

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Energy and Environment

MEMORANDUM, Attachment A

SUBJECT: Background Details and Descriptions of Potential Actions for the Flooding Task Force

BACKGROUND DETAILS

Flooding on September 10, 2020 Highlights the Need for Action

The amount of rainfall that fell between 1:00 and 2:30 pm on September 10 equates to a 10-year or 25-year storm, or a storm that has a 10% or 4% percent chance respectively of occurring in any given year. Based on post-event canvassing data from the District Homeland Security and Emergency Management Agency (HSEMA), over 240 residents reported damage following the storm on September 10 and 105 residents reported “Major” damage. Reported consequences of the flood included standing water, standing sewage, residual sediment, damaged flooring, wet drywall, damaged utilities, and mold growth. Statistics from the Federal Emergency Management Administration (FEMA) show that just one inch of water inside a structure can cause \$25,000 in damage. The types of flooding that happened on September 10, 2020 are known as an interior/stormwater and a sewer line back up flood. They are just two of four types of flooding that the District is vulnerable to (the others being coastal and riverine flooding), all of which require action to ensure the District’s resilience into the future.

Future Trends Will Exacerbate Flood Risk

The District anticipates that flood risk will increase in the future for all types of flooding. According to data from “The 2018 State of High Tide Flooding and 2019 Outlook” by the National Oceanic and Atmospheric Administration (NOAA), there was a record twenty-two (22) high tide flood days in the District in 2018. The previous record was ten (10) high tide flood days in a year, and the average number of high tide flood days in 2000 was just three (3) days. Modeling results referenced in the District Hazard Mitigation Plan predict that the District will have the most significant increase in tidal flooding events of any East Coast city by 2045. Additionally, the DC Hazard Mitigation Plan has identified six recorded hurricanes that have impacted the District since 2000. While damage from these events has been relatively limited, a direct impact from a hurricane making landfall in the National Capital Region is a plausible future risk that would cause unprecedented devastation. Interior/stormwater and sewer line back up flood risk is also expected to increase due to climate change. “Climate Ready DC” projects that we will have more frequent and more intense rain events in the future, making events like September 10, 2020 more likely to happen and potentially more devastating.

RELEVANT REPORTS

- Flood Risk Governance Structure Review and Recommendations (DOEE, 2017)
- Flood Risk Management Planning Resources for Washington, DC (NCPC, 2018)
- Flood Emergency Study (DOEE, 2016)
- DC Flood Emergency Manual (USACE, 2015)
- District Response Plan & Hazard Specific Plan – Urban Floods (DC HSEMA, 2015, 2017)
- Flood Resilience in the District of Columbia – Strategies & Legal Authority (Georgetown Climate Center, 2012)
- Watts Branch Flood Risk Mitigation Report (USACE, 2020)
- Blue Green Infrastructure – Cloudburst Management Strategies for the District of Columbia – Report and Workshop (DOEE 2019)
- Mayor’s Task Force on Prevention of Flooding in Bloomingdale and LeDroit Park (Multi-agency, 2012)
- Federal Triangle Stormwater & Drainage Study (Multi-agency, 2011)
- Flood Insurance Study (2010)
- Report on Flooding and Stormwater in Washington, DC (NCPC, 2008)

CONSISTENCY WITH OTHER DISTRICT PLANS

Resilient DC Plan

- Action 2.1.1: “Retrofit all at-risk buildings or remove them from high-risk areas by 2050.”
- Action 2.1.4: “Design climate-ready neighborhoods and developments.”
- Action 2.3.2: “Increase affordability and adoption of flood insurance.”

Sustainable DC Plan

- Action CL2.2: “Improve emergency and community preparedness to respond to climate change events including extreme heat, storms, and flooding, with a focus on the most at-risk populations.”

2021 Updates to the Comprehensive Plan

Environmental Protection Element

- Section 603.3/Policy E.1.1: “...expanding the regulated floodplain areas in Washington, DC beyond the 100-year floodplain...”
- Section 603.10/Policy E-1.1.6: “...prohibit activities within floodplains, waterfronts, and other low-lying areas...that could pose public health or safety hazards in the event of a flood...”

Land Use Element

- Section 305.16/Policy LU-1.2.8: “New waterfront development should actively address flood risk and incorporate adaptive siting and design measures.”

