

**Community Rating System
Activity 510 (Floodplain Management Planning)**

Progress Report on Implementation of Credited Plan

Date this Report was Prepared: October 15, 2021

Name of Community: Baltimore City

Name of Plan: 2018 Baltimore City Disaster Preparedness and Planning Project (DP3)

Date of Adoption of Plan: December 20, 2018

5 Year CRS Expiration Date: December 20, 2023

1. How can a copy of the original plan or area analysis report be obtained:

A copy of the 2018 Disaster Preparedness and Planning Project can be found on the Office of Sustainability website: <https://www.baltimoresustainability.org/plans/disaster-preparedness-plan/>

2. Describe how this progress report was prepared and how it was submitted to the governing body, released to the media, and made available to the public:

This evaluation report was prepared by looking back over the past two years and collaborating with city agencies charged with implementation to evaluate progress that was made. It was submitted to the Baltimore City Council and posted publicly on the Baltimore Office of Sustainability's website.

3. Provide a description of the implementation of each recommendation or action item in the action plan or area analysis report, including a statement on how the project was implemented or not implemented during the previous year:

See Attached

4. Discuss why any objectives were not reached or why implementation is behind schedule:

Staffing shortages, the COVID-19 Pandemic, and limited funding resources have caused delays on some implementation items.

5. What are the recommendations for new projects or revised recommendations?

Chapter 7 of the 2018 DP3 Update details our vision for future revisions of the plan through a series of recommendations. Recommendations include developing resilient design guidelines for historic buildings and districts in flood-prone areas, expanding our resilience hub initiative for vulnerable populations, creating community-specific resilience plans, identifying vulnerable populations through more precise analysis, and integrating food system resilience and man-made hazards into future plan iterations, to name a few.



2021 Status

Disaster Preparedness and Planning Project (DP3)

Baltimore City's All-Hazard Mitigation and Climate Adaptation Plan

Introduction

Baltimore is highly vulnerable to a range of natural hazards, including coastal storms, flooding, extreme heat, and high winds. These types of extreme events are likely to increase in frequency and magnitude over the coming years. These natural hazards, combined with exacerbated influences of climate change, create impacts that will affect the City's residents, businesses, infrastructure, and natural systems, and threaten regionally significant assets.

In 2013, the City of Baltimore developed an integrated All Hazards Mitigation Plan (AHMP) and Climate Adaptation Plan. This Plan, called the Disaster Preparedness and Planning Project (DP3), links research, outreach, and actions to create a comprehensive system for addressing existing and future climate impacts. The DP3 was approved by Planning Commission on October 3, 2013 and has served as the guiding document for all mitigation and resiliency implementation since November 2013. A FEMA-mandated 5-year update of the plan took place in 2018 and the 2018 DP3 Update was approved by FEMA and adopted by the Planning Commission on December 20, 2018. This is the guiding document for 2018-2023, until a 2023 Update is developed and adopted.

The DP3 outlines feasible and effective mitigation and adaptation recommendations for the below hazards, identified as posing the most significant threats for Baltimore:

- Flooding
- Coastal Hazards: Tropical Storms and Hurricanes, Nor'Easter, Sea Level Rise, and Storm Surge & Coastal Inundation
- Precipitation Variability: Precipitation, Winter Storms, Drought, Dam Failure
- Extreme Wind: Associated with Storms, Derechos, Tornadoes
- Extreme Heat and Air Quality
- Additional Hazards: Earthquakes, Lightning and Hail, Tsunamis

For the 2018 DP3 Update, a 50+ person Advisory Committee consisting of City and State agencies, community organizations, and citizens was developed to provide input and oversight during the plan update process. The 2018 DP3 Update includes the latest science and most recent climate impacts, along with an updated set of mitigation/adaptation strategies and actions. Completely new Hazard and Vulnerability Assessments were performed for the 2018 Update by

an experienced consultant team. The 2018 DP3 Update also includes community perspectives on hazard risk.

An Equity and Outreach Sub-Committee was formed to conduct community engagement work with an equity frame to inform the update. Outreach largely took place via the creation and dissemination of a community survey focused on collecting community perspectives on risk to solicit valuable community feedback, enhance empirical aspects of the hazard and vulnerability analyses, and inform future plan iterations. The survey included questions regarding perception of risk to both natural hazards-such as flooding and other coastal hazards, and manmade hazards. Significant effort was made to gain feedback from a representative sample of Baltimore's demographic composition, with particular focus on those residents most vulnerable to natural hazards.

A Strategy Sub-Committee was also formed to make thorough revisions to the original 2013 strategies and actions. The Strategy Sub-Committee consisted of agencies responsible for carrying out the strategies and actions listed in the plan. After reviewing risks and vulnerabilities associated with natural hazards in Baltimore, the Strategy Sub-Committee developed an updated comprehensive list of strategies and actions to ensure the City's continued ability to adapt to and mitigate the potential impacts of hazards. The Committee re-prioritized the strategies and actions, reassessed implementation timeframes, developed new actions that reflected results from the hazard and vulnerability assessments and new city or agency priorities/capacities, assessed performance metrics, and provided updates on implementation progress.

New actions added to the list are reflective of progress within the city and continued commitment to the implementation of hazard mitigation projects. They are as follows:

- Pursue grants to acquire flood-prone properties, when and where feasible
- Pursue grants to elevate flood-prone properties, when and where feasible
- Pursue grants and technical assistance to conduct hydrology and hydraulic studies on flood-prone areas within the City, to include Maidens Choice Branch, when and where feasible
- Evaluate potential for completion of Maidens Choice stream restoration project (U.S. Army Corps of Engineers, Baltimore District identified project)
- Pursue grants for flood control measures to alleviate flooding in the most flood-prone areas when and where feasible
- Pursue grants for floodplain storage and diversion projects to alleviate flooding in the most flood-prone areas, when and where feasible
- Pursue grants for dry floodproofing of commercial and historic structures in the most flood-prone areas, when and where feasible
- Develop training and guidance documents for Resiliency Hub leaders that detail the scope of services (include checklist and instructions for opening, running, and closing)
- Increase the number of Resiliency Hubs
- Initiate community resiliency planning, outreach, and support
- Increase the amount of land permanently secured for food production, from community gardens and market gardens to commercial urban agriculture
- Implement the Plan for Food Access During Incidents and Disasters
- Increase food system resilience over the long term

- When and where feasible, pursue grants to complete any project eligible under FEMA's Hazard Mitigation Unified Guidance and its addendum that will contribute to the reduction of hazardous conditions in the City

The comprehensive list of strategies and actions along with progress updates can be found in the attached appendix (Appendix A). Progress is noted specifically under the 'Status' column. Even though many strategies and actions have been changed, the progress made over the last year on the previous set are embedded in this set. Though many actions were combined, reworded, and added, no actions were deleted.

Other DP3 Plan Updates of note:

As part of the 2018 DP3 Update, 51 actions were consolidated into 23 new actions that combine descriptions of the actions. Adjustments and modifications to actions through consolidation resulted in renumbering and reclassification of actions and strategies.

Another part of the update involved the reprioritization of strategies and actions. The priority scores were adjusted to exclude values for 'Climate Action Plan overlap'. These adjustments resulted in a reduction in the number of low-priority actions and an increase in the number of medium- and high-priority actions for the 2018 plan. Priority scoring otherwise used the same measures (financial feasibility, political feasibility, impact, and public support, with individual values ranging from a low rating of '1' to a high rating of '3') as in the 2013 plan. The rating scale was adjusted accordingly, and subsequently, the new aggregate ratings are 5 to 7 for low priority, 8 to 9 for medium priority, and 10 to 12 for high priority.

The results of the HIRA were introduced as an additional ranking factor, producing a list of priority actions for the 2018 DP3 Update. This analysis identified 87 actions that were classified as first, second, or third priority. First-priority actions were defined as having existing high-priority scores and supporting "all hazards;" second-priority actions were defined as having high-priority scores and supporting "2 or more hazards;" third-priority actions were defined as having actions that addressed "2 or more hazards" only. New actions were also defined as first priority. The 2018 DP3 Update also includes a whole chapter that discusses future actions the City plans to take to continue updating and implementing the plan moving forward.

The 2018 DP3 Update went out for public comment in August 2018 and a public meeting was held two weeks later. After incorporating comments, the 2018 DP3 Update was submitted to Maryland Emergency Management Agency (MEMA) and FEMA in September 2018 and was formally adopted on December 20, 2018. The 2018 DP3 Update includes information on our implementation progress as well as our community engagement process. It was also sent to our governing board, the local media, and the State NFIP Coordinator.

Since the 2018 adoption, significant progress has been made toward achieving the Plan recommendations.

Status of the DP3 Action Items:

As mentioned, the comprehensive list of strategies and actions along with progress updates can be found in the attached appendix (Appendix A). Progress is noted specifically under the ‘Status’ column.

In the past year, Baltimore City has made on progress on several recommendations and actions and continued previously reported work on others. Highlights of the past year include:

- Forming a Sustainability and Resiliency Subcabinet under the Mayor’s Office to accelerate implementation of priority sustainability and resiliency action items and developing a Subcabinet Working Group specifically dedicated to addressing Flooding and Infrastructure
- Advancing efforts to improve green building codes and increase access to safe, affordable, and energy-efficient housing options
- Completing and adopting the 2020 Nuisance Flood Plan to map, track and catalog nuisance flooding that happens in the city from 2020 until 2025
- Strengthening and updating the Forest Conservation, Critical Area Management Program, and Floodplain Management Program codes
- Deploying sandbag distribution events near multiple flood-prone sites in advance of potential heavy precipitation events/seasons
- Securing a \$32 million FEMA BRIC program award for the Middle Branch Resiliency Initiative to support a large-scale coastal restoration and redevelopment project incorporating green infrastructure and coastal flood mitigation strategies
- Continuing and improving community preparedness outreach in concert with the Office of Emergency Management (OEM)
- Further identifying, collaborating with, and supporting neighborhoods with high flood-risk to implement flood resiliency strategies
- Incorporating sustainability and resilience criteria into the Capital Improvement Program process
- Growing the Baltimore City Community Resiliency Hub Program from 9 to 15 organizations, securing funding to increase solar power and battery storage system installations for Hub buildings, and hosting monthly meetings with Resiliency Hub Leaders to share resources and information about flooding, extreme heat, COVID-19 testing and vaccination, etc. Four Hub buildings now have fully functional solar power and battery back-up installations
- Securing funding for the update of the city’s Climate Action Plan, conducting a 2017 GHG emissions inventory, and commencing the 2020 GHG emissions inventory
- Securing funding to support the FEMA-required 2023 DP3 Update
- Supporting the implementation of a comprehensive Emergency Food Strategy throughout the COVID-19 Pandemic

In general, three factors limited progress in the past year: The ongoing COVID-19 Pandemic, availability of funding, staffing levels at the Office of Sustainability.

A full list of the DP3 actions and the current implementation status is included in Appendix A. Some of the specific work completed and milestones reached in the past year are summarized below:

IN 9: “Encourage development of Green Streets in flood prone areas and throughout the City”

- A Complete Streets Manual was adopted by the city in 2020 to encourage safer, greener streets for pedestrians, cyclists and other transportation modalities.
- A number of bioretention/bumpout projects were identified as part of the MS4 Permit project implementation.
- There have continued to be new development projects using Green Streets techniques

IN 12: “Enhance and strengthen waterfront zoning and permitting”

- The Critical Area Management Program and Floodplain Management Program codes were both updated over the last year
- A Baltimore City Nuisance Flood Plan was developed to better track, understand, and manage nuisance flooding along the waterfront in the city
- The encouragement of integrated flood protection systems that use structural (engineering) and non-structural (wetlands) measures is ongoing. Two examples include the Middle Branch Plan and Frederick Avenue Stormwater Mitigation efforts
- The review and enhancement of coastal area design guidelines to better mitigate the impacts of flooding is ongoing. The CAMP Manual 2020 update prevents new bulkheads from being built, for example.
- The enhancement and strengthening of waterfront zoning and permitting is ongoing. The Department of Planning is working on a revision of Article 7 Natural Resources Code Division I (floodplain requirements). The revision will include waterfront areas that are located within the regulatory floodplain.

IN16: “Implement the requirements of Baltimore's MS4 (separate stormwater and sewer system) permit” and “Preserve and protect natural drainage corridors”

- The work to develop projects under the new MS4 permit is progressing, and numerous stream restoration projects are being constructed or will be constructed soon. In addition, the Green Network Plan identifies stream corridors as Nature Corridors for protection and enhancement.
- The Office of Emergency Management (OEM), along with other city agencies, are pursuing grants for mitigation in various flood-prone areas in the City.

IN 17: “Support existing stormwater requirements and continue to evaluate and improve Best Management Practices” and “Utilize water conservation elements such as green roofs, rain gardens, cisterns, and bioswales on residential, commercial, industrial, and City-owned properties to capture stormwater”

- MS4 Permit Implementation and 21st Century School projects are increasing the use of these techniques on City-owned properties.

- Critical Area code has a 10% nutrient reduction requirement for stormwater management, and developers typically met that through the practices listed within the DP3.

IN 19: “Encourage information sharing within the Chesapeake Bay community to assist in developing best management practices”

- Baltimore continues to participate in the Baltimore Urban Waters and Baltimore Wilderness groups, which promote information sharing among jurisdictions.

IN 20: “Expand and integrate existing programs to reduce or intercept debris before it gets into the streams and harbor”

- Four trash wheels have been implemented, with one additional added in 2021 at the mouth of the Gwynns Falls.

IN 21: “Incorporate consideration of hazards and climate adaptation efforts into all plans, systems, operations, and maintenance.”

