100-year floodplain. The term ‘100-year floodplain,’ now known in Federal regulations as the ‘Special Flood Hazard Area’ or SFHA, is the area near a stream that has a one percent chance of being inundated by floodwaters in any given year. Communities that participate in the NFIP are eligible for Federal benefits, such as special emergency assistance funding. More importantly, the communities’ property owners are eligible to purchase flood insurance for insurable structures at discounted rates. Owners of insurable structures in the floodplain must purchase flood insurance to secure a federally-backed mortgage.⁴¹

FEMA map changes occur periodically, as the agency deems necessary. The City’s first maps were developed in 1976. In 2006 these were partially updated, and the 1978 development and flood boundary conditions were overlaid onto 2006 base maps that showed then-current topography and roads but did not update stream flows or flood modeling, Therefore, the City is currently relying on maps created in part with data from 1976.

Floodplains and flood risk change over time due to weather patterns, land development, and erosion, and therefore the 100-year floodplain changes as well. Rockville is currently participating in a Flood Insurance Study being conducted by FEMA to update the City’s floodplain maps. Floodplain maps identify the 100-year floodplain for streams with drainage areas of one mile or larger and inform communities about local flood risk. The maps help set minimum floodplain standards, which helps communities build safely and resiliently, and they also determine the cost of flood insurance, which helps property owners financially protect themselves against flooding.

⁴¹ https://www.fema.gov/sites/default/files/2020-07/fema_nfip_map-change-need-to-know-compliance.pdf

The updated FEMA floodplain maps will capture the new 100-year floodplain under current development and precipitation conditions. The changes are likely to affect some residential and commercial property owners whose property was not historically in the floodplain. These impacted property owners may need to obtain coverage under a new flood insurance policy or alter existing policies.

The City of Rockville is a partner in this map update process, but FEMA develops the new maps and sets the process timeline. As partners, the City will:

- Share our existing areas of flooding concern and providing FEMA with relevant as-built information on significant road culverts, bridges and stream modifications made since 2006.
- Review preliminary updated maps and submit comments about possible mapping inaccuracies.
- Coordinate with FEMA, MDE and Montgomery County on a comprehensive public information process to explain the new maps and how changes may affect City property owners.
- Become familiar with the new NFIP mapping format and Risk Rating 2.0 insurance evaluation process to answer Rockville property owner questions and help guide them through the map appeals process,
- Update City Code Chapter 10, Floodplain Management, to incorporate the new floodway component that is required by the State and Federal governments for compliance with the NFIP.
- Revise the floodplain permit processes accordingly.

FEMA floodplain maps show risk associated with existing conditions for larger streams. They do not show risk associated with smaller streams like those that flow through the King Farm and Falls Grove neighborhoods. Further, these maps represent the risk associated with current condition and do not forecast potential flood prone areas based on predicted increased in number and intensity of rain events. Action M-13 outlines plans to forecast and mitigate potential flood issues associated with climate change.



Work with Montgomery County and community partners to provide cooling centers, resilience hubs and other services to strengthen community resiliency

Objective	Expand community services to increase community resiliency to high heat conditions, emergencies, and extended grid outages				
Metrics	Milestone/Status update				
Target	Community resiliency	Development Stage	Proposed expansion		
Lead	Recreation and Parks, Housing and Community Development	City Upfront Cost	-		
Partners	Public Works, Public Information Office, Montgomery County	City Operating Cost	To Be Determined		
GHG Benefit	Resiliency	Feasibility	Health	Equity	Co-Benefits
N	+++	++	++	++	Safe & Livable Neighborhoods, Efficient & Effective Services

Extreme heat events, poor outdoor air quality days, severe storms and power disruptions increase human health risks, especially for sensitive populations such as children, the elderly, low-income and persons with disabilities. In addition to coordinating with the County on emergency plans, hazard mitigation and preparedness, more local actions may be needed to adapt to changes in climate and respond to severe weather events. Rockville currently provides critical community services that support resiliency through the operation of cooling centers, emergency notification and assistance programs, and community support services which can be adjusted to address the impacts of a changing climate.

- Cooling centers:** The City operates four cooling centers when the temperature hits 95-plus degrees, or when a code red air quality alert is issued for Montgomery County. The centers are located at the following facilities: Lincoln Park Community Center, Thomas Farm community Center, Twinbrook Community Recreation Center and the Rockville Senior Center.