Housing Element

- Section 508.6/Policy H-1.6.2: “Improve the structural resilience of existing housing units that are at risk from natural hazards through the promotion of mitigation techniques, such as building upgrades and elevating electrical or mechanical equipment above designated flood elevations.”

2018 District of Columbia Hazard Mitigation Plan

- “Propose amendments to floodplain regulations and zoning and land use policies to ensure that waterfront setbacks and buffers allow for future sea-level rise, changes in precipitation patterns, sustainable landscaping practices, erosion, and reduce flood risks.”

PROPOSED ACTION TEAMS AND KEY CATEGORIES TO CONSIDER

In order allow for in depth discussion with government and other stakeholder experts, the Task Force will establish subgroups to develop draft action plans and present recommendations to the larger Task Force. It is recommended that there initially be two action teams; Residential Resilience, and Governance & Coordination. Each Action Team will address specific categories as described in the letter from the City Administrator, and outlined below.

Action Team 1 – Residential Resilience

Category 1 – Flood and Sewer Line Backup Insurance

As of October 2020, FEMA data indicates that there are 2,064 flood insurance policies in force in the District of Columbia, including 354 policies that protect properties in the 100-year floodplain. The limited amount of coverage in this high-risk flood zone is likely impacted by the fact that the average yearly premium in this zone is \$2,554. Only one-third of properties in the 100-year floodplain maintain flood insurance coverage in the District. While this rate is higher than the national average, it indicates an opportunity for improving the affordability and increasing the awareness of and adoption of flood insurance to protect vulnerable populations. In addition, Flood Insurance available through the National Flood Insurance Program (NFIP) does not always cover damages that result from sewer line backups. As demonstrated in the September 10th flooding, sewer line back ups are a significant source of water damage to homes in the District.

Action 1.1 Create a Community Insurance Product

In this action, the District would create its own insurance product that would automatically enroll the entire District, or certain neighborhoods, in hazard insurance. A main goal of this action is to help properties that do not know they have flood risk (like the case of many residents on September 10). This product could also be subsidized for low income residents and renters. It would likely funded through a tax, fee, or supplemented budget. A potential vehicle to distribute this insurance could be a private insurance company or a District-operated, or “captive,” insurance enterprise

Action 1.2 Create a Parametric Insurance Product

Under this model an insurance payout is made as soon as a “triggering event” occurs (i.e. when a stream gauge, barometer, or rain sensor reaches a set threshold), rather than being delayed until an adjuster conducts a post-disaster damage assessment. Since the claim

payment is not linked to analysis of damage, policyholders get their money more quickly under this model. This type of product could specifically cover events such as sewer line backups. The ability to rapidly pay the policy holder would be key for this coverage as damaged drywall and flooring needs to be replaced quickly so that mold and other harmful contaminants do not develop in the home.

Action 1.3 Create a Flood Insurance Subsidy

This program would provide means-tested subsidies to low-income residents in the 100-year or 500-year floodplains. Additionally, to incentivize District builders, renovators, and homeowners to construct households and apartment buildings that are resilient to flooding and severe storms, DOEE could work with partners to implement legislation that provides insurance premium discounts for homes that meet certain specifications.

Action 1.4 Join FEMA's Community Rating System

The District could become a participant in FEMA's Community Rating System (CRS) which incentivizes participants to undertake additional floodplain management activities to get a reduction in insurance premiums for all District residents. The District appears as though it could undertake enough additional activities (with increased staff time, possible legislation, and interagency coordination) that would qualify District residents for an approximate 25% discount on NFIP insurance premiums.

Action 1.5 Create Insurance Products Specifically for Sewer Line Backups

The NFIP doesn't always cover damage as a result of sewer line backups. This action would create insurance products to help District residents bounce back quicker from these particular events. This could include a Community Insurance Product where the District covers all residents and pays affected residents after a sewer line backup, or it could include a parametric product that provides payments immediately after a sewer line backup is detected by a monitoring system.

Action 1.6 Insurance Focused Outreach

Unfortunately, many renters and homeowners who are vulnerable to flooding do not have insurance, making them especially vulnerable if disaster hits. Targeted outreach to these communities, including renters who may not realize they are at risk too, is important to increase the numbers of those who are insured.