- A Sustainability and Resiliency Subcabinet was established under the Mayor’s Office in 2021 to accelerate implementation of priority sustainability, adaptation, and resiliency action items across government.
- A Flooding and Infrastructure Subcabinet Working Group was created to specifically address flooding and infrastructure issues.
- A Climate Planning Subcabinet Working Group was created to specifically integrate hazards and climate adaptation efforts into planning processes
- In the development of the 2020 Less Waste, Better Baltimore Plan, hazard planning was integrated so as to suggest increased capacity for the landfill in case of disaster

BL 3: “Utilize open space category in zoning code to protect sensitive areas (e.g. stormwater sites, steep slopes, foodways, etc.)”

- Regarding the protection of stormwater management (SWM) facilities, Article 7 Natural Resources Code requires that SWM facilities sites be placed under conservation easements or similar instrument to protect the areas from being redeveloped.
- The Zoning Code section that addresses the Critical Area Management Program requires that open space where mitigation plantings have been installed must be placed under a conservation easement or similar legal instrument to preserve the area in perpetuity

BL3: “Review and amend existing building and floodplain regulations to require more flood resistant new and existing structures when located in the floodplain

- The Baltimore City Building, Fire, and Related codes have been updated in 2021 and include the latest updates to the Article 7 Natural Resources Code (floodplain requirements).

NS 1: “Evaluate green corridors and parks for possible improvements for floodplain management”

- As part of the Green Network Plan, Nature Corridors and Nature Nodes were identified along streams and in floodplain areas for potential to improve floodplain management.
- The evaluation of green corridors and parks for possible improvements for floodplain management is ongoing. Many stream restoration projects by DPW are happening in Parks as a co-benefit to the MS4 permit requirements, but more could still be done to a better extent specifically for floodplain management.

NS 3: “Convert vacant land and row houses into meaningful and connected open space” and “Certify Baltimore as a Community Wildlife Habitat through the National Wildlife Foundation”

- The utilization of the Baltimore Green Network Plan to increase green spaces in areas where there is available vacant land to reduce the heat island effect and provide other benefits is ongoing. Both Racheal Wilson and Cab Calloway parks are well underway in 2021.
- The conversion of vacant land and row houses into meaningful and connected open space is ongoing.
- The creation of a strategic plan that identifies areas of focus for tree planting, stormwater management, and forest preservation has not been started, as yet. However, Green Network does this to some extent and the MS4 identifies some priorities but needs to be coordinated with the Sustainability Plan. This collaborative, interagency effort needs to be initiated.
- Baltimore became a certified Community Wildlife Habitat in 2018

PS 3: “Designate community leaders and organizations that can assist and provide support during hazard events”

- The initiation of community resiliency planning, outreach, and support is ongoing. A grant from the Pew Charitable Trusts from 2018-2020 enabled us to hire consultants and build out our community resiliency planning outreach and support, particularly of Resiliency Hubs, by hosting a scenario-based table-top training workshop in October 2019. Crisis/hazard support for communities and community organizations has been ongoing throughout the pandemic.
- As part of the effort to increase City’s ability to respond to physical, social, and economic challenges, Baltimore City is partnering with frontline community organizations to become Community Resiliency Hubs in some of our more climate-vulnerable communities. The Community Resiliency Hub Program is an innovative and impactful community-centered initiative that increases community capacity to prepare for, withstand, and respond to natural hazard impacts and emergency situations. The goal of this program is to better connect frontline community organizations with focused support and resources so that, in the event of a natural disaster or emergency, there is improved provision of emergency response and recovery services to under-resourced neighborhoods and their most vulnerable residents. The Program is a partnership between service-based community organizations in Baltimore’s most climate-vulnerable neighborhoods and the Office of Sustainability (BoS), Office of Emergency Management (OEM), and Department of Health (BCHD). The Office of Sustainability is the lead agency that is responsible for growing and managing the Program as a key strategy of

Baltimore's Disaster Preparedness Plan (DP3). In addition to providing backup supplies and resources, Hubs will also serve as locations for incorporating energy efficiency, weatherization, solar installation and battery backup systems – all of which help reduce GHG emissions and meet goals identified in the City's Sustainability, Climate Action, and Disaster Preparedness Plans.

Accomplishments to Date

- 15 community resiliency hub partner organizations in the program
- 4 community resiliency hub partner organizations are fully outfitted with solar and battery storage systems with 3 more slated to receive installations within the next 1-2 years
- Purchases of supplies – ongoing
- Monthly meetings throughout the ongoing COVID-19 pandemic to provide risk awareness education, preparedness information, and peer-to-peer learning opportunities.
- Preparedness training on basic disaster response skills
- Conversations with partners, especially about best practices for acting as a Hub – ongoing
- Communication resources (e.g., banners and flyers)
- Formalization of Resiliency Hub status through MOU

PS 8 and PS 9: “Conduct climate, resiliency, and emergency planning education and outreach” and “Improve awareness and education about the importance of flood insurance and preparation for Baltimore citizens”

- The Baltimore Office of Sustainability's Floodplain Management Program has been conducting outreach as a public service to educate residents about local flood hazards and flood preparedness. We have on-going partnerships with local housing organizations that allow us to engage prospective homeowners. We inform prospective home buyers about the mandatory insurance requirements, then educate them on how to determine their flood risks using local mapping tools. We're also partnering with the Mayor's Office of Emergency Management and the Department of Health distributing hazard preparedness literature in communities located in the Special Flood Hazard Area (SFHA). Mailers describing flood risk, various ways to prepare for a flood, and how to contact the City for assistance have also been sent to every property in the SFHA. Additional mailers were sent to properties in repetitive loss areas.
- The Baltimore City Department of Planning and the Office of Emergency Management, in coordination with the Maryland Emergency Management Agency, the Maryland Department of the Environment and the Maryland Insurance Agency held two online and citywide outreach events in 2020 to educate Baltimore's residents regarding emergency awareness and preparedness, flood protection and flood insurance. The events included:
 - B'more Prepared for Urban Flooding held on 10/22/2020
 - Are You Ready?? Disaster Preparedness Event held on 9/16/2020

Capital Improvements Process

The City of Baltimore has incorporated resiliency into the capital improvements process. The guidelines and training for the program calls out example recommendations where capital projects are needed to achieve the goals of the DP3 (see box). In addition, agency staff are invited to meet with the City's Climate and Resilience Planner to discuss their projects and identify how they can address current and future hazard conditions.

EXCERPT: GUIDELINES FOR THE CAPITAL IMPROVEMENT PROJECT REQUEST PROCESS FY 2019 – 2024

Disaster Preparedness and Resiliency: In order for Baltimore to succeed in reducing risk and vulnerability and becoming a more resilient city, the strategies and actions of the [Disaster Preparedness Project and Plan \(DP3\)](#) must be considered and integrated into the CIP. Each department has a responsibility to consider how their projects will address future climate impacts, reduce risk, and make Baltimore more resilient. Projects must integrate consideration for increased precipitation events including heavier precipitation in shorter durations of time; higher heat including weeks of 90+ degree temperatures; stronger storms including hurricanes and strong winds; and rising sea levels which will lead to increased tidal flooding and storm surge. Sample recommendations from the plan that impact capital projects include:

- IN-7, A4- Design bridges expansion joints for longer periods of high heat and heavy precipitation events, and develop a more robust inspection and maintenance process
- IN-9, A1- Prioritize infrastructure upgrades for roads identified at risk of flooding through the use of elevation data and Sea, Lake and Overland Surges from Hurricanes (SLOSH) model results
- IN-1, A7- Install external generator hookups for critical facilities that depend on mobile generators for backup power
- BL-8, A1- Install energy-efficient and low-water-use equipment during renovations in all City-owned buildings
- IN-15, A1- Replace old and malfunctioning pipes with new pipes or retrofit existing pipes with new lining prioritizing areas with reoccurring flooding
- IN-16, A3- Install backflow-prevention devices or other appropriate technology along waterfront to reduce flood risk

Priority Work for 2022

The formation of the Sustainability and Resiliency Sub-Cabinet, including the Flooding and Infrastructure Working Group, brings a great opportunity to elevate the DP3 and other plans, strategically discuss important flood mitigation strategies across city agencies, and accelerate implementation throughout the city. We intend to also focus on continued implementation of high priority actions identified in the DP3 and pave the way for new strategies, actions, and priorities to be incorporated into the 2023 DP3 Update.

Materials and Outreach

Disaster preparedness materials and floodplain materials are available and maintained at City permitting centers including the Abell Wolman building and Benton building. Additionally, materials are available 24 hours a day at the Office of Sustainability website.

Information Documents Provided Year-Round:

FEMA and NFIP Flood Insurance Brochures:

- | | |
|---|--------------|
| 1. Why You Need Flood Insurance | FEMA F-683 |
| 2. Por Que Usted Necesita Seguro De Inundacion | FEMA F-683S |
| 3. Flood Preparation and Safety | FEMA F-684 |
| 4. Top Ten Facts for Consumers | FEMA F-301 |
| 5. FloodSmart.gov Know Your Risk | NFIP |
| 6. FloodSmart.gov Conozca su Riesgo | NFIP Spanish |
| 7. How the NFIP Works | FEMA F-025 |
| 8. Answers to Questions About the NFIP | FEMA F-084 |
| 9. Flood Insurance Claims Handbook | FEMA F-687 |
| 10. Manual de Reclamacion para Seguros
Contra Inundaciones | FEMA F-687S |
| 11. NFIP Summary of Coverage | FEMA F-679 |
| 12. FEMA Prepare for Emergencies Now | FEMA R-6 |
| 13. FEMA Preparing Makes Sense for Older | FEMA R-5 |
| 14. FEMA Emergency Supply List | FEMA R-8 |
| 15. FEMA What is Risk Map | |

Other Brochures:

- | | |
|--|---------------------|
| 16. Americas Preparation for Community Based Organizations | |
| 17. Maryland Natural Hazards Preparedness Guide | |
| 18. Quick Series Tsunami Preparedness | NOAA and MEMA |
| 19. What is Freeboard? Raise your home,
lower your payments MD DNR CoastSmart | |
| 20. CoastSmart Recovery | MD DNR CoastSmart |
| 21. Family First- Buddy Says “Be Ready”
Corps | MEMA and MD Citizen |

City Brochures:

- 22. About Mandatory Flood Insurance (1 pager) -- Distributed by the Department of Planning
- 23. B’more Prepared Plan 9: A Simple Guide to the nine essential items to help you shelter-in-place in the event of an emergency -- Distributed by the Baltimore City Health Department
- 24. Baltimore Health Information Card: Follow your emergency plan and instructions -- Distributed by the Baltimore City Health Department, the Department of Planning and the Mayor’s Office of Emergency Management

Websites:

- City of Baltimore Main Website
<http://www.baltimorecity.gov/answers/sustainability-resiliency-floodplain>
- City of Baltimore, Office of Sustainability
www.baltimoresustainability.org/floodplain
- City of Baltimore, Department of Planning
www.archive.baltimorecity.gov/Government/AgenciesDepartments/Planning.aspx
- City of Baltimore, Office of Emergency Management
<http://emergency.baltimorecity.gov/PublicInformation/DisasterReliefInformation.aspx>
<http://emergency.baltimorecity.gov/PublicInformation/Resources.aspx>
- City of Baltimore, Health Department
<http://health.baltimorecity.gov/programs/emergency-preparedness-response>
- Enoch Pratt Library Floodplain Page
www.prattlibrary.org/research/tools/index.aspx?cat=19952&id=84511
- Inundation Zone Maps
<http://cityview.baltimorecity.gov/maps/map.html?webmap=a43dd492035746ccb6887abde9b5419b>
- Evacuation Routes and Shelters
<http://cityview.baltimorecity.gov/maps/map.html?webmap=ba0afd2d413840198e934655eccece82>

Appendix A: Status Updates for All Mitigation Strategies and Actions

Strategies and Actions found in Chapter 5 define the programs, policies and projects that the city will undertake to accomplish its mitigation goals.

Roadmap to Reading

Each Strategy has a lead agency and each Action also has a lead agency.

Stakeholders are identified for each action and an estimated timeframe for completion is also identified.

Priority Scores that were carried over from 2013

2018 Plan Update
Priority Actions - based on 2013 scores plus HIRA

Strategies are divided into 4 sectors and identified by letters and numbers in green bars. The first letter(s) refer to the sector Area (IN, B, NS or PS). The numbers refer to the strategy order

Infrastructure IN (gray)

Buildings B (blue)

Natural Systems NS (green)

Public Services PS (purple)

STRATEGY	ACTION	ACTION	ACTION LEAD AGENCY	STAKEHOLDERS	HAZARD	ESTIMATED TIMEFRAME (short 1-2yrs, med 3-5yrs, long 6+)	STATUS	Priority Score (left CAP Overlap Values)	2018 DP3 UPDATE PRIORITIZATION
								Low 5.0-7.0	
								Med 8.0-9.0	
								High 10.0-12.0	FIRST: High Priority/ "All" Hazards SECOND: High Priority/ 2 or more Hazards THIRD: 2 or more Hazards
IN-1: Protect and enhance the resiliency and redundancy of electricity system (Lead Agency: MOEM)									
IN-3	7	Conduct an in-depth analysis of the impacts of drain fields that feed the harbor	DPW	Antrak, BCRP, CSX, Developers, DOT, DPW, FHV/A, MDTA, MON, NGOs	Flooding Coastal Hazards Precipitation Variability	Medium-Long	*Currently in very early stages	8	
B-2: Enhance City building codes that regulate building within a floodplain or near the waterfront (Lead Agency: DOP)									
B-2	4	Incorporate outfall diversion regulations	DOP / DPW	Baltimore County, BDW, DHCD, MDE	Flooding Coastal Hazards	Short-Medium	*Currently in very early stages	8	
NS-2: Increase and enhance the resiliency and health of Baltimore's urban forest. (Lead Agency: BCRP, Forestry)									
NS-2	1	Anticipate the impacts of future changes in temperature and weather on the urban forest by developing a comprehensive list of plant and tree species known to have a broad range of environmental tolerances		Rec & Parks	Flooding Precipitation Variability	Short	* Currently in advanced stages. Changing temperature will impact native species.	11	
PS-1: Strengthen emergency preparedness coordination between local government, NGOs, and private entities by updates to the City Emergency Operations Plan (EOP) and related Emergency Support Functions (ESF) (Lead Agency: MOEM)									
PS-1	1	Identify and develop a common database and communications technology that all city government agencies and departments should utilize for hazard information, preparedness and response	MOEM	MOE, DOT, BCRP, County Governments, DOP, DHMM, MOIT, PSC	All	Short	* Currently in early stages. Currently maintain watch lists for communications during emergencies. We are implementing the new Code Red mass notification system which all city agencies will have access to. We are participating in the cities open data committee.	11	
STATE ACTION IN-3	11	STATE ACTION - Upgrade existing floodgate hardware and mechanisms to control rise rate of water into all city tunnels	CSX, Antrak, MTA, FHV/A	Antrak, BCRP, CSX, Developers, DOT, DPW, FHV/A, MON, NGOs, MTA	Flooding Coastal Hazards Precipitation Variability	Long	*Still Pending	5	

Actions are identified within each related strategy and target specific steps that the city can take to implement each measure.