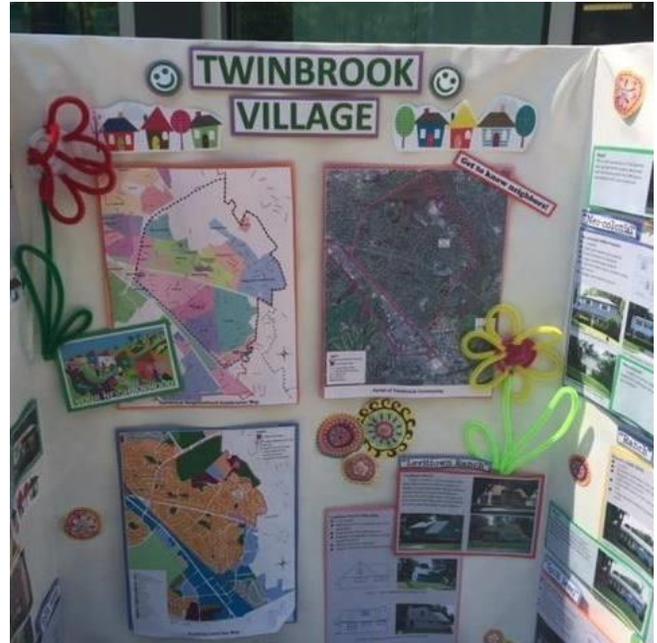


- Emergency notifications:** Rockville operates the “Alert Rockville” emergency communications system which sends time-sensitive emergency alerts, notifications and updates to devices. This system enables Rockville to provide critical information in a variety of situations, including public safety, severe weather and traffic updates.

Equity Considerations

The City could explore outreach methods to ensure that all members of the community know about the availability of community or emergency services. The City could solicit feedback from community leaders on ways to improve the delivery of services to better meet community needs.

- Social connections and support systems:** Social networks are important, especially during times of emergencies. Rockville’s “villages” program includes multigenerational and multicultural neighbor support networks. The program fosters social connections through activities and events, and coordinate volunteer help at home using a neighbor-helping-neighbor model. Villages are in formation in Rockville’s West End, East Rockville, Twinbrook and King Farm. Villages coordinate friendly visits, check-in phone calls, social events, health and safety events, grocery and pharmacy pickups and delivery and transportation to medical appointments. These volunteer networks can be used to ensure that vulnerable neighbors are checked upon during snowstorms, severe weather or heat waves to strengthen community resiliency.



- Resilience Hubs:** To further expand community resiliency, the City could explore state and federal resiliency technical assistance and grant funding programs to expand upon current services. The City could explore working with County and State agencies to support local emergency hubs for the distribution of emergency services during extended power outages. The Maryland Energy Administration defines a resiliency hub as a facility that is located within short walking distance from economically disadvantaged populations that can serve as a heating and cooling center, provide refrigeration for medications and milk for nursing mothers, and allow for charging of small devices, like cell phones and computers. Buildings such as schools, religious institutions, community centers, senior centers, and affordable housing buildings with community spaces are recommended examples of suitable facilities. The hubs are meant to be meeting places and information centers for the surrounding community during an outage and are intended to augment -- not to replace -- emergency shelters or hospitals. The City could explore state grants to establish resilience hubs.



Work with Montgomery County and community partners to measure and map urban heat islands to mitigate exposure to extreme heat

Objective	Identify areas of extreme heat especially in key transportation connections and vulnerable communities to focus mitigation strategies				
Metrics	Milestone/Status update				
Target	Community resiliency to heat	Development Stage	Proposed		
Lead	Public Works (Environment)	City Upfront Cost	Montgomery County is seeking grant for project; may require City cost-share		
Partners	Montgomery County, community volunteers	City Operating Cost	-		
GHG Benefit	Resiliency	Feasibility	Health	Equity	Co-Benefits
N	++	+	++	++	Economic, Mobility, Safe & Livable Neighborhoods, Efficient & Effective Services

Urban heat islands are areas of developed land where pavement, walls and rooftops are prevalent and absorb and release heat during sunny hot days and subsequent evenings. Urban heat islands create conditions that could be 10 to 15 degrees higher than surrounding agricultural or wooded areas. Heat islands are not caused by climate change, but they are worsened by the heat waves that climate change makes more frequent, intense, and unrelenting. Urban heat is responsible for more harm to human health than any other climate stressor experienced by Rockville. Exposure to heat whether on the job, while playing sports, or simply traveling on errands can contribute to higher emergency room visits, heat stroke, exacerbation of other health problems, sometimes even leading to death.