Category 2 – Repairing Flood Damage in Low-Income Homes and Neighborhoods

After a flood occurs, whether from sewer line back ups or overbank flooding, residents are often displaced from their homes while they await repairs. In cases where affected residents have flood insurance, the cost of those repairs are at least partly covered, though it may take weeks for the repair to be completed due to the claim process and time waiting for contractors. In cases where affected residents do not have flood insurance, the cost to repair flood damage may be prohibitive, especially for low-income homes. The result is that residents stay in a damaged and unsafe home, move elsewhere, or become homeless. This category aims to create a program or programs to help low-income households repair damage after a flood to prevent displacement, unsafe living conditions, or homelessness.

Action 2.1 Create a Program to Fund the Repair of Low-Income Homes After a Flood
The District could create a specific Low-Income Home Repair budget, or implement a development impact fee (such as *Action 6.2 Flood Resilience Fee*) that would be used to fund the repair of flood damage in Low-Income Homes. Alternatively, this action could be coordinated with *Action 1.1 Create a Community Insurance Product* and *Action 1.2 Create a Parametric Insurance Product* so that the insurance products provide the source of funding for low-income home repairs.

Category 3 – Flood Proofing of Individual Homes and Facilities

Research conducted by the National Institute of Building Sciences demonstrates that riverine flood hazard mitigation measures, such as property elevation, mechanical equipment elevation, basement waterproofing, and property acquisition, provide an approximate benefit-cost ratio of six dollars saved in avoided losses for every dollar invested.

Action 3.1 “FloodSmart Homes” Retrofits

The FloodSmart Homes program would be implemented in a similar fashion as the existing RiverSmart Homes stormwater management initiative. The District would provide financial support for property-level mitigation actions including floodproofing, elevation or protection of building systems, pumps, backflow preventers, emergency kits, and water alarms. Low-income residents would be prioritized, and actions would be selected for their ability to both reduce flood risk and lower flood insurance premiums.

Action 3.2 Provide Free Elevation Surveys for Residents in the Floodplain

By conducting elevation surveys of homes in the 100-year floodplain, DOEE might be able to reduce the insurance requirement of homes that are in the floodplain and do not have any opening (i.e. window, door, or vent) below the 100-year flood elevation.

Category 4 – Sewer Line Backups and Backwater Valve Installation

During heavy rain events like those on September 10, the District’s sewer system can be overwhelmed by the large volume of stormwater. When that happens, some stormwater and sewage in a combined sewer system can be forced back up and into basements as the water fills the sewer lines in the street. This is commonly referred to as sewer line backups.

Action 4.1 Expand Backwater Valve / Backflow Preventer Program

Backwater valves are a FEMA-recommended mitigation measure to prevent water in the sewer pipes from “backing up” into homes. These backups can occur during heavy rains that overwhelm the sewer system. The valves help prevent the health hazards and costly cleanup associated with the intrusion of sewage into properties. DC Water has an existing backwater valve rebate program in Bloomingdale and neighborhoods impacted by the September 10th storm. This program could be expanded, and would need additional funding.

Action 4.2 Increase Number of Residents with Sewer Line Backup Insurance

As discussed in Action 1.5, many residents may think their existing homeowners or flood insurance policy covers sewer line backup insurance. This action would coordinate

outreach to residents to inform them that sewer line backup insurance is something they should consider, and could also include the creation of new insurance products for sewerline backups in connection with Action 1.5

Action 4.3 - Code Education

Expand homeowner awareness of the code requirements that drive installation of backwater valves

Action Team 2 - Governance & Coordination

Category 5 – Flood Mitigation Infrastructure Projects

Actions in this category focus on comprehensive, neighborhood scale projects to reduce flood risk. This differs from actions described in Category 3, which focuses on improvements to individual buildings. In many cases, a neighborhood scale infrastructure project will be more cost effective and provide additional benefits to the community.

Action 5.1 Prioritize Capital Projects

In this action, the Task Force, with the help of the DC Silver Jackets, could determine how to prioritize and seek capital funding for flood risk reduction projects (potentially including the ones described below) and create an overview timeline and funding strategy for each.

- Infrastructure identified by the USACE Watts Branch Flood Risk Mitigation Report
- Infrastructure identified by DOEE’s Integrated Flood Model
- Infrastructure identified by DC Drainage Committee
- Buzzard Point Living Shoreline and Levee
- Fort McNair Flood Protection and Trail Infrastructure identified by the DC Office of Planning’s Southwest Resilience Work
- Poplar Point Living Shoreline and Levee
- Infrastructure identified by plans in the DC Office of Planning’s Resilience Areas

Action 5.2 Create More Permanent Design for P Street Levee Closure

The 17th Street Levee Closure is the northern closure of the District’s main levee system. There is also a Southern Closure at P street and 2nd Street SW that requires a sandbag installation during a flood and could potentially be designed to be a more permanent structure.