State, Federal or Non-Government agency actions are identified in dark gray

2018 HIRA results - Hazards that are associated with mitigation action

Agency Acronyms

- BARCS: Baltimore Animal Rescue and Care Shelter, Inc.
- BCFD: Baltimore City Fire Department
- BCHD: Baltimore City Health Department
- BCPD: Baltimore City Police Department
- BCPSS: Baltimore City Public School System
- BCRP: Baltimore City Department of Recreation and Parks
- BDC: Baltimore Development Corporation
- BDW: Baltimore Development Workgroup
- BGE: Baltimore Gas and Electric
- CDC: Centers for Disease Control and Prevention
- CGRN: Community Greening Resource Network, a support program of P&P
- CHAP: Commission for Historic and Architectural Preservation
- CoS: Commission on Sustainability
- CSX: CSX Corporation
- DES: Department of Environmental Services
- DGS: Department of General Services
- DHCD: Department of Housing and Community Development
- MDH: Maryland Department of Health
- DOIT: Department of Information Technology
- DOP: Department of Planning
- DOT: Department of Transportation
- DPW: Department of Public Works
- FEMA: Federal Emergency Management Agency
- FHWA: Federal Highway Administration
- MCC: Maryland Conservation Corps
- MDA: Maryland Department of Agriculture
- MDE: Maryland Department of the Environment
- MDNR: Maryland Department of Natural Resources
- MDTA: Maryland Transportation Authority
- MEMA: Maryland Emergency Management Agency
- MOEM: Mayor's Office of Emergency Management

- MON: Mayor's Office of Neighborhoods
- MOIT: Mayor's Office of Information Technology
- MTA: Maryland Transit Administration
- NAHB: National Association of Home Builders
- NGO: Non-governmental Organization
- OEM: Office of Emergency Management
- P&P: Parks and People
- PSC: Public Service Commission
- SHA: Maryland State Highway Administration
- USACE: U.S. Army Corps of Engineers

Appendix 5-1: All Strategies and Actions by Category

STRATEGY #	ACTION #	ACTION	ACTION LEAD AGENCY	STAKEHOLDERS	HAZARD	ESTIMATED TIMEFRAME (short 1-2yrs, med 3-5yrs, long 6+)	FINANCING OPTIONS	STATUS	Priority Score (w/o CAP Overlap Values)		2018 DP3 UPDATE PRIORITIZATION		
									Priority	Score			
									Low	5.0-7.0			
									Med	8.0-9.0			
									High	10.0-12.0	FIRST: High Priority/ "All" Hazards	SECOND: High Priority/ 2 or more Hazards	THIRD: 2 or more Hazards
IN -1 Protect and enhance the resiliency and redundancy of electricity system (Lead Agency: MOEM)													
IN- 1	1	Work with the Maryland Public Service Commission (PSC) to minimize power outages from the local electric utility during extreme weather events by identifying and protecting critical energy facilities and located within the City	PSC	BCRP (Forestry), BGE, Building Owners, DGS, DOT, DPW, Exelon, PSC, Utility customers, Veolia, Wheelabrator	All	Short	• Baltimore City CIP • Federal Sources • BGE's existing funds allocated through the Smart Grid Investment Grant	*Currently in very early stages	12				
IN- 1	2	Evaluate the City of Baltimore utility distribution system, and identify “underground utility districts” using BGE’s May 2013 short term reliability improvement plan	PSC / DPW	BCRP (Forestry), BGE, Building Owners, DGS, DOT, DPW, Exelon, PSC, Utility customers, Veolia, Wheelabrator	All	Short	• Baltimore City CIP • Federal Sources • BGE's existing funds allocated through the Smart Grid Investment Grant	*Currently in very early stages	10				
IN- 1	3	Support BGE’s collaboration with the Maryland Public Service Commission to implement various smart grid solutions that will provide the City with real-time access to data during events	DPW	BCRP (Forestry), BGE, Building Owners, DGS, DOT, DPW, Exelon, PSC, Utility customers, Veolia, Wheelabrator	All	Short	• Baltimore City CIP • Federal Sources • BGE's existing funds allocated through the Smart Grid Investment Grant	*Currently in very early stages	8				
IN- 1	4	Identify, harden, and water seal critical infrastructure relative to pump stations, treatment plants, electrical, heating, and ventilation facilities within the flood plain	DPW	BGE, DGS, DPW, Exelon, PSC, MEO, MOEM Veolia, Wheelabrator	Flooding Coastal Hazards Precipitation Variability	Medium	• Baltimore City CIP • Federal Sources • BGE's existing funds allocated through the Smart Grid Investment Grant	*Currently in very early stages	6				
IN- 1	5	Work with stakeholders to encourage facility owners to develop decentralized power generation and fuel flexibility capabilities	MOEM	BCRP (Forestry), BGE, Building Owners, DGS, DOT, DPW, Exelon, PSC, Utility customers, Veolia, Wheelabrator	All	Medium	• Baltimore City CIP • Federal Sources • BGE’s existing funds allocated through the Smart Grid Investment Grant	*Currently in very early stages. MOEM scheduling meeting to develop a strategy for outreach.	8				
IN- 1	6	Develop a comprehensive maintenance and training program for City employees at facilities with backup generators to ensure proper placement, hook-up and function during hazard events.	DGS	BCRP (Forestry), BGE, Building Owners, DGS, DOT, DPW, Exelon, PSC, Utility customers, Veolia, Wheelabrator	All	Short-Medium	• Baltimore City CIP • Federal Sources • BGE's existing funds allocated through the Smart Grid Investment Grant	*Still Pending	7				
IN- 1	7	Install external generator hookups for critical City facilities that depend on mobile generators for backup power	DGS	MOEM, BCRP (Forestry), BGE, Building Owners, DGS, DOT, DPW, Exelon, PSC, Utility customers, Veolia, Wheelabrator	All	Short-Medium	• Baltimore City CIP • Federal Sources • BGE's existing funds allocated through the Smart Grid Investment Grant	*Still Pending MOEM will assist DGS in perusing mitigation grants when available to support this activity. New schools are required to have backup generators or hook ups.	8				
IN- 1	8	Partner with utility to evaluate protecting power and utility lines from all hazards.	MOEM	BCRP (Forestry), BGE, Building Owners, DGS, DOT, DPW, Exelon, PSC, Utility customers, Veolia, Wheelabrator	All	Ongoing. As hazards change may have to adapt our strategy for protection.	• Baltimore City CIP • Federal Sources • BGE's existing funds allocated through the Smart Grid Investment Grant	*Currently in early stages. Currently coordinated by MOEM Director through the BGE Citizen Advisory Committee	10				
IN- 1	9	Determine low-laying substation vulnerability and outline options for adaptation and mitigation.	PSC / DPW / MOEM	BCRP (Forestry), BGE, Building Owners, DGS, DOT, DPW, Exelon, PSC, Veolia, Wheelabrator	Flooding Coastal Hazards Precipitation Variability	Short	• Baltimore City CIP • Federal Sources • BGE's existing funds allocated through the Smart Grid Investment Grant	*Currently in early stages	9				
IN-2: Increase energy conservation efforts (Lead Agency: BoS)													
IN- 2	1	Increase energy efficiency across all sectors through education, efficiency retrofits, and building management systems	MEO	BGE, Building owners, City Delegates, DOP, DPW, Energy Office, PSC	All	Medium	• MEA	*Implemented/ongoing	12				
IN- 2	2	Encourage critical facilities and institutions to connect to existing cogeneration systems, or develop new cogeneration systems	MEO	DOP,BGE, Building owners, DOP, DPW, Energy Office, PSC	All	Medium	• Federal Emergency Grant Funds • Local Funds	*Currently in very early stages	9				
IN- 2	3	Continue the City’s electricity demand-response program during peak usage or pre-blackout periods	BGE	BGE, Building owners, City Delegates, DOP, DPW, Energy Office, PSC	All	Medium	• BGE • Federal Funds	*Implemented/ongoing	7				
IN 3: Ensure backup power generation for critical facilities and identified key infrastructure during power outages (Lead Agency: MEO)													
IN- 3	1	Investigate off-grid, on-site renewable energy systems, generators, and technologies for critical facilities to ensure redundancy of energy systems	DGS	BGE, DGS, MDH, DOP, DOT, DPW, MOEM	All	Medium	• Baltimore City CIP • Federal Programs	*Currently in mid-stages	7				
IN- 3	2	Seek funding to purchase and install generators for all city building designated as critical to agency functions	DGS	DGS, DOP, DOT, DPW, MOEM	All	Short	• Federal Grants • State Grants	*Currently in very early stages	8				
STATE ACTION IN-3	4	STATE ACTION - Evaluate and ensure backup power generation is available to healthcare facilities (nursing homes, critical care facilities, hospitals, etc.)	MDH	DGS, DOP, DOT, DPW, MOEM	All	Medium	• Hospital Budgets • Federal Emergency Funds	*Currently in very early stages	9				
IN-4: Protect and manage compressed liquefied natural gas sites and (city) fueling stations before and during hazard events (Lead Agency: MOEM)													