Rockville will work with Montgomery County and regional partners to pursue options for mapping urban heat islands in the city, such as grants for citizen science assessments that identify fine-grained temperature patterns in the urban landscape. The data can inform a future heat island mitigation strategy, such as identifying areas of high pedestrian and transit travel, low income and socially vulnerable neighborhoods, and economic centers that have lots of pavement and fewer trees and greenery. Prioritizing these areas for tree planting along transportation corridors, and incentivizing green roofs, cool roofs and cool pavements, promoting other forms of shade such as canopies, and locating water elements or misters in these areas can help reduce heat impacts. These mitigation measures will help enable active transportation, reduce health exposures for those that already experience health challenges and less access to health care, and ensure that areas with high economic activity are as comfortable as possible to promote vitality and community resilience.

Equity Considerations

Like COVID-19, economic downturns and other forms of adversity, low income and communities of color suffer most from weather extremes. This measure can be designed to be aimed at vulnerable neighborhoods with less green space and more reliance on active transportation.

 Action C-24	Increase tree planting, green, cool, and photovoltaic roofs, and cool pavements on public and private property				
	Objective To reduce urban heat island effects.				
Metrics Number of installations					
Target Resiliency to urban heat			Development Stage Proposed expansion		
Lead Public Works (Engineering), Planning and Development Services			City Upfront Cost -		
Partners Parks and Recreation			City Operating Cost To Be Determined Cost share with C-03, C-09, C-17, M-09		
GHG Benefit +	Resiliency ++	Feasibility ++	Health ++	Equity +	Co-Benefits Safe and Livable Neighborhoods, Economic

Enhancing environmental stewardship by increasing urban greening, stormwater management, cool roofs and pavements, and distributed renewable energy in new and existing buildings will help reduce heat islands throughout the community and help promote improve air quality and protect public health. A **green roof**, or rooftop garden, is a vegetative layer grown on a rooftop. Green roofs provide shade, absorb rainwater and pollutants, reduce temperatures of the roof surface and surrounding air, and can even provide habitat. **Cool roofs** and **cool pavements** are made of highly reflective materials that remain cooler than traditional materials during peak temperatures. **Pervious pavements** are another form of cool pavement that cool nearby air through evaporation. Pervious pavement and green roofs are also stormwater management environment site design (EDS) facilities that meet SWM requirements for development and redevelopment. **Solar photovoltaic (PV) and solar shingles** generate onsite renewable energy and increase a building’s resilience to power outages if connected to on-site storage. This action could also promote economic prosperity by creating local jobs in installation and maintenance. Where conflicts between environmental benefits exist (i.e. trees, stormwater or solar), the City should develop a flexible, case-by-case approach to balance environmental returns.

- Tree Planting:** Increasing tree planting and maintenance will enhance carbon sequestration and mitigate environmental hazards like heat islands, air and water pollution. Healthy trees and forests also provide opportunities to mitigate impacts of extreme weather events (heatwaves, extreme rainfall or flooding). Tree planting programs under Action C-17 and M-09 encourage tree planting and maintenance on both private and public lands. Updating the Forest and Tree Preservation

Equity Considerations

It is important to ensure that all neighborhoods have access to resources and programs to reduce heat-related impacts in the community, impacts of flooding, and protect public health.

This action may negatively impact racial equity and social justice if adhering to codes would require costly investments unless they are offset with financial opportunities and incentives. These might include tax credits and grants, Montgomery County Green Bank, and Single-Family Rehabilitation Program using Community Development Block Grant.

Ordinance to optimize overall community benefits will support this action's success.