Category 6 – Regulations, Legislation, Compliance and Permitting

As climate change increases the level of flood risk in the District, regulations must adapt to enhance the resiliency of the built environment. Cities such as Baltimore, MD, Houston, TX, Austin, TX, and Charlotte, NC have responded to flood disasters by expanding the area regulated

for floodplain management. The District aims to take proactive steps to reduce risk before flood losses occur.

Action 6.1 Flood Resilience Legislation

Pass legislation that allows DOEE by rulemaking to regulate the 500-year floodplain and any other additional areas of flood risk not included in the FEMA designated floodplain, and to require flood insurance on any new construction or substantially improved facility.

Action 6.2 Flood Resilience Fee

Any new development or substantial improvement of buildings and structures within flood hazard areas (i.e., 100-year or 500-year floodplains) would be required to pay a floodplain resilience fee. The purpose of the fee would be to offset the costs that such development imposes on the District, including costs to reduce flood risk, especially in the District's most vulnerable communities. The fees will be dedicated to the purposes of flood risk reduction and deposited in a non-lapsing fund that will enable multi-year capital projects and other programs to be planned and implemented.

Action 6.3 Update Flood Hazard Rules and Construction Codes

Updates are proposed to the Flood Hazard Rules, DCMR Title 20, Chapter 31, to better comply with National Flood Insurance Program (NFIP) regulatory standards and to address the District's changing flood risk through climate-informed provisions.

Corresponding Construction Code updates will be necessary to ensure consistency between the Flood Hazard Rules and the Construction Code.

Action 6.4 Expand the Regulatory Floodplain to include Interior Flooding Areas

Right now, DOEE only has regulatory authority over properties that are in FEMA regulated floodplains – which only address riverine and coastal floodplains. The majority of flood damages in September 10 were outside this floodplain. In order to better protect facilities and residents from the dangers of flooding, DOEE would first need to map the areas vulnerable to interior flooding and then include those areas as part of the regulatory floodplain. Regulation of interior flooding areas could be paired with a mitigation program to build infrastructure to reduce flood risk.

Action 6.5 - Code Enforcement and Permitting

Work with District agencies and construction industry (including renovations) to enforce codes such as flood protections, backwater valves, and roof, area drain, and sump pump disconnection requirements when renovating and/or selling a home.

Action 6.6 Begin to Regulate Federal Facilities

Right now, DOEE's floodplain review authority does not extend to federal land (unlike our stormwater review authority). This action would explore legal or other coordination routes that would allow DOEE to have a review role in projects. Without DOEE review, federal facilities may be inappropriately storing hazardous materials in the floodplain and are not subject to DOEE's "No Adverse Impact" requirements that prevent development from increasing flood elevations downstream.

Category 7 – Mapping and Modeling

The District can only build flood risk mitigating infrastructure if it has accurately depicted its flood risk on a map. This category of actions aims to ensure that the District has the most up to date mapping products available that capture all forms of flooding (riverine, coastal, interior) and their expected future risk.

Action 7.1 Add funds to DOEE's Integrated Flood Model Project

This project, expected to start in Fall 2021, will allow the District to create maps and models that show the District's true risk to flooding, including interior flooding and flooding that the District expects in the future. Approximately \$1million was removed from this capital project during FY21 budget adjustments. This funding must be restored to complete the project as scheduled. Additional funding can ensure that floodshed management plans are developed for all flood prone neighborhoods (currently we anticipate only enough funding for four neighborhoods).

Action 7.2 Install Rain Gages and Storm Sewer Monitoring

The addition of rain gages throughout the district and flow monitors in key locations within the District's storm sewer system will help calibrate the Integrated Flood Model and during flood events and help emergency professionals to identify which neighborhoods to respond to first.

Action 7.3 Create a Model Clearing House

Currently, as District Agencies develop their own Hydraulic & Hydrologic (H&H) models, there is no one singular place where the information can be stored. When agencies know that models exist, they can ask for it to be shared by other agencies; however many times agencies are unaware of H&H models that have been done by other groups. This action would create a dedicated platform where all existing and new H&H models would be stored for anyone to use.