STRATEGY #	ACTION #	ACTION	ACTION LEAD AGENCY	STAKEHOLDERS	HAZARD	ESTIMATED TIMEFRAME (short 1-2yrs, med 3-5yrs, long 6+)	FINANCING OPTIONS	STATUS	Priority Score (w/o CAP Overlap Values)		2018 DP3 UPDATE PRIORITIZATION		
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IN- 4	1	Work with BGE to ensure existing preparedness plans for Spring Gardens liquefied natural gas site incorporate its vulnerability to present and predicted flooding, storm surge and sea level rise	BGE	BGE, DGS, DOP, DOT, DPW, Veolia	All	Medium	BGE	*Currently in very early stages	8				
IN- 4	2	Adopt building code that requires anchoring of 50 gallon storage tanks or larger	DOP / HCD	MDE,BGE, DGS, DOP, DOT, DPW, Veolia	All	Medium		In flood hazard areas, tanks must be installed at or above the elevation required by the Floodplain Management Code (Natural Resources Code - Article 7) or as otherwise allowed by the Floodplain Management Code.	8				
IN- 4	3	Support the Maryland Public Service Commission's effort to accelerate replacement of aging natural gas infrastructure which will harden the system against flooding	BGE	BGE, DGS, DOP, DOT, DPW, Veolia	All	Medium	BGE	*Still Pending	8				
IN-5: Evaluate and improve resiliency of liquid fuels infrastructure (Lead Agency: MOEM)													
IN-5	1	Design and implement a generator program that assists private gas stations in securing backup generators, especially those stations along major evacuation routes. Exchange for a commitment to fueling emergency response vehicles during a hazard event	MOEM	BCFD, BCPD, DES, DOT, DPW, MOE	All	Medium	<ul style="list-style-type: none">Fuel Up MarylandFederal Sources	* Still pending. Due to staffing shortages action not begun; however, plans in place to develop a committee to work with stakeholders on this issue.	8				
IN-5	2	Increase and ensure fuel availability during distribution disruptions. Priority given to critical facilities and emergency responders	DGS/ MOEM	BCFD, BCPD, DES, DOT, DPW, MOE	All	Medium		* Still pending	8				
IN-6: Evaluate and improve resiliency of communication systems that are in place for sudden extreme weather events (Lead Agency: MOEM)													
IN- 6	1	Utilize new technologies such as fiber optics, external hook-ups, and mobile generators to improve resiliency	MOIT/ MOEM	BGE, DOT, Energy Office, FCC, MOIT, Private Entities, PSC	All	Medium	<ul style="list-style-type: none">Federal Grant ProgramsState Grant ProgramsBaltimore City CIP	*Currently in early stages. City has moved to Voice Over Internet Protocol (VOIP) Phones and has installed more fiber optic cable to help address this issue.	9				
IN- 6	2	Evaluate, improve and build redundancy into all public and inter-agency warning and communication systems	MOEM	BCPD, BCFD, MOE, BGE, DOT, Energy Office, FCC, MOIT, PSC	All	Short	<ul style="list-style-type: none">Federal Grant ProgramsState Grant ProgramsBaltimore City CIP	*Currently in mid stages. The city has procured a mass notification system, Code Red, and is currently working with all city agencies on Standard Operating Procedures. The city has moved to Voice Over Internet Protocol (VOIP) Phones and all city agencies were encouraged to maintain several "copper" backup lines for redundancy.	8				
IN- 6	3	Identify best practices for the installation and management of flood proofing of all communications infrastructure at risk of water damage	DOP / DGS	BGE, DOT, MOE, MOEM, FCC, MOIT, Private Entities, PSC	Flooding Coastal Hazards Precipitation Variability	Short	<ul style="list-style-type: none">Federal Grant ProgramsState Grant ProgramsBaltimore City CIP	*Currently in very early stages	8				
STATE ACTION IN-6	4	STATE ACTION - Implement additional nurse triage phone lines and community health centers to reduce medical surge on hospitals	MDH	BGE, MOEM, DOT, Energy Office, FCC, MOIT, Private Entities, PSC	All	Short	<ul style="list-style-type: none">Private Funding	*Currently in very early stages	6				
IN- 6	6	Ensure continued operation of city governments various computer mainframes for email, control systems, and internet service by having stand-by batteries for each with a capacity sufficient for backup generation to operate	MOIT	BGE, DOT, Energy Office, FCC, MOEM, Private Entities, PSC	All	Short	<ul style="list-style-type: none">Baltimore City CIP	*Currently in early stages	8				
IN-7: Integrate climate change into transportation design, building and maintenance (Lead Agency: DOT)													
IN- 7	1	Determine the coastal storm vulnerability and complete an exposure assessment of City transportation assets	DOT	CSX, DOT, DPW, MTA, Private Contractors	Coastal Hazards	Short	<ul style="list-style-type: none">Federal Grant Programs	*Still Pending	9				
IN- 7	2	Improve stormwater management, operations and maintenance for stream flooding that erodes away bridge supports	DOT	CSX, DOT, DPW, MTA, Private Contractors	Flooding Precipitation Variability	Ongoing	<ul style="list-style-type: none">Incorporate into existing Capital Projects	The Department of Transportation follows the policy of the Maryland State Administration and performs post flood inspections after flooding is experienced at the susceptible bridge locations. The Bridge Engineering Section is moving away from the traditional practice of designing the storm water management facilities for its projects to the minimum standards necessary to obtain the permit for the Maryland Department of the Environment.	8				
IN- 7	3	Incorporate compliance with earthquake standards to withstand a magnitude eight earthquake for all new, improved and rebuilt bridges	DOT	CSX, DOT, DPW, MTA, Private Contractors	Land	Medium	<ul style="list-style-type: none">Federal FundsCity Capital Funds	*Still Pending	8				
IN- 7	4	Design bridges expansion joints for longer periods of high heat and develop a more robust inspection and maintenance process	DOT	CSX, DOT, DPW, MTA, Private Contractors	Extreme Heat	Short	<ul style="list-style-type: none">Incorporate into existing Capital Projects	*Still Pending	9				
IN- 7	5	Research utilizing existing and new rating systems for all new infrastructure and road projects	DOT	CSX, DOT, DPW, MTA, Private Contractors	All	Medium		*Still Pending	9				
IN- 7	6	Identify, investigate, and incorporate Best Management Practices as they relate to transportation design, construction and maintenance	DOT	CSX, DOT, DPW, MTA, Private Contractors	All	Medium		The City is now designing to the level of water that are being experienced and recorded on local flood gauges.	7				
IN- 7	7	Require that backup solar powered street lights and signals be integrated along evacuation routes and high traffic areas	DOT	CSX, DOT, DPW, MTA, Private Contractors	All	Medium	Emergency Grant Programs	*Still Pending	7				
IN-8: Identify additional alternative routes and modes for effective transport and evacuation efforts during emergency situations (Lead Agency: MOEM)													
IN- 8	2	Evaluate existing systems and coordinate a comprehensive evacuation plans with regional partners	MOEM	BCFD, BCHD, DOP, DOT, MOEM	All	Short	<ul style="list-style-type: none">Federal FundsState FundsLocal Funds	*Currently in early stages. The city has worked with the Baltimore Urban Area Security Initiative (BUASI) and have developed a draft Regional Evacuation plan that is out for comment.	8				
IN- 8	3	Develop and prioritize clearance of specified transportation routes for delivery of emergency response supplies	DOT / MOEM	BCFD, BCHD, DOP, DOT, MOEM	All	Short	<ul style="list-style-type: none">Federal FundsState FundsLocal Funds	*Still Pending	12				
IN- 8	4	Educate the public on the dangers of driving through flooded roads	DOT / MOEM	BCFD, BCHD, DOP, DOT, MOEM	Flooding Coastal Hazards Precipitation Variability	Short	<ul style="list-style-type: none">Federal FundsState FundsLocal Funds	Outreach materials, such as, "Turn Around, Don't Drown" have been distributed as part of the Frederick Avenue outreach initiative.	8				

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									Priority	Score			
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IN- 8	5	Make available a network of dedicated pedestrian and bicycle transportation routes leading into and throughout the City	DOT	BCFD, BCHD, DOP, DOT, MOEM	All	Ongoing	<ul style="list-style-type: none"> Federal Funds State Funds Local Funds 	*Currently in very early stages	12				
IN-9: Alter transportation systems in flood-prone areas in order to effectively manage stormwater (Lead Agency: DOT)													
IN- 9	1	Prioritize infrastructure upgrades for roads identified at risk of flooding through the use of elevation data and Sea, Lake and Overland Surges from Hurricanes (SLOSH) model results	DOT	Amtrak, BCRP, CSX, Developers, DOT, DPW, FHWA, MDTA, MON, NGOs	Flooding Coastal Hazards Precipitation Variability	Long	<ul style="list-style-type: none"> The City's existing capital plan 	*Still Pending	7				
IN- 9	2	Raise streets in identified flood prone areas as they are redeveloped	DOT	Amtrak, BCRP, CSX, Developers, DOT, DPW, FHWA, MDTA, MON, NGOs	Flooding Coastal Hazards Precipitation Variability	Long	<ul style="list-style-type: none"> Federal Emergency Mangement Funding programs Baltimore City Capital Budget 	*Still Pending	5				
IN- 9	3	Encourage development of Green Streets in flood prone areas and throughout the City	DOP / DOT	DOT, DPW, MON, Public, NGO's, Property Owners	Flooding Coastal Hazards Precipitation Variability	Short-Ongoing		A Complete Streets Manual was adopted by the city to encourage safer, greener streets for pedestrians, cyclists and other transportation modalities. A number of bioretention/bumpout projects were identified as part of the MS4 Permit project implementation. There have continued to be new development projects using Green Streets techniques	7				
IN- 9	4	Encourage use of permeable pavement in non-critical areas – low-use roadways, sidewalks, parking lots and alleys where soils permit proper drainage	DPW	DOT, DPW, MON, Public, NGO's, Property Owners, Rec & Parks	Flooding Coastal Hazards Precipitation Variability	Medium		*Currently in very early stages	8				
IN- 9	5	Add pumps or other mitigation alternatives to streets as they are redeveloped (if needed)	DPW	Amtrak, BCRP, CSX, Developers, DOT, DPW, FHWA, MDTA, MON, NGOs	Flooding Coastal Hazards Precipitation Variability	Long	<ul style="list-style-type: none"> Federal Emergency Mangement Funding programs Baltimore City Capital Budget 	*Still Pending	9				
IN- 9	6	Assess need for new culvert capacity and identify where upgrades are needed	DPW	Amtrak, BCRP, CSX, Developers, DOT, DPW, FHWA, MDTA, MON, NGOs	Flooding Coastal Hazards Precipitation Variability	Long	<ul style="list-style-type: none"> Emergency Grant Programs 	*Still Pending	8				
IN- 9	7	Conduct an in-depth analysis of the impacts of drain fields that feed the harbor	DPW	Amtrak, BCRP, CSX, Developers, DOT, DPW, FHWA, MDTA, MON, NGOs	Flooding Coastal Hazards Precipitation Variability	Medium-Long	<ul style="list-style-type: none"> Emergency Grant Programs 	*Currently in very early stages	12				
IN- 9	8	Expand and reinforce existing stormwater education programs	DPW	MTA, Amtrak, BCRP, CSX, Developers, DOT, DPW, FHWA, MDTA, MON, NGOs	Flooding Precipitation Variability	Long		*Currently in early stages. The Wastewater Treatment Plants are required to have Storm Water Pollution Prevention Plans (SWPPP). A requirement of these plans are to conduct annual training.	12				
IN- 9	9	Design and implement floodgates and barriers in transportation tunnels	DOT	MOEM, Amtrak, BCRP, CSX, Developers, DOT, DPW, FHWA, MON, NGOs, MTA	Flooding Coastal Hazards Precipitation Variability	Long	<ul style="list-style-type: none"> Funding options dependent on ownership of tunnel. 	*Still Pending	6				
STATE ACTION IN-9	10	STATE ACTION - Encourage Federal and State Government to design and install floodgates and barriers at vulnerable transportation tunnels	FHWA	Amtrak, BCRP, CSX, Developers, DOT, DPW, FHWA, MON, NGOs,MTA	Flooding Coastal Hazards Precipitation Variability	Long		*Currently in very early stages	11				
STATE ACTION IN-9	11	STATE ACTION - Upgrade existing floodgate hardware and mechanisms to control rise rate of water into all city tunnels	CSX, Amtrak, MTA FHWA	Amtrak, BCRP, CSX, Developers, DOT, DPW, FHWA, MON, NGOs, MTA	Flooding Coastal Hazards Precipitation Variability	Long		*Still Pending	5				
IN-10: Ensure structural stability of all transportation tunnels to reduce impact from seismic activity (Lead Agency: CSX, Amtrak, MTA)													
STATE ACTION IN-10	1	STATE ACTION - Repair cracks and leaks in all tunnels to reduce impact of seismic activity	CSX, Amtrak, MTA	Amtrak, CSX, DOT, DPW, FHWA, MDTA, MOEM, MTA	Land	Medium	Funding options dependent on ownership of tunnel.	*Still Pending	6				
STATE ACTION IN-10	2	STATE ACTION - Follow Federal, State and Local criteria for the stabilization of Historic transportation tunnels (e.g. Howard Street)	CSX, Amtrak, MTA	Amtrak, CSX, DOT, DPW, FHWA, MOEM, MTA	Land	Long	Funding options dependent on ownership of tunnel.	*Still Pending	5				
STATE ACTION IN-10	3	STATE ACTION - Install a seismically resistant fire standpipe, air monitoring, and automatic valve system in all tunnels to provide a fully automated and monitored fire suppression system	CSX, Amtrak, MTA	Amtrak, CSX, DOT, DPW, FHWA, MDTA, MOEM	Land	Long		*Still Pending	10				
IN-11: Evaluate changes to road maintenance and construction materials based on anticipated changes in climate (Lead Agency: DOT)													
IN-11	1	Implement a repaving strategy that reduces heat-related damage to asphalt and incorporates maintenance and operations that extend the life of the road surface	DOT	DOT, SHA	Extreme Heat	Long	<ul style="list-style-type: none"> The analysis of City infrastructure is an ongoing priority and could be completed as part of this ongoing process. The City's existing capital plan 	*Still Pending	8				
IN-11	3	Develop deicing strategies and materials that are effective in extreme cold temperatures and prolonged events to stabilize roadway and bridge surfaces	DOT	DOT, SHA	Precipitation Variability	Long		*Currently in very early stages	7				
IN-12: Enhance the resiliency of the City's waterfront to better adapt to impacts from hazard events and climate change (Lead Agency: DOT)													
IN-12	1	Raise bulkhead height along shoreline areas most at risk	DOT	BDC, Development Community, DGS, DHCD, DOP, DOT, MDE, MDNR, MOEM	Coastal Hazards	Long	<ul style="list-style-type: none"> Federal Funding Sources 	*Still Pending	6				
IN-12	3	Encourage the development of integrated flood protection systems that use structural (engineering) and non-structural (wetlands) measures	USACE DOT MOEM DGS	BDC, Development Community, DGS, DHCD, DOT, MDE, MDNR, MOEM	Coastal Hazards	Long	<ul style="list-style-type: none"> Federal Emergency Management Funds Wetland and Wildlife funds City Capital Budget 	The encouragement the of integrated flood protection systems that use structural (engineering) and non-structural (wetlands) measures is ongoing. Two examples include the Middle Branch Plan and Frederick Avenue Stormwater Mitigation efforts.	9				