- Green/PV/Cool Roofs:** Rockville should evaluate building codes, zoning, and stormwater ordinances to strengthen requirements and/or provide incentives for existing and new roofs to be (1) green roofs, with native plants, (2) solar photovoltaic (PV) systems tied to the building, or (3) cool/albedo roofs. The building code should prioritize green and solar roofs over cool roofs and include appropriate site-specific exemptions (ex. nearby tree shading, mechanical equipment placement, historic design considerations, or rooftop uses such as decks or pools). Performance goals could be incorporated into code requirements for permit approval. Cool roof materials should have a minimum initial solar reflectance (i.e., 0.70 for low-sloped roofs, and 0.40 for steep-sloped roofs) and a minimum thermal emittance (i.e., 0.85).
- Cool Pavements:** Cool pavements reduce heat island effects by staying cooler in the sun than traditional pavements. *Reflective* cool pavement has a lighter color and chemical properties that turn sunlight back toward the atmosphere rather than absorbing heat like dark asphalt. *Microsurfacing* is an option that involves adding a layer of reflective materials. *Evaporative* cool pavement relies on rainwater seeping into its porous surface and then cooling the pavement and ambient air through evaporation. Rockville could evaluate residential and commercial codes, zoning, and stormwater management requirements to increase the use of cooler pavements through requirements or incentives. For example, Rockville could consider developing pavement standards or incentives for specific land use types. For example, pervious pavement for parking lots, or microsurfacing to increase the albedo effects on sunny areas that receive minimal foot traffic. There are many alternate paving solutions that can be used based on the functions they serve with costs ranging from minimal to substantial. Rockville should follow the costs and availability of these technologies and other sustainable pavement innovations such as low CO₂ concrete.





**Action
M-11**

Continue assessing the vulnerability of Rockville’s critical infrastructure, facilities, and services, and prioritize areas for improved climate resiliency

Objective	To assess climate risks and increase the adaptive capacity of Rockville’s infrastructure, facilities, and services where needed.				
Metrics	Milestone/Status update				
Target	City and Community Resiliency	Development Stage		Proposed expansion	
Lead	Public Works, Recreation and Parks, Police	City Upfront Cost		\$180,000 for consulting services for new Emergency Operation Plan and Continuity of Operation Plan	
Partners	Montgomery County, Planning and Development Services	City Operating Cost		Coordination with M-14 M-13, M-10, and M-09	
GHG Benefit	Resiliency	Feasibility	Health	Equity	Co-Benefits
N	+++	++	++	++	Safe and Livable Neighborhoods, Stewardship of Infrastructure, Efficient and Effective Services

Past precipitation and weather patterns are no longer expected to continue to remain the same, but most plans, operating assumptions, and building and infrastructure standards rely on historic data. Therefore, many communities are examining ways that built infrastructure and services to the public may need to be adjusted or fortified given changing weather patterns. Prolonged and more frequent heat waves, intense rainfall that can overwhelm drainage systems and cause flooding, and intense weather events such as tropical storms and strong winds are occurring more frequently. The City Emergency Operation Plan and Continuation of Operations Plan must recognize changing conditions to ensure continued critical services to protect Rockville residents, businesses, students, and visitors, and reflects responsible stewardship of public resources, with special attention to socially vulnerable community members.

- Work with the County to ensure a robust Hazard Mitigation Plan:** Public Works, the Department of Recreation and Parks, and Police are the lead for several local operations. For example, the City responds to water and sewer emergencies within its service area and snow and ice operations. Montgomery County is responsible for the community [Hazard Mitigation Plan](#). The City adopted the County Hazard Mitigation Plan on August 22, 2019. The City works closely with the County in developing this plan. The County runs the overall emergency response functions for the County. This action entails working with the County to ensure the robustness of their functions under a range of climate future conditions. In addition, other departments will have their own insights about how climate change might factor into their services and operations.

Equity Considerations

Ensuring the City Emergency Operation Plan and Continuity of Operations Plan deliver high-quality services under emergency situations is particularly important for those already experiencing social disadvantages or health disparities. Special attention should be paid to protecting and enhancing City service functions for low income and socially vulnerable community members.

Future hazard mitigation planning efforts could assess potentially hazardous materials and sites (e.g., Lincoln Parks' proximity to a Washington Gas utility center) to determine if extreme weather events would put such communities in particular danger.