Action 7.4 Post Flooding Mapping Protocol

Develop a protocol and interagency agreements on what to do during and after a flood takes place. The protocol will ensure that high water mark photos, gage readings from rainfall or stream gages are collected and stored, and resident surveys are all collected in a singular place that describes the events and outcomes of that particular flood and educate property owners about flood mitigation techniques.

Action 7.5 Update FEMA Floodplain Maps

As a result of updated mapping and modeling from the Integrated Flood Model, DOEE can pursue the update of FEMA's official floodplain maps – either wholesale or area by area in a Letter of Map Revision Process. The goal of these updates would be to more accurately portray the District's risk, and in some cases remove homes from the 100-year or 500-year floodplain that were incorrectly placed there by outdated maps.

Category 8 – Flood Mitigation Planning and Coordination

Managing flood risk in the District is a shared responsibility between multiple agencies. For example, DOEE has an official role as the National Flood Insurance Program coordinator and the Floodplain Administrator, but HSEMA is heavily involved in emergency response during floods, and DC Water’s infrastructure is critical to preventing interior floods. There are many more agencies and roles, which underscores the importance of collaborative governance between District agencies and others in order to reduce our flood risk.

Action 8.1 Designate Attendees for Select District Agencies to the DC Silver Jackets

The Silver Jackets is a group that meets quarterly to discuss flood mitigation projects in the District. Ensuring that all relevant agencies are in attendance will help the District better coordinate our flood related efforts.

Action 8.2 Coordinated Public Outreach

While targeted outreach may be required for stakeholders involved in other action items, general outreach is important to help the public understand that the District is vulnerable to flooding and there are steps that both the District and individual homeowners can take to reduce the risk. This action could identify standard social media messaging before and after a flood, and collaborative events or art installations to bring awareness to flooding.

Action 8.3 Formalize DC Drainage Committee and Designate Members

Multiple District agencies already participate in an informal group known as the DC Drainage Committee. This group, which includes DC Water, DDOT, DCRA, and DOEE work together to handle “drainage” complaints from residents. A primary function of this group is to direct the complaint to the proper agency for resolution. This group and agency members would benefit from formalizing the committee. The committee needs a system to track complaints, locations, follow-up of resolutions, and development of outreach materials to provide residents with answers to frequently asked questions.

Action 8.4 Clarify Maintenance Responsibilities for Flood Infrastructure

Flood infrastructure throughout the District is owned and operated by many different agencies. As an example, the 17th Street Levee Closure, which protects District residents, is owned, operated, and maintained by the National Park Service. The Department of Public Works is responsible for deployment of sand bags at the P ST SW 2nd ST SW Closure. As the District builds more neighborhood scale infrastructure, it will be imperative to identify the agency charged with maintenance of individual infrastructures, and to ensure that agency budgets the necessary operating funds to perform that maintenance.

Category 9 – Flood Emergency Planning, Response and Recovery

Many of the above actions are geared toward taking steps to mitigate risk before a flood. This category recognizes that floods will still happen, and that we need to be efficient and coordinated in our response when they do occur. HSEMA and DC Water are the most likely leaders of actions in this category.

Action 9.1 Develop a visual platform to view real time data

DC Water currently has several platforms that show water/sewer flows across this city, along with pump station and plant capacity. This action would combine those platforms so that DC Water operators could see quickly, in one place, the capacity of the sewer system and where floods might occur. (This action was derived from a DC Water document depicting potential actions following the September 10 flood).

Action 9.2 Implement an early severe weather warning system

Phone alerts, sirens, or warning lights could be used to alert residents that a flood is imminent. The early warning would be based on weather, gage, or sewer system data. (This action was derived from a DC Water document depicting potential actions following the September 10 flood). Any actions around warning systems should integrate with AlertDC.

Action 9.3 Develop an MOU for Emergency Flooding Response

This action would review roles and responsibilities of stormwater flooding within the District and develop coordinated services for better customer experience. It includes deciding on how to staff a storm event (possibly an incident management team such as the DC Snow Team), and development of command center staffing skills to manage and recover from flood events.

Action 9.4 Create a centralized system for flood complaints

Support current efforts by HSEMA and others who are working to create a new type of flood related complaint in the DC 311 system. Ensure that the calls or the resulting actions are forwarded to the correct agency for resolution. This action could be coordinated with Action 7.4 Post Flooding Mapping Protocol and Action 8.3 Formalize DC Drainage Committee and Designate Members.