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IN-12	4	Review and enhance coastal area design guidelines referenced in the City Code (ASCE-24-14) to better mitigate the impacts of flooding	DOP	BDC, Development Community, DGS, DHCD, DOT, MDE, MDNR, MOEM	Coastal Hazards	Long	<ul style="list-style-type: none">Federal FundsState FundsLocal Funds	The review and enhancement of coastal area design guidelines to better mitigate the impacts of flooding is ongoing. The CAMP Manual 2020 update prevents new bulkheads from being built, for example. Baltimore City Nuisance Flood Plan was developed to better track, understand, and manage nuisance flooding along the waterfront in the city	9				
IN-12	5	Enhance and strengthen waterfront zoning and permitting	DOP	BDC, Development Community, DGS, DHCD, DOT, MDE, MDNR, MOEM	Coastal Hazards	Long	<ul style="list-style-type: none">Federal FundsState FundsLocal Funds	The Critical Area Management Program and Floodplain Management Program codes were both updated over the last year. The Department of Planning completed a revision of Article 7 Natural Resources Code Division I (floodplain requirements). The revision included waterfront areas that are located within the regulatory floodplain.	8				
IN-13: Increase the resilience of all wastewater systems and protect them from current and projected extreme weather events (Lead Agency: DPW)													
IN-13	1	Ensure all water and wastewater pumping stations have off-grid, on-site energy sources and/or reliable backup power sources by increasing the number of backups and pulling electricity from different grids	DPW / MEO	DPW, Energy Office, MOEM	All	Long	<ul style="list-style-type: none">Utility CIP	*Currently in mid stages. All of the major Wastewater Pumping Station are equipped with Emergency Stand-by Generators. The drinking water pumping stations are currently being renovated. It is the desire to have backup power sources for all of them.	7				
IN-13	3	Develop and adopt increased level of protection for construction, redevelopment, and design of all water and wastewater facilities that incorporate future climate projections	DPW	DPW, Energy Office, MOEM	All	Long	<ul style="list-style-type: none">Federal FundsState FundsLocal Funds	*Still Pending. This item will be addressed individually by each future Capital Project design.	0				
IN-13	5	Establish protocols and ensure effective operations and security for wastewater treatment plants when facilities are overwhelmed during large storm events	DPW	DPW, Energy Office, MOEM	All	Long	Federal, State and Local funds	*Currently in early stages There is an Emergency Action Plan in place for each of the Wastewater Treatment Facilities. The Plans should be reviewed for possible updates. The Wastewater Facilities Division currently has SOP's for High Flow Events. The Back River Headwork's Facilities are under construction to address future events. The services for a design consultant to address such issues at the Patapsco Plant are in progress.	7				
IN-13	7	Increase stormwater recharge areas and quantity management to prevent flooding from overflows	DPW	DPW, MOEM	Flooding Precipitation Variability	Long	<ul style="list-style-type: none">Utility CIP	*Currently in very early stages	9				
IN-13	8	Conduct an assessment of the City's current water system to identify age, condition of infrastructure, capacity, weaknesses and areas for priority upgrades	DPW	DPW, MOEM	Flooding Precipitation Variability	Long		*Currently in very early stages	0				
IN-13	9	Conduct and utilize a detailed risk assessment to determine vulnerability of the sewage treatment plant to prevent overflows from extreme storm events	DPW	DPW, MOEM	Flooding Coastal Hazard Precipitation Variability	Long	<ul style="list-style-type: none">Federal FundsState FundsLocal Funds	*Currently in very early stages	8				
IN-13	10	Determine the elevation of sewage treatment buildings, tank construction details, and if the plant is at risk of back flow, for improvements to withstand coastal storm events	DPW	DPW, Planning, MOEM	Coastal Hazards	Long	<ul style="list-style-type: none">Utility CIP	*Currently in very early stages There are existing Topographical maps for the Wastewater Facilities locations.	6				
IN-13	11	Retrofit wastewater treatment facility and methane gas storage system to withstand seismic activity to protect against earthquakes. Design facility to exceed current building codes	DPW	DPW, DGS, MOEM	Land	Long	<ul style="list-style-type: none">Federal FundsState FundsLocal Funds	*Still Pending	6				
IN-14: Integrate resiliency, redundancy, and structural stability into the City's drinking and water system to ensure safe and reliable water storage and distribution (Lead Agency: DPW)													
IN-14	1	Repair leaks and improve connection from all City reservoirs and the Susquehanna River	DPW	BCHD, BCRP, DHCD, MDH, DOP, DOT, DPW, MCC, MDE, Regional Watershed Groups, Reservoir Watershed Management Committee, SHA, Water Utility	Flooding Precipitation Variability	Short-Long	<ul style="list-style-type: none">The City's existing capital planFederal Funding Sources	*Currently in very early stages. A new Capital Project should be initiated to address this item.	11				
IN-14	2	Provide water conservation education, and continue to protect our watersheds to assist in maintaining water quality	DPW	BCHD, BCRP, DHCD, MDH, DOP, DOT, DPW, MCC, MDE, Regional Watershed Groups, Reservoir Watershed Management Committee, SHA, Water Utility	Flooding Precipitation Variability	Short	<ul style="list-style-type: none">Grant ProgramsEducational Budget of Stormwater Utility	*Currently in very early stages	8				
IN-14	3	Ensure dam emergency plans account for impacts of climate change	DPW / MOEM	BCHD, BCRP, DHCD, MDH, DOP, DOT, DPW, MCC, MDE, Regional Watershed Groups, Reservoir Watershed Management Committee, SHA, Water Utility	All	Medium		*Currently in early stages Dam Emergency plans have been prepared.	12				
IN-14	4	Identify and document post damage responsibilities in memorandums of understanding as addendums to Reservoir Watershed Management Agreement	DPW	MOEM, Planning,	Flooding Precipitation Variability	Short		*Still Pending Watershed Management Agreement is still pending.	7				
IN-14	5	Review dam capacity, load and failure points and review them against 1,000 year and 10,000 year precipitation events	DPW / MOEM	BCHD, BCRP, DHCD, MDH, DOP, DOT, DPW, MCC, MDE, Regional Watershed Groups, Reservoir Watershed Management Committee, SHA, Water Utility	Flooding Precipitation Variability	Medium	Federal Emergency Grants	*Currently in very early stages Reviews may have been done by MDE.	5				

Strategy #	Action #	Action	Action Lead Agency	Stakeholders	Hazard	Estimated Timeframe (short 1-2yrs, med 3-5yrs, long 6+)	Financing Options	Status	Priority Score (w/o CAP Overlap Values)		2018 DP3 Update Prioritization		
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IN-14	6	Conduct a study to determine seismic design standards and seismic resiliency of drinking water distribution system (tunnels, piping, clean water pump stations, dams, shafts, and tanks)	DPW	BCHD, BCRP, DHCD, MDH, DOP, DOT, DPW, MCC, MDE, Regional Watershed Groups, Reservoir Watershed Management Committee, SHA, Water Utility	Land	Medium	Federal Emergency Grants	*Still Pending	8				
IN-14	7	Increase stormwater recharge areas and quantity management	DPW	BCHD, BCRP, DHCD, MDH, DOP, DOT, DPW, MCC, MDE, Regional Watershed Groups, Reservoir Watershed Management Committee, SHA, Water Utility	Flooding Precipitation Variability	Short		*Currently in very early stages	5				
IN-14	8	Evaluate the impacts of sediment loading on reservoir capacity	DPW	BCHD, BCRP, DHCD, MDH, DOP, DOT, DPW, MCC, MDE, Regional Watershed Groups, Reservoir Watershed Management Committee, SHA, Water Utility	Flooding Precipitation Variability	Short	Utility CIP funds	*Currently in early stages Evaluations are pending.	8				
STATE ACTION IN-14	9	STATE ACTION - Manage watershed forests to provide maximum benefits for water quality and to maintain resiliency during extreme weather events	MDNR	BCHD, BCRP, DHCD, MDH, DOP, DOT, DPW, MCC, MDE, Regional Watershed Groups, Reservoir Watershed Management Committee, SHA, Water Utility	Flooding Precipitation Variability	Short		*Still Pending	11				
IN-14	10	Adopt new policies on salt application to prevent high salinization on drinking water supplies	DOT	DPW, MDE, SHA, Balto Co Govt, Regional watershed groups, NGO's	Flooding Precipitation Variability	Medium	• Federal Funds • State Funds • Local Funds	*Still Pending	6				
IN-14	11	Establish a structured Firing Program to maintain adequate storage and water quality in the source-water reservoirs during drought conditions	DPW / MOEM	BCHD, BCRP, DHCD, MDH, DOP, DOT, DPW, MCC, MDE, Regional Watershed Groups, Reservoir Watershed Management Committee, SHA, Water Utility	Precipitation Variability	Medium		*Currently in very early stages Firing Program has not been reviewed and updated. Still Pending.	5				
IN-14	12	Maintain appropriate agreements with Susquehanna River Basin Commission (SRBC) and the Exelon Power Company to ensure adequate water withdraws from the Susquehanna River during drought emergency	DPW	BCHD, BCRP, DHCD, MDH, DOP, DOT, MOEM, MCC, MDE, Regional Watershed Groups, Reservoir Watershed Management Committee, SHA, Water Utility	Precipitation Variability	Medium		*Currently in early stages A new Capital Project should be initiated to address this item. Agreements are being made, reviewed, and updated with the help of the Legal Office.	0				
IN-15: Conduct an assessment that evaluates and improves all pipes' ability to withstand extreme heat and cold (Lead Agency: DPW)													
IN-15	1	Replace old and malfunctioning pipes with new pipes and pipe lining technologies	DPW	DOT	Flooding Precipitation Variability	Long	• The analysis of City infrastructure is an ongoing priority and could be completed as part of this ongoing process. • The City's existing capital plan	*Currently in early stages Look to California for materials used that transfer water safely and bend, but not break when combating earthquakes. New technologies exist that go beyond typical sealing.	11				
IN-16: Enhance and expand stormwater infrastructure and systems (Lead Agency: DPW)													
IN-16	1	Implement the requirements of Baltimore's MS4 (separate stormwater and sewer system) permit	DPW	Community Groups, DOT, DPW, MOEM, MDNR, NGOs, Private Developers, Stormwater Utility	Flooding Precipitation Variability	Short	• The Stormwater Utility existing capital plan	The work to develop projects under the new MS4 permit is progressing, and numerous stream restoration projects are being constructed or will be constructed soon. In addition, the Green Network Plan identifies stream corridors as Nature Corridors for protection and enhancement.	9				
IN-16	2	Prioritize storm drain upgrades and replacement in areas with reoccurring flooding	DPW	DOT, Community Groups	Flooding	Short	Stormwater Utility	*Currently in very early stages	7				
IN-16	3	Install backflow-prevention devices or other appropriate technology along waterfront to reduce flood risk	DPW	Community Groups, DOT, MOEM,	Flooding Coastal Hazards Precipitation Variability	Medium-Long	• Federal Funds • State Funds • Local Funds	*Currently in very early stages	8				
IN-16	4	Preserve and protect natural drainage corridors	DPW	Community Groups, DOT, DPW, MOEM, MDNR, NGOs, Private Developers, Stormwater Utility	Flooding	Short	Ongoing as part of environmental enforcement efforts and stream restoration projects.	Numerous stream restoration projects are being constructed or will be constructed soon.	0				
IN-16	5	Review and revise storm drain design on a continuous basis, to accommodate projected changes in intense rainfall	DPW	Community Groups, DOT, DPW, MOEM, MDNR, NGOs, Private Developers, Stormwater Utility, USACE	Flooding	Long, Ongoing	• The analysis of City infrastructure is an ongoing priority and could be completed as part of this ongoing process. • The City's existing capital plan	*Still Pending	0				
NEW 2018 DP3 ACTION IN-16	6	Pursue grants for Flood Control measures to alleviate flooding in the most flood prone areas when and where feasible	MOEM	All City Agencies	Flooding	Ongoing	FEMA grants, State Grants, Philanthropic efforts	The Office of Emergency Management (OEM), along with other city agencies, are pursuing grants for mitigation in various flood prone areas in the City.					
IN-17: Modify urban landscaping requirements and increase permeable surfaces to reduce stormwater runoff (Lead Agency: DOP)													