- **Explore multilingual emergency alert opportunities:** Examine emergency alert and other public communication around disaster preparedness, emergency response, and recovery assistance to ensure that it reaches all residents and businesses. The City can explore using other media platforms or communication methods that are appropriate for reaching diverse cultures, including potentially offering emergency alerts in different languages. The City should ensure that all those who need it should be able to access disaster recovery resources.
- **Incorporate climate change considerations into local plan updates:** With the development of this Climate Action Plan and other linked initiatives, including the Comprehensive Plan, the City has begun preliminary work to explore how climate change is impacting and may continue to impact services, facilities, and infrastructure. The changes in community hazards due to climate change necessitate comprehensive revisions to the existing City Emergency Operations Plan (EOP) and Continuity of Operations Plan (COOP). Preliminary estimates for consulting services to update Rockville's EOP and COOP are \$180,000 for a process that would take approximately two years. Some specific activities are already underway to assess risks and resiliency of City infrastructure. For example, the US Environmental Protection Agency required a Risk and Resilience Assessment and Emergency Plan for the Rockville Water Treatment Plant.
- **Seek to update planning and engineering standards where applicable:** Incorporating climate risk considerations in city facility, infrastructure, and program-related plans, especially critical functions such as water, sewer, and stormwater services are key goals of this effort. Coordinate with outside agencies, such as MDE and the County to evaluate infrastructure planning assumptions and program planning assumptions to assess whether adjustments or additional levels of planning or preparedness are warranted.
- **Assess critical functions and infrastructure performance under climate change:** Examine location of mechanical equipment that support critical public service functions and whether they could be subject to flooding or storm impacts. Identify specific projects to enhance transportation, stormwater, or water infrastructure performance at vulnerable locations. Examine the transportation network and accessibility of critical infrastructure in light of potential flood impacts, power outages, or other chronic issues that could be caused by more intense precipitation patterns. Assess neighborhood risks associated with extreme weather impacts on hazardous waste storage or other potentially hazardous sites. Assess compounding or cascading impacts especially for critical locations (schools, nursing homes, day cares, a potential future emergency operations center) involving heat, power outages, flooding and accessibility, drainage, or other ongoing or health-related climate impacts.
- **View all City decisions about operations, programs, and capital plans through a climate change and equity lens:** This action will involve understanding current and future changes and how to adjust city infrastructure, facilities, operations and services to anticipate and reduce or eliminate long-term risks to infrastructure, ecosystems, people and property from hazards and their effects. For example, the City operates a water treatment plant, water/sewer/stormwater

utilities, various facilities, local road network, and the Police Station. The City operates a senior center, a nature center, three community centers, a swim and fitness center, community gardens, and many accompanying programs. The City also provides trash and recycling services, snow clearing, and responds to other emergency issues. The Housing and Community Development Department supports residents by helping connect them to assistance services. Planning and Development Services reviews and processes numerous permits and development reviews, serving the City's property owners and businesses. The City's parks include many recreational and natural assets including athletic facilities, community gardens, and forestland. Assessing the vulnerability of City facilities and services and identifying ways to enhance climate resilience could be accomplished ad-hoc or more holistically through development of an internal policy or Climate Resilience Plan.

- **Update design guidelines for City facilities to incorporate climate changes:** In particular, the City should examine opportunities to design stormwater management and landscapes that can absorb and filter larger quantities of water, to improve water quality to the extent possible and reduce flooding. Some cities have used approaches such as designing park areas to hold water during a cloudburst to keep surrounding buildings safe. The City employs some operational methods such as draining stormwater facilities ahead of a storm to allow them to hold more water. These methods could be more systematically implemented or expanded.
- **Look for funding and technical assistance opportunities:** Maryland Energy Administration, FEMA, and others offer funding opportunities for resiliency projects. For example, the City was recently awarded technical assistance to assess the feasibility of a solar-powered microgrid to power City functions that would be located at 6 Taft Court property in the future. A microgrid would ensure continuity of critical operations during power outages. The City should also explore funding and technical assistance for flood assessment and mitigation plans and projects.
- **Leverage existing resources where possible:** The City can leverage resources of other agencies that have overlapping efforts including the federal government, the State of Maryland, and members of the Metropolitan Washington Council of Governments. Montgomery College, Montgomery County Public Schools and Maryland National Capital Park and Planning are also considering climate change in their policies. As the County continues to develop their climate resiliency strategy, there will be future opportunities to work on a joint effort involving engineers, program managers, and facility operators about what climate change means for their mission and start to identify strategies to improve the City's resilience to climate change and other disruptions.