Strategy #	Action #	Action	Action Lead Agency	Stakeholders	Hazard	Estimated Timeframe (short 1-2yrs, med 3-5yrs, long 6+)	Financing Options	Status	Priority Score (w/o CAP Overlap Values)		2018 DP3 Update Prioritization		
									Priority	Score			
									Low	5.0-7.0			
									Med	8.0-9.0			
									High	10.0-12.0	First: High Priority/ "All" Hazards	Second: High Priority/ 2 or more Hazards	Third: 2 or more Hazards
IN-17	2	Encourage urban landscaping requirements and permeable surfaces into community managed open spaces	DOP	BCRP, BDW, BDC, Citizens, DHCD, DOT, DPW, NGOs, Private Developers	Flooding	Short	Small grants programs at Parks and People, Other Foundation Grants	The encouragement of urban landscaping requirements and permeable surfaces into community-managed open spaces is ongoing. The action is sponsored by the Critical Area Management Program offset-fee grants and DPW grants for impervious surface removal, rain garden installation, etc.	10				
IN-17	3	Utilize water conservation elements such as green roofs, rain gardens, cisterns, and bioswales on residential, commercial, industrial, and City-owned properties to capture stormwater	HCD / DOP/ DPW	BDC, BCRP, BDW, Citizens, DHCD, DOP, DOT, DPW, NGOs, Private Developers	Flooding	Short-Medium		MS4 Permit Implementation and 21st Century School projects are increasing the use of these techniques on City-owned properties. Critical Area code has a 10% nutrient reduction requirement for stormwater management, and developers typically met that through the practices listed within the DP3.	5				
IN-17	4	Encourage permeable paving on low-use pathways	DOP	BCRP, BDC,, Citizens, DHCD, DOT, DPW, NGOs, Private Developers	Flooding	Medium		*Currently in very early stages. Permeable paving may not be able to be used on most soils in the city because they are compacted or consist of urban fill. Need to verify with DPW whether it makes sense to include permeable paving in any of the actions, since the actions can't be achieved if DPW doesn't approve of the use/designs. Need to evaluate changing action to "Address barriers to increased use of permeable paving."	7				
NEW 2018 DP3 ACTION IN-17	5	Pursue grants for Floodplain Storage and Diversion projects to alleviate flooding in the most flood prone areas when and where feasible	MOEM	All City Agencies	Flooding	Ongoing	FEMA grants, State Grants, Philanthropic efforts	Hydrology and hydraulics (H&H) study for the Frederick Avenue corridor is scheduled to be completed by 2021.					
IN-18: Evaluate and support DPW's stream maintenance program. (Lead Agency: DPW)													
IN-18	1	Review and improve status of standing maintenance requirements	DPW	DOT, DOP, MDE, MDNR, MOEM, USACE	Flooding	Ongoing	• The analysis of City infrastructure is an ongoing priority and could be completed as part of this ongoing process. • The City's existing capital plan	*Currently in very early stages	9				
IN-18	2	Ensure adequate funding is in place to support stream maintenance	DPW	DOT, DOP, MDE, USACE	Flooding	Ongoing	Stormwater Utility CIP	*Currently in early stages	11				
IN-18	3	Identify opportunities where stream restoration efforts will off-set maintenance costs	DPW	DOT, DNR, MDE, MDNR, MOEM, USACE	Flooding	Ongoing		*Currently in very early stages	8				
IN-18	4	Identify interdependencies and benefits of stream maintenance with other transportation programs	DOT	DPW, MDE, MDNR	Flooding	Ongoing		*Still Pending	8				
IN-18	5	Conduct regular maintenance of streams and stormwater quality facilities: clear streams, prioritize dredging, increase inspection and cleaning of culverts and storm drains	DPW	DOT, MDE, MOEM, USACE	Flooding	Ongoing	Stormwater and DOT ongoing maintenance programs • Federal Grants • State Grants • Local Grants • Foundation Grants	*Currently in early stages	9				
IN-19: Support and increase coordination and information sharing across jurisdictions to better enable mitigation of cross-border impacts on the regions watersheds (e.g., understanding flood conditions upstream in the County) (Lead Agency: DPW)													
IN-19	1	Partner with local counties to evaluate major tributaries in all watersheds to determine best management practices for capturing run-off and slowly releasing it (stormwater quantity management)	DPW	BCRP, County Governments, DOP, DPW, MCC, MDNR, NGOs, Stormwater Utility	Flooding	Ongoing		Baltimore continues to participate in the Baltimore Urban Waters and Baltimore Wilderness groups, which promote information sharing among jurisdictions.	9				
IN-20: Reevaluate and support a comprehensive debris management plan for hazard events (Lead Agency: DPW)													
IN-20	2	Expand and integrate existing programs to reduce or intercept debris before it gets into the streams and harbor	DPW	DPW, DOT, NGOs	Flooding Coastal Hazards	Medium	Stormwater Utility Operating Programs and CIP	Four trash wheels have been implemented, with one additional added this year at the base of the Gwynns Falls.	11				
IN-20	3	Investigate, develop and promote solid waste management actions for disposing of waste debris removal before a hazard event	DPW	DOP, R&P, MOEM, NGOs	Flooding Coastal Hazards Precipitation Variability Wind	Short	Existing trash management education budgets.	*Currently in very early stages	10				
IN-21: Encourage the integration of climate change and natural hazards into private and State planning documents, systems, operations, and maintenance. (Lead Agency: DOP)													
IN-21	1	Incorporate consideration of hazards and climate adaptation efforts into all plans, systems, operations, and maintenance.	DOP	DPW, DOT, DGS, SHA, MTA, MEMA, MOEM	All	Medium		A Sustainability and Resiliency Subcabinet was established under the Mayor's Office in 2021 to accelerate implementation of priority sustainability, adaptation, and resiliency action items across government A Flooding and Infrastructure Subcabinet Working Group was created to specifically address flooding and infrastructure issues. A Climate Planning Subcabinet Working Group was created to specifically integrate hazards and climate adaptation efforts into planning processes In the development of the 2020 Less Waste, Better Baltimore Plan, hazard planning was integrated so as to suggest increased capacity for the landfill in case of disaster	6				
IN-21	2	Ensure Red Line planning incorporates adaptation strategies.	DOP	DOT, DOP	All	Short		*Still Pending	10				
IN-21	3	Ensure hazard scenarios, utilized in vulnerability assessments, are at a minimum 25% greater in intensity and impact than historical record events to date.	DOP	MOEM, DOT, Health Care Community, Hospitals, MD2HE, MEMA, MTA, MOEM, SHA	All	Ongoing		*Still Pending	7				
IN-21	4	Develop guidelines for hospital, health care facilities and other institutional entities (e.g. Universities).	BCHD	DOT, Health Care Community, Hospitals, MD2HE, MEMA, MTA, MOEM, SHA	All	Ongoing	Utilize Hazard Mitigation Grant Programs	*Still Pending	7				
IN-21	5	Partner with regional air quality institutions to integrate air quality measures and messaging into City climate change policy efforts	BCHD	Health Care Community, Hospitals, MEMA, MTA, MOEM, SHA	Extreme Heat	Ongoing		*Currently in very early stages BCHD does some public messaging when poor air quality alerts are issued by MDE; additional work constrained by staff resources.	7				
IN-22: Develop City policy which requires new city government capital improvement projects to incorporate hazard mitigation principles. (Lead Agency: DOP)													

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									High	10.0-12.0	FIRST: High Priority/ "All" Hazards	SECOND: High Priority/ 2 or more Hazards	THIRD: 2 or more Hazards
IN-22	1	Discourage new public projects in hazard-prone areas such as floodplains or the coastal high hazard areas	DOP	BCHD, BCRP, DGS, DOT, DPW, MOEM	Flooding Coastal Hazards	Short to Medium; Ongoing	• The City's existing capital plan	*Currently in mid-stages If development is discouraged in floodplains and in coastal areas and properties are purchased in those areas, there may need to be some sort of restoration and recreation projects in those locations (stream restoration, reforestation, shoreline restoration, trails, creation of recreation areas that can withstand flooding).	10				
IN-22	2	Utilize hazard mitigation design requirements that exceed minimum standards for critical facilities	DOP	BCHD, BCRP, DGS, DOT, DPW, Energy Office, MOEM	All	Short to Medium; Ongoing		*Currently in early stages	6				
IN-22	3	Use comprehensive infrastructure assessments to identify infrastructure in need of replacement and prioritize funding for those projects	DGS	BCHD, BCRP, DOP, DOP, DOT, DPW, Energy Office, MOEM	All	Short to Medium; Ongoing		The use of comprehensive infrastructure assessments to identify infrastructure in need of replacement and prioritize funding for those projects is ongoing. System for improved asset management and prioritization of infrastructure needs/CIP funding allocation has recently begun	6				
B-1: Develop and implement hazard protections for critical facilities including hospitals, fire stations, police stations, hazardous material storage sites, etc. (Lead Agency: MOEM)													
B- 1	1	Conduct educational outreach for city-owned, residential, commercial, and industrial buildings about proper storage and disposal of hazardous materials and heating oil	MOEM	BGE, DGS, DOP, DPW, Hospitals, Material Storage Sites	Flooding	Short	Utilize Hazard Mitigation Grant Programs	*Still Pending. Work delayed due to staffing shortages, but MOEM will work in the future through the Local Emergency Planning Committee (LEPC).	10				
B- 1	2	Require hazardous materials stored in city-owned, residential, commercial, and industrial buildings within the floodplain to be elevated a minimum of three feet above the freeboard	DOP	BGE, DGS, DOP, Hospitals, Material Storage Sites	Flooding	Medium		The requirement for hazardous materials stored in city-owned, residential, commercial, and industrial buildings within the floodplain to be elevated a minimum of 3 feet above the freeboard has not been drafted or implemented, as yet. Note: The current requirement is consistent with ASCE 24, which mandates a 2 FT of freeboard over the 0.2% annual chance of flood elevation for tidal areas	12				
B- 1	3	Require new critical facilities to be designed with redundant operating systems	MOEM	BGE, DGS, DOP, Hospitals, Material Storage Sites	All	Long	Existing Capital Budgets	*Currently in early stages New Schools are required to have backup generators or Generator hook ups.	8				
B- 1	4	Require pre-wiring for generators at all facilities designated critical to agency operations and hazard response	MOEM	BCRP (Forestry), BGE, Building Owners, DGS, DOT, DPW, Exelon, PSC, Utility customers, Veolia, Wheelabrator	All	Short-Medium	• Baltimore City CIP • Federal Sources • BGE's existing funds allocated through the Smart Grid Investment Grant	*Still Pending	8				
B- 1	5	Develop stricter flood regulations for critical facilities	DOP	BGE, DGS, MOEM, Hospitals, Material Storage Sites	Flooding	Medium		* Implemented/On-going	9				
B- 1	7	Coordinate delivery of fuel and/or access to fuel for critical facility emergency generators.	MOEM	BGE, DGS, DOP, Hospitals, Material Storage Sites	All	Ongoing. As facilities change and needs for generator power changes.		*Still Pending MOEM currently coordinates fuel deliver and availability for critical facilities during emergencies.	11				
B-2: Enhance City building codes that regulate building within a floodplain or near the waterfront (Lead Agency: DOP)													
B- 2	1	Design new projects to be resilient to a mid-century sea level rise projection and adaptable to longer-term impacts	DOP / DHCD	Baltimore County, BDC, DPW, MDE, Utilities	Coastal Hazards		Existing Capital Budgets	*Currently in very early stages	7				
B- 2	2	Incorporate climate change and coastal hazard considerations into building codes by increasing freeboard requirements to two feet as buildings are redeveloped and renovated	DOP	Baltimore County, BDW, DHCD, DPW, MDE, Utilities	Flooding Coastal Hazards	Short		The Incorporation of climate change and coastal hazard considerations into building codes by increasing freeboard requirements to 2 feet as buildings are redeveloped and renovated has been completed. The freeboard requirement for coastal high hazard areas and coastal resilience areas (1% and 0.2% annual chance of flood areas) is 2 FT above the 0.2% annual chance of flood elevation.	7				
B- 2	3	Continue to regulate to the existing tidal floodplain delineation as adopted 2 February, 2012	DOP	Baltimore County, BDC, DHCD, DPW, MDE, Utilities	Coastal Hazards	Short		* Implemented/On-going	7				
B- 2	4	Incorporate outfall elevation regulations	DOP / DPW	Baltimore County, BDW, DHCD, MDE	Flooding Coastal Hazards	Short-Medium		*Currently in very early stages	8				
B- 2	5	Develop and share Construction Best Practices for development within floodplains	DOP	Baltimore County, BDC, DHCD, DPW, MDE, Utilities	Flooding	Short		*Currently in early stages	0				
B- 2	6	Train all code enforcement and building inspectors about flood proofing techniques and the local floodplain ordinance	DOP	Baltimore County, BDW, DHCD, DPW, MDE, Utilities	Flooding Coastal Hazards	Medium		*Currently in early stages	7				
B- 2	7	Encourage green roof installations to include vegetative and reflective technologies for all new commercial, industrial, multifamily, and city-owned development	HCD	BDC, DHCD, DOP, DPW, MDE, Utilities	Flooding	Medium		* Still pending	10				
B-3: Strengthen City zoning, floodplain and construction codes to integrate anticipated changes in climate (Lead Agency: DOP)													
B- 3	1	Review zoning and strengthen language (where necessary) in order to better protect citizens and increase resiliency in buildings	DOP	BDC, City Government, Community Groups, DHCD, DGS, DPW, NAHB, NGOs, MDE, Private developers, Private land owners	All	Medium	Local Funding	*Currently in early stages	9				
B- 3	2	Review and amend existing building and floodplain regulations to require more flood resistant new and existing structures when located in the floodplain	DOP	BDC, City Government, Community Groups, DHCD, DGS, DPW, NAHB, NGOs, MDE, Private developers, Private land owners	Flooding Coastal Hazards	Medium, Ongoing	Local Funding	The review and amendment of existing building and floodplain regulations to require more flood-resistant new and existing structures when located in the floodplain has been completed. The Baltimore City Building, Fire and Related Codes have been updated on May 18, 2020 and include the latest updates to the Article 7 Natural Resources Code (floodplain requirements).	8				

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B- 3	3	Utilize open space category in zoning code to protect sensitive areas (e.g. stormwater sites, steep slopes, floodways, etc.)	DOP	BDW, City Government, Community Groups, DHCD, DGS, DPW, NAHB, NGOs, MDE, Private developers, Private land owners	Flooding	Medium		The utilization of open space category in zoning code to protect sensitive areas (stormwater sites, steep slopes, floodways, etc.) is ongoing. Regarding the protection of stormwater management (SWM) facilities, Article 7 Natural Resources Code requires that SWM facilities sites be placed under conservation easements or similar instrument to protect the areas from being redeveloped. The Zoning Code section that addresses the Critical Area Management Program requires that open space where mitigation plantings have been installed must be placed under a conservation easement or similar legal instrument to preserve the area in perpetuity		6			
B- 3	4	Review and increase Flood Protection Elevation (Base Flood Elevation + Freeboard) standards to the highest available State, Federal or local elevation level	DOP	BDW, City Government, Community Groups, DHCD, DGS, DPW, NAHB, NGOs, MDE, Private developers, Private land owners	Flooding Coastal Hazards	Short	<ul style="list-style-type: none"> Federal Funds State Funds Local Funds 	The review and increasing of Flood Protection Elevation (Base Flood Elevation + Freeboard) standards to the highest available State, Federal or local elevation level has been completed.		9			
B- 3	5	Evaluate and update stormwater management regulations to avoid increases in downstream flooding	DOP	BDC, Community Groups, DHCD, DGS, DPW, NAHB, NGOs, MDE, Private developers, Private land owners	Flooding	Short	<ul style="list-style-type: none"> Federal Funds State Funds Local Funds 	* Currently in early stages		8			
B- 3	6	Adopt design requirements that include wet and dry flood proofing techniques	DOP	BDC, Community Groups, DHCD, DGS, DPW, NAHB, NGOs, MDE, Private developers, Private land owners	Flooding Coastal Hazards	Short	<ul style="list-style-type: none"> Federal Funds State Funds Local Funds 	* Implemented/Ongoing		10			
B- 3	7	Review and consider adoption of the International Green Construction code	HCD	BDC, DOP, Community Groups, DHCD, DGS, DPW, NAHB, NGOs, MDE, Private developers, Private land owners	Flooding Extremem Heat	Short Ongoing	Local Funding	The International Green Construction code is included and required under the Building, Fire and Related Codes of Baltimore City.		9			
B-4: Update a list of flood prone and repetitive loss buildings to consider for acquisition. (Lead Agency: DOP)													
B- 4	1	Continue to acquire property (including repetitive loss properties) in the special flood hazard areas where feasible and appropriate	DOP	DHCD, MEMA, MDE, Office of Real Estate	Flooding Coastal Hazards	Ongoing	<ul style="list-style-type: none"> Additional funds may be needed for print publications and web-based materials Explore funding opportunities from MEMA, FEMA, MOEM, and other agencies 	* Currently in mid-stages		10			
B- 4	2	Prioritize Hazard Mitigation Assistance funding for mitigation of repetitive loss properties and severe repetitive loss properties	MOEM	DHCD, DOP, MEMA, MDE, Office of Real Estate	Flooding Coastal Hazards	Ongoing	<ul style="list-style-type: none"> Federal Funds State Funds Local Funds 	*Currently in early stages Ensure repetitive loss (RL) properties and severe repetitive loss (SRL) properties are given priority in project ranking procedure.		9			
B- 4	3	Develop a creative financing program for flood resiliency in industrial buildings	DOP	DHCD, MEMA, MDE, Office of Real Estate	Flooding Coastal Hazards	Ongoing	<ul style="list-style-type: none"> Federal Funds State Funds Local Funds 	*Currently in very early stages		11			
NEW 2018 DP3 ACTION B-4	4	Pursue grants to acquire flood prone properties when and where feasible	MOEM	All city agencies	Flooding	Ongoing	FEMA grants, State Grants, Philanthropic efforts	* New					
B-5: Improve wind resiliency of new and existing structures. (Lead Agency: DCHD)													
B- 5	1	Review local building codes to determine if revisions are needed to improve the structures ability to withstand greater wind velocities and storm impacts	HCD	BDC, Commercial Building Owners, DGS, DOP, MDE, MOEM, Private Developers	Wind	Short	Federal Funding Sources	* Still pending		8			
B- 5	2	Retrofit emergency shelter windows to withstand winds associated with coastal storm events	DGS	Commercial Building Owners, DCHD, DGS, DOP, MDE, MOEM, Private Developers	Wind	Long	Federal Emergency Management Funding	* Still pending		7			
B-6: Evaluate various seismic design enhancements using prototypical Baltimore City building types. (Lead Agency: DGS)													
B- 6	1	Determine engineering effectiveness and cost-benefit of various earthquake mitigation measures using computer modeling	DGS	DCHD, MOEM, USGS	Land	Short	<ul style="list-style-type: none"> The analysis of City infrastructure is an ongoing priority and could be completed as part of this ongoing process. The City's existing capital plan 	*Still pending		5			
B-7: Retrofit existing buildings in the designated Flood Area to increase resiliency (Lead Agency: DOP)													
B- 7	1	Target and encourage flood resiliency retrofits for buildings in the designated Flood Area	DOP	BDC, DHCD, DPW, Federal and State Partners, MCC, MON, NGOs, MOEM	Flooding Coastal Hazards	Long	<ul style="list-style-type: none"> Federal Funding Sources Housing Recovery Funding NFIP Commercial Insurance Policies FEMA Public Assistance Program 	*Currently in early stages		7			
B- 7	2	Prioritize retrofitting and increasing resiliency of Public Housing units in the designated Flood Area and other high risk areas	DOP / DHCD	BDC, DPW, Federal and State Partners, MCC, MON, MOEM	Flooding Coastal Hazards	Long		*Currently in early stages		6			
B- 7	3	Educate building owners within the floodplain to ensure that all electrical, mechanical, and key building systems are above the base flood elevation and meet existing codes	DOP	BDC, DHCD, DPW, Federal and State Partners, MCC, MON, NGOs, MOEM	Flooding Coastal Hazards	Long		The education of building owners within the floodplain to ensure that all electrical, mechanical, and key building systems are above the base flood elevation and meet existing codes is ongoing. This is completed through the floodplain review permit review process.		10			

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NEW 2018 DP3 ACTION B-7	4	Pursue grants to elevate flood prone properties when and where feasible	MOEM	All city agencies	Flooding	Ongoing	FEMA grants, State Grants, Philanthropic efforts	* New					
NEW 2018 DP3 ACTION B-7	5	Pursue grants for dry flood proofing of Commercial and Historic structures in the most flood prone areas when and where feasible	MOEM	All city agencies	Flooding	Ongoing	FEMA grants, State Grants, Philanthropic efforts	* New					
B-8: Improve resource conservation practices in all city owned buildings (Lead Agency: DGS)													
B- 8	1	Install energy-efficient and low-water-use equipment during renovations in all City-owned buildings	DGS	MOE, BCPSS, DCHD, DGS, DOP	All	Medium	• MEA's Jane E. Lawton Conservation Loan Program • MEA's State Agency Loan Program (SALP)	* Currently in early stages	10				
B- 8	2	Support energy efficiency and weatherization as part of Baltimore City schools ten-year plan	DOP	MOE, BCPSS, DCHD, DGS	All	Short	BCPSS CIP	* Currently in mid-stages	11				
B- 8	3	Update Baltimore green building standards by offering multiple compliance paths for new and substantially renovated construction	DOP / DHCD	BCPSS, DCHD, DGS, DOP	All	Medium		*Currently in advanced stages	8				
B-9: Conduct educational outreach to increase resource conservation practices in private buildings (Lead Agency: DOP)													
B- 9	1	Conduct educational outreach and provide information about savings related to reduced water use	DPW	BCPSS, BGE, DOP, DOP, Exelon, MON, NGOs, MOEM	Precipitation Variability	Short	• Housing Recovery Funding • MEA's Jane E. Lawton Conservation Loan Program	* Currently in very early stages	10				
B- 9	2	Educate and provide resources and information about utility rebate programs	BGE	BCPSS, DOP, DPW, Exelon, MON, NGOs, MOEM	Extreme Heat	Short		*Currently in advanced stages	12				
B- 9	3	Provide energy efficiency education to include information on conserving electrical power. Emphasize reductions during summer peak demand hours	DOP	BCPSS, BGE, DPW, Exelon, MON, NGOs, MOEM	All	Short	State, Local and Foundation Funding	* Currently in mid-stages	12				
B-10: Use HAZUS-MH computer modeling to determine losses generated by coastal storms (Lead Agency: DOP)													
B-10	1	Utilize engineering studies and cost-benefit analyses to identify additional mitigation needs and actions	DOP	FEMA, MEMA, MOEM, NOAA	All	Short	Emergency Management Grant Programs	* Currently in early stages	8				
B-10	2	Evaluate various building design enhancements to reduce losses generated by earthquakes, floods, and storm surge	DOP	DHCD,FEMA, MEMA, MOEM, NOAA	Land	Short		* Currently in very early stages	6				
NS-1: Utilize green corridors and parks to help protect surrounding communities from the impacts of hazard events (Lead Agency: BCRP)													
NS-1	1	Evaluate green corridors and parks for possible improvements for floodplain management		Rec & Parks	Flooding	Medium		The evaluation of green corridors and parks for possible improvements for floodplain management is ongoing. Many stream restoration projects by DPW are happening in Parks as a co-benefit to the MS4 permit requirements, but more could still be done to a better extent specifically for floodplain management.	6				
NS-1	2	Increase the resiliency of park facilities and buildings		R&P	all	Medium	Ongoing R&P Capital Budget	* Currently in very early stages	7				
NS-2: Increase and enhance the resilience and health of Baltimore's urban forest. (Lead Agency: BCRP, Forestry)													
NS-2	1	Anticipate the impacts of future changes in temperature and weather on the urban forest by developing a comprehensive list of plant and tree species known to have a broad range of environmental tolerances		Rec & Parks	Flooding Precipitation Variability	Short	Local and Foundation Funding	* Currently in advanced stages	11				
NS-2	2	Establish and routinely update a comprehensive tree inventory to anticipate insect and forest structural impacts of climate change		Rec & Parks	Precipitation Variability	Short	State, Local and Foundation Funding	* Currently in mid-stages	11				
NS-2	3	Establish a comprehensive maintenance program that includes pruning for sound structure and the removal of hazardous limbs and trees. First focus on areas where vulnerable infrastructure is nearby such as energy supply and roads		Rec & Parks	Precipitation Variability Wind	Medium	R&P Operating Budget Federal, State, Local and Foundation Funding	* Currently in very early stages	10				
NS-2	4	Continually adjust and modify planting details and specifications to assure the health and longevity of trees		Rec & Parks	Precipitation Variability	Short	Federal, State, Local and Foundation Funding	* Currently in mid-stages	6				
NS-2	5	Increase the urban tree canopy and target areas with urban heat island impacts		Rec & Parks	Precipitation Variability	Ongoing	Baltimore City Capital Budget, Mitigation Funds, Forest Conservation Program	* Currently in mid-stages	8				
NS-3: Create an interconnected network of green spaces to support biodiversity and watershed based water quality management (Lead Agency: DOP)													
NS- 3	1	Utilize the Baltimore Green Network to increase green spaces in areas where there is available vacant land in order to reduce the heat island effect	DOP	HCD, DPW, Rec & Parks, BDC, State Agencies, Federal Agencies, NGO's, Community Groups	Extreme Heat	Ongoing	• Federal Grants • State Grants • Foundation Grants	The utilization of the Baltimore Green Network Plan to increase green spaces in areas where there is available vacant and to reduce the heat island effect and provide other benefits is ongoing. Both Rachel Wilson and Cab Calloway parks are well underway.	10				
NS- 3	2	Convert vacant land and row houses into meaningful and connected open space	HCD	BCRP, BDC, Community Groups, DHCD, DOP, DPW, Federal Agencies, MDNR, NGOs, State Agencies	Flooding	Ongoing	• Baltimore City Bond Funds	* Currently in early stages	7				
NS- 3	3	Complete a habitat analysis and plan for the City	DOP	BCRP, BDC, Community Groups, DHCD, DPW, Federal Agencies, MDNR, NGOs, State Agencies	All	Ongoing	• Federal Grants • State Grants • Foundation Grants	* Currently in very early stages A comparison is needed to this and related recommendations against the biodiversity and natural systems sections of the Sustainability Plan update so that the recommendations are coordinated. It would be better to have them be the same as or reference each other rather than creating more actions by not having them aligned.	9				

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NS- 3	4	Create a strategic plan that identifies areas of focus for tree planting, stormwater management, and forest preservation	DOP	BCRP, BDC, Community Groups, DHCD, DPW, Federal Agencies, MDNR, NGOs, State Agencies	Flooding	Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Currently in early stages The BGN does this to some extent, and the MS4 WIP and upcoming update has/will identify priorities for stormwater management. Also need to coordinate this recommendation with those in the Sustainability Plan update.	8				
NS- 3	5	Certify Baltimore as a Community Wildlife Habitat through the National Wildlife Foundation (NWF)	DOP	BCRP, BDC, Community Groups, DHCD, DPW, Federal Agencies, MDNR, NGOs, State Agencies	All	Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Implemented/Ongoing	10				
NS-4: Expand, protect and restore riparian areas in the city (Lead Agency: DOP)													
NS- 4	2	Evaluate current regulations regarding stream buffers and floodplains and modify them (if appropriate) to assure they adequately protect perennial stream corridors	DOP	BCRP, DOP, DPW	Flooding	Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Local Grants Foundation Grants 	* Currently in mid-stages	8				
NEW 2018 DP3 ACTION NS- 4	3	Evaluate potential for completion of Maidens Choice stream restoration project (Army Corps of Engineers, Baltimore District identified project)	ACE	DOT, DPW	Flooding	Long	FEMA grants, State Grants	* New					
NS-5: Preserve and create new coastal buffer efforts and support creating more wetlands and soft shoreline along coastal areas (Lead Agency: DOP)													
NS- 5	1	Integrate natural buffer requirements, such as wetlands and soft shorelines, into new development or redevelopment	DOP	BCRP, BDC, DPW, NGOs, State Agencies, Waterfront Partnership	Coastal Hazards	Short	<ul style="list-style-type: none"> Federal Grants State Grants Local Grants Foundation Grants 	The integration of natural buffer requirements, such as wetlands and soft shorelines, into new development or redevelopment is ongoing. The maintenance of soft shorelines is required from projects located on sites that currently have green/soft shorelines. The requirements if put forth through the Critical Area Management Program Manual 2020 Edition, which is authorized by the Baltimore City Zoning Code.	8				
NS- 5	2	Complete stream restoration projects in Baltimore City and County stream valleys that lead into the coastal wetlands so as to increase habitat and reduce sedimentation	DPW	BCRP, BDC, DOP, DPW, NGOs, State Agencies, Waterfront Partnership	Flooding	Long	<ul style="list-style-type: none"> Federal Grants State Grants Local Grants Foundation Grants 	* Currently in early stages	8				
NS- 5	3	Identify and evaluate areas in the Critical Area buffer to prioritize ecological buffer restoration efforts	DOP	BCRP, BDC, DPW, NGOs, State Agencies, Waterfront Partnership	Coastal Hazards	Medium	<ul style="list-style-type: none"> Critical Area Buffer Offset Fees Private Funds 	The identification and evaluation of areas in the Critical Area buffer for prioritization of ecological buffer restoration efforts is ongoing. The maintenance of soft shorelines is required from projects located on sites that currently have green/soft shorelines. The requirements if put forth through the Critical Area Management Program Manual 2020 Edition, which is authorized by the Baltimore City Zoning Code	9				
NS-6: Require the City's drought management plan to account for changes in climate. (Lead Agency: DPW)													
NS- 6	1	Map drought risks and water availability via climate change scenarios	DPW	BCHD, Water Utility	Precipitation Variability	Short	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Still pending Mapping of drought risk and water availability via climate change is still pending.	9				
NS- 6	2	Update drought management plans to recognize changing conditions	DPW	BCHD, Water Utility	Precipitation Variability	Short		* Still pending	12				
NS-7: Integrate climate change and natural hazards planning into small watershed action plans (SWAPs) (Lead Agency: DOP)													
NS- 7	1	Review existing watershed management plans and identify future actions to address climate impacts	DOP	DPW, NGO's	Flooding Coastal Hazards Precipitation Variability	Ongoing		* Currently in early stages	8				
NS-8: Conduct detailed ongoing analysis of climate information, trends in storm events and hydrology to support policy changes responding to climate change (Lead Agency: DOP)													
NS- 8	1	Expand the use of climate information (e.g. seasonal forecasts) in water resources planning and management.	DOP	BDC, FEMA, MDE, MDNR, MEMA, NGOs, State Agencies, Waterfront Partnership	Flooding Coastal Hazards Precipitation Variability	Short	State, Local and Foundation Funding	* Currently in very early stages	8				
NS- 8	2	Research and actively monitor trends in storm events, stream flow and other conditions affecting hydrology and water	DOP	BDC, FEMA, MDE, MDNR, MEMA, NGOs, State Agencies, Waterfront Partnership	Flooding Precipitation Variability	Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Currently in early stages	8				
NS- 8	3	Update flood maps to reflect changing risk associated with climate change.	DOP	BDC, FEMA, MDE, MDNR, MEMA, NGOs, State Agencies, Waterfront Partnership	Flooding	Short	<ul style="list-style-type: none"> Federal Grants State Grants Local Grants 	* Implemented/On-going	8				
NS- 8	4	Continuously improve and enhance flood vulnerability data	DOP	BDC, FEMA, MDE, MDNR, MEMA, NGOs, State Agencies, Waterfront Partnership	Flooding	Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Currently in mid-stages	12				
NEW 2018 DP3 ACTION NS- 8	5	Pursue grants and technical assistance to conduct hydrology and hydraulic studies on flood prone areas within the city, to include Maiden's Choice Branch, when and where feasible	MOEM	DOT, DPW	Flooding	Long	FEMA grants, State Grants	* New					
PS-1: Strengthen emergency preparedness coordination between local government, NGOs, and private entities by updates to the City Emergency Operations Plan (EOP) and related Emergency Support Functions (ESF) (Lead Agency: MOEM)													
PS- 1	1	Identify and develop a common database and communications technology that all city government agencies and departments should utilize for hazard information, preparedness and response	MOEM	MOE, DOT, BCHD, County Governments, DOP, MDH, MOIT, PSC	All	Short	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Currently in early stages. Currently maintain watch lists for communications during emergencies. MOEM implementing the new Code Red mass notification system that all city agencies will have access to and participating in the open data committee.	11				
PS- 1	2	Ensure consistency and integration with existing and future response plans within and between agencies	DOP/ MOEM	BCHD, County Governments, DOP, MDH, Humane Society, MOIT, PSC	All	Ongoing		* Currently in mid-stages MOEM looking at regional plans as part of the current Emergency Operations Plan (EOP) update and will also integrate the hazard ranking from 2018 DP3 in the EOP update.	9				