 Action M-12	Advocate for state and federal authorities to update stormwater infrastructure design, operations and maintenance standards to accommodate new rainfall/ storm event projections and help reduce projected flooding issues				
	Objective	Incorporate updated design standards/operations and maintenance standards for stormwater infrastructure			
Metrics	Milestone/Status update				
Target	Community Resiliency	Development Stage	MDE is updating data and standards		
Lead	Public Works (Engineering and Environment)	City Upfront Cost	Utilize existing resources		
Partners	Maryland agencies, Planning and Development Services	City Operating Cost	-		
GHG Benefit N	Resiliency ++	Feasibility ++	Health +	Equity +	Co-Benefits Save and Livable Neighborhoods, Stewardship of Infrastructure

Polluted stormwater runoff from developed areas is one of Rockville’s greatest water quality challenges. Whenever it rains, water flows off parking lots, roadways, rooftops, and other impervious surfaces, picking up pollutants and litter. This contaminated runoff drains directly into streams, rivers, and eventually the Chesapeake Bay potentially without any treatment. Stormwater runoff also contributes to urban flooding that has the potential to damage private property and public infrastructure. Paving over natural areas with impervious surfaces that don’t absorb rain dramatically increases the amount of water running off the land during storms. As climate change brings more frequent and intense storms, stormwater runoff volumes without modern SWM treatment will continue to increase, exacerbating existing flooding and pollution problems—and creating new ones. Heavy downpours can overwhelm existing stormwater management facilities and storm drain networks and cause increase damage to Rockville streams. As a result, communities can experience more localized flooding and greater runoff of contaminants such as trash, nutrients, sediments, or bacteria into local waterways.

While Maryland has progressive stormwater management requirements that the City incorporated into City Code for new and redevelopment projects, the design standards are outdated. Facilities that are built today are not designed to treat and convey the larger intensity storms that are occurring now and forecasted to occur even more frequently in the future. The 2021 Maryland General Assembly approved legislation requiring the Maryland Department of the Environment (MDE) to update specified stormwater management regulations and criteria once every five years to incorporate specified updated precipitation data.⁴² Among other things, in updating the regulations, MDE must conduct specified public outreach and consult with specified entities. The City should continue to advocate for MDE to update design standards and operation and maintenance standards to ensure stormwater management infrastructure (including conveyance infrastructure) constructed today can help mitigate projected climate related water quality and flooding issues in the future.

⁴² <https://mgaleg.maryland.gov/mgawebsite/Legislation/Details/SB0227>



Assess Rockville’s risk of flooding and develop a Flood Resiliency Master Plan to reduce or mitigate flooding impacts

Action M-13

Objective	Identify areas that are vulnerable to flooding and associated flood mitigation options. Position Rockville to apply for grant funding for flood mitigation projects.				
Metrics	Plan milestone/Status update				
Target	Community Resiliency	Development Stage	Proposed FY 2023		
Lead	Rockville Public Works	City Upfront Cost	\$1,500,000 for consulting services		
Partners	Planning and Development Services, Recreation and Parks	City Operating Cost	Project implementation costs to be determined		
GHG Benefit	Resiliency	Feasibility	Health	Equity	Co-Benefits
N	+++	++	+	+	Safe and Livable Neighborhoods, Stewardship of Infrastructure

Heavy downpours have increased in frequency and intensity in the last 50 years. They are expected to become more frequent and intense as global temperatures continue to rise. As a result, the average 100-year floodplain is projected to increase in area by 45 percent by the year 2100 and flash flooding could impact low-lying, inland areas (adapted from [Manage Flood Risk | US EPA](#)). Through progressive stormwater management (SWM) regulations and participation in the Federal Emergency Management Agency’s (FEMA) National Flood Insurance Program (NFIP), the City has largely kept development out of currently delineated floodplain areas. It has also installed, through private development and public retrofit projects, a large number of SWM facilities designed to treat and reduce the volume of water running off impervious surfaces. However, the City anticipates that climate change will increase flood impacts to developed property.

This issue was highlighted on September 1, 2021, when Tropical Storm Ida hovered over Rockville, recording 2.56” of rainfall during the peak 30-minute period, with a total of 2.97” rainfall in only 45 minutes. This resulted in unprecedented flash flooding in parts of Rockville. Using linear interpolation between the NOAA 200-year and 500-year storms for that duration puts Ida at a 327-year, 30-minute duration storm event. The storm impacted many residents and properties, including rendering uninhabitable the bottom floors of two high-rise apartment buildings.

To mitigate future flood risks and improve resiliency, Rockville can work with a consultant and community stakeholders to develop a Flood Resiliency Master Plan that encompasses Rockville’s entire 13.5 square miles. The City has several older communities that were developed before modern stormwater management requirements for quality and quantity and likely to have major impacts associated with flooding. Completely mitigating all potential flood risks is impossible. Therefore, to ensure equitable, transparent, and consistent implementation of limited flood mitigation funding, the City will first develop a complete and thorough delineation of potential flood risk areas via this Master Plan.

The plan will expand the analysis past the FEMA regulated threshold (Action C-21) to include headwater streams near Woodmont Country Club, King Farm and Fallsgrove neighborhoods,

Equity Considerations

Ensure plan prioritizes flood mitigation project to protect human safety and property damage, especially vulnerable communities.

as well as assessing pluvial flooding, or in-land flooding not associated with rivers and streams. It will also devise an equitable and transparent framework for prioritizing identified flood vulnerable areas and issues throughout the city. A comprehensive evaluation of the entire city is needed to ensure projects with the biggest need/impact are implemented first and equitably to avoid a piecemeal, complaint-based reactive prioritization process. The Flood Resiliency Master Plan will be a multi-year effort to:

1. Evaluate current stormwater management system capacity and flood impacts;
2. Identify current flood hazard areas;
3. Forecast potential impacts associated with a range of climate change projections;
4. Develop a stakeholder informed project prioritization tool based on risk tolerance;
5. Develop feasibility level designs to help mitigate current and projected flood impacts; and
6. Implement high priority projects.

The plan will also identify systemic changes to combat the future impacts of flood events more effectively. These systemic changes may include updates to existing zoning and stormwater management codes, and changes to the design standards used during Capital Improvement Project implementation, etc. The Flood Resiliency Master Plan that will identify areas of concern and outline specific actions the City can take to mitigate the impact of flooding on residential and commercial property. Typical actions may include culvert upgrades, property purchase and demolition, quantity control-type SWM facility retrofits, and reductions to impervious surface wherever possible. Many of the current flood mitigation grant opportunities currently available from the federal and state governments as well as private foundations require a robust flood mitigation plan for eligibility. Therefore, this effort will position the City to apply for flood mitigation project funding in the future.



 Action M-14	Develop and implement Heat Illness Prevention Plans for various City services and operations				
	Objective	Protect the health and safety of workers and community members using City services from the health impacts of high heat.			
Metrics	Milestone/Status update				
Target	Reduce human exposure to high heat	Development Stage	Ongoing		
Lead	Human Resources	City Upfront Cost	-		
Partners	All Departments	City Operating Cost	-		
GHG Benefit N	Resiliency ++	Feasibility ++	Health ++	Equity +	Co-Benefits Efficient & Effective Services

Rockville already experiences high heat periods during the summer and climate models project heat waves to worsen in frequency and intensity. Heat Illness is a serious medical condition resulting from the body’s inability to cope with a particular heat load and may include heat cramps, heat exhaustion, heat syncope, and heat stroke. This greatly impacts employees that work outdoors or in other spaces where environmental risk factors for heat illness are present. Under Occupational Safety and Health Administration (OSHA) law, employers are responsible for providing workplaces free of known safety hazards. An employer with workers exposed to high temperatures should establish a complete heat illness prevention program. Human Resources has already developed a Heat Illness Prevention Plan for the Recycling and Refuse Division whose workforce is exposed to high heat working condition during the summer. The plan contains specific measures for high heat events; which include but are not limited to:

- monitor the weather (current and forecast) and adjust workloads accordingly;
- reduce workplace heat exposure by implementing work practice controls (e.g., modified summer hours to accomplish work during cooler periods, shade, etc.);
- train workers to be vigilant for signs of heat illness and respond quickly;
- ensure workers are acclimatized before working in hot environments;
- provide appropriate hydration;
- ensure and encourage rest/cool-down breaks;
- have an emergency plan ready to respond to a heat related illness.

This model may be used to develop plans to protect the health and safety of other members of our outdoor workforce and community members receiving City services (e.g., youth participating in outdoor summer camps) during hot weather.

Equity Considerations

Social and economic inequities, as well as individual characteristics, place some individuals and communities at greater risk than others for the effects of extreme heat. The very young and the elderly are less able to sense and adapt to changes in temperature. Those with conditions such as obesity, diabetes or renal, cardiovascular and respiratory diseases are at higher risk of heat illness, including changes in medication effects and other complications.