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PS- 1	4	Coordinate outreach efforts of the Mayor's Office of Emergency Management, Mayor's Office of Neighborhood and Constituent Services and Baltimore City Health Department to leverage messages related to all-hazards emergency preparedness, response and recovery	MOEM	BCFD, BCHD, BCPD, Community Groups, County Governments, DOP, MDH, Humane Society, MOEM, MOIT, MON, PSC	All	Medium	<ul style="list-style-type: none"> State Grants Local Grants Foundation Grants 	The coordination of outreach efforts of the Mayor's Office of Emergency Management, Mayor's Office of Neighborhood and Constituent Services and Baltimore City Health Department to leverage messages related to all-hazards emergency preparedness, response and recovery is ongoing. A great recent example of this level of interagency coordination is our integrated outreach to communities during the pandemic. Another great example was a combined canvassing effort in SW Baltimore on Frederick Avenue in July with OEM, BCFD, BCHD, and DOP.	11				
PS- 1	5	Continue to identify and improve coordination with Key Partners. Develop strong working relationships with local experts to provide technical assistance to refine and improve city government emergency preparation	MOEM	BCHD, County Governments, DOP, MDH, FEMA, MDE, MDNR, MEMA, MOIT, PSC	All	Ongoing	<ul style="list-style-type: none"> State Grants Local Grants Foundation Grants 	* Currently in mid-stages MOEM currently partnering with several key partners through: LEPC, Homeland Security Preparedness Committee (HSPC), BUASI, Downtown Business Partnership, Waterfront Partnership and many others.	11				
PS- 1	6	Review and improve specific response plans contained in the EOP and related ESFs that relate to extreme weather events (snow, heat, flood, wind, electrical outages, and other hazard events)	MOEM	BCHD, County Governments, DOP, MDH, Humane Society, MOIT, PSC	All	Ongoing	<ul style="list-style-type: none"> State Grants Local Grants Foundation Grants 	* Currently in mid-stages The city EOP is currently in revision and will use data from the city mitigation plan update to inform our hazards section.	7				
PS- 1	7	Ensure equipment purchases and communication systems are compatible across agencies and jurisdictions	PSC / MOEM	BCHD, County Governments, DOP, MDH, Humane Society, MOEM, MOIT, PSC	All	Ongoing	<ul style="list-style-type: none"> Federal Funding State Funding Local Funding 	* Currently in very early stages	10				
PS- 1	8	Meet with Baltimore City animal rescue and care shelters to further develop their internal plans for animal's health and safety during and after a hazard event	BCHD	BCHD, DOP, MDH, Humane Society, MOIT, PSC	All	Ongoing	<ul style="list-style-type: none"> Federal Funding State Funding Local Funding 	*Mid-stages	9				
PS- 1	9	Ensure all animal rescue and care shelters located within the floodplain are provided the support to apply for and obtain funds to relocate	BCHD	BCHD, County Governments, DOP, MDH, MDH, Humane Society, MOIT, PSC	flooding Coastal Hazards	Ongoing	<ul style="list-style-type: none"> State Grants Local Grants Foundation Grants 	*Advanced stages	8				
PS- 1	10	Facilitate the sharing of hospital-based best practices and resources with Baltimore City hospitals to foster community resilience to climate change	BCHD	BCHD, DOP, MDH, Humane Society, MOIT, PSC	All	Ongoing	<ul style="list-style-type: none"> Private funding 	* Still pending	7				
PS-2: Develop a Hazard Awareness Program (Lead Agency: MOEM)													
PS- 2	1	Create a standardized early warning system for members of the public and educate them on actions they should take when alarm sounds	MOEM	BCHD, MDH, DOP, MDH2E, MEMA, MOEM	All	Short	<ul style="list-style-type: none"> Local Funding 	* Currently in early stages	10				
PS- 2	2	Evaluate and improve community health center strategies for communicating with patients during an emergency	BCHD/ MOEM	BCHD, MDH2E, MEMA, MOEM	All	Ongoing	<ul style="list-style-type: none"> Private funding 	* Still pending MOEM constantly providing information to the community on communicating during emergencies through our preparedness section.	12				
PS- 2	5	Hold climate specific seminars, in partnership with MDH2E and MHA, for hospital emergency and sustainability managers	BCHD	BCHD, MEMA, MOEM	All	Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Currently in very early stages	11				
PS-3: Designate community leaders and organizations that can assist and provide support during hazard events (Lead Agency: MOEM)													
PS- 3	1	Prior to a hazard event, identify lead contacts serving vulnerable populations and coordinate actions to maximize safety and information sharing	MOEM	BCFD, BCHD, BCPD, Community Groups, DOP, HABC, Hospitals, MOEM, MON	All	Ongoing	<ul style="list-style-type: none"> Community Development Block Grant Program (CDBG) 	* Currently in early stages MOEM works with agencies that serve vulnerable populations, such as the Mayor's Commission on Disabilities.	12				
PS- 3	2	Develop a community group coordination plan and implementation guide	MOEM	BCFD, BCHD, BCPD, Community Groups, DOP, HABC, Hospitals, MOEM, MON	All	Medium		* Currently in very early stages New MOEM Preparedness Director is taking the lead on this and has already gathered many community contacts.	7				
PS- 3	3	Identify and evaluate plans already in place and work to improve utilization of community based leaders to assist in preparedness and response	MOEM	BCFD, BCHD, BCPD, Community Groups, DOP, HABC, Hospitals, MOEM, MON	All	Ongoing (as community leaders and groups change)	<ul style="list-style-type: none"> State Grants Local Grants Foundation Grants 	* Currently in early stages. The city has established Resiliency Hubs to accomplish this exact purpose.	12				
NEW 2018 DP3 ACTION PS- 3	4	Develop training and guidance documents for Resiliency Hub Leaders that detail the scope of services (include checklists and instructions for opening, running, and closing)	DOP	BCHD, MOEM, Community / Faith Based groups	All	Short	FEMA grants, State Grants	A grant from the Pew Charitable Trusts from 2018-2020 enabled us to hire consultants to develop training and guidance documents (in the form of a Situation Manual) specifically for the Resiliency Hubs that included resource checklists, contact lists, supplies lists, and a fill-in opening, running, and closing document that could be customized by each Hub.					
NEW 2018 DP3 ACTION PS- 3	5	Increase number of Resiliency Hubs	DOP	BCHD, MOEM, Community / Faith Based groups	All	Medium	FEMA grants, State Grants	The number of Community Resiliency Hub partner organizations has increased from 5 in 2018 to 15 in 2021.					
NEW 2018 DP3 ACTION PS-3	6	Initiate community resiliency planning, outreach, and support	DOP	MOEM, BCHD, Community and Faith Based Groups	All	Ongoing	FEMA grants, State Grants	The initiation of community resiliency planning, outreach, and support is ongoing. A grant from the Pew Charitable Trusts from 2018-2020 enabled us to hire consultants and build out our community resiliency planning outreach and support, particularly of Resiliency Hubs, by hosting a scenario-based training workshop in October 2019. Crisis/hazard support for communities and community organizations has been ongoing throughout the pandemic.					
PS-4: Integrate climate change and natural hazards planning into all City and community plans (Lead Agency: MOEM)													
PS- 4	1	Develop guidelines to include proactive resilience planning into plan development process	DOP / DHCD	BCHD, MOEM, State and Federal Agencies	All	Ongoing, Medium	<ul style="list-style-type: none"> Community Development Block Grant Program (CDBG) 	* Currently in very early stages	5				
PS- 4	3	Partner with Maryland Department of Health or other pertinent entity to develop institutional checklist and materials for health care specific resilience plans	BCHD	BCHD, DOP, MOEM, State and Federal Agencies	All	Ongoing, Medium	<ul style="list-style-type: none"> Private funding 	* Still pending	8				
PS-6: Anticipate and address potential disease outbreaks caused by extreme weather events and changing climatic conditions (Lead Agency: BCHD)													
PS- 6	1	Support studies of heat and flood related vector borne diseases in the Baltimore the region based on changing temperature and moisture	BCHD	BCHD, CDC, MDH, MDNR, MEMA, MOEM, State Agencies	Flooding Extreme Heat	Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Currently in mid stages BCHD has developed an Infectious Disease Response Plan.	8				

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PS- 6	2	Evaluate existing programs that detect disease outbreaks to determine their flexibility to respond to new conditions	BCHD	BCHD, CDC, State Agencies	All	Ongoing		* Currently in mid stages Surveillance systems are identified in the BCHD Infectious Disease Response Plan, but have not been formally evaluated. Most surveillance systems are managed by the state MDH, not at the local level.	6				
PS-7: Protect Baltimore residents from the effects of hazard events and plan for more frequent hazard instances (Lead Agency: MOEM)													
PS- 7	1	Re-evaluate and update existing heat alerts, advisories, and updates to healthcare and emergency service providers	MOEM / BCHD	BCFD, BCHD, BCPD, BCRP, MDH, Licenses and Permitting, MDE, MOEM, Healthcare providers	Extreme Heat	Short	<ul style="list-style-type: none"> State Grants Local Grants Foundation Grants 	* Currently in early stages Inspection and maintenance- evaluate need for and availability of procurement agreements may be the best option The Baltimore City Code Red Extreme Heat Plan is updated annually to ensure existing alert strategies are adequate, and to keep cooling center location and hours current. Recommend to change this action to ongoing (column M).	6				
PS- 7	2	Ensure that residents and visitors have access and transportation to cooling centers during extreme heat events	MOEM / BCHD	BCHD, BCRP, Community Groups, MDH, Licenses and Permitting, MDE, MOEM, Transportation partners	Extreme Heat	Ongoing	<ul style="list-style-type: none"> State Grants Local Grants Foundation Grants 	*Currently in mid-stage Some transportation to cooling centers is available for Seniors through the CARE taxi voucher program, but not specifically for other populations. Funding is a limiting factor for this action item.	7				
PS- 7	3	Communicate with city agencies at the start of the Heat Season on how to protect city staff working outside	MOEM / BCHD	BCFD, BCHD, BCPD, BCRP, MDH, Licenses and Permitting, MDE, MOEM, Agencies with outdoor workers	Extreme Heat	Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Currently in early stages The Code Red Extreme Heat Plan does not currently include steps to ensure agencies protect their workers.	7				
PS- 7	5	Include information about Code Red in the event permitting process, and incorporate language that allows BCHD to cancel outdoor events	MOEM / BCHD	BCHD, BCRP, Licenses and Permitting, MDE	Extreme Heat	Medium, Ongoing	<ul style="list-style-type: none"> State Grants Local Grants Foundation Grants 	* Still pending BCHD will work with partners to ensure that extreme heat information is available during the event permitting process.	7				
STATE ACTION PS-7	6	STATE ACTION - Work with Regional, State and Local partners to improve air quality and reduce respiratory illnesses	MDE	BCHD, BCRP, Licenses and Permitting, MDE	Extreme Heat	Medium, Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Currently in early stages	9				
PS- 7	7	Create and implement programs to manage combined health impacts of heat and air pollution	BCHD	BCHD, BCRP, MDH, Licenses and Permitting, MDE	Extreme Heat	Medium, Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Currently in early stages There is no funding in BCHD identified for this project	4				
NEW 2018 DP3 ACTION PS- 7	8	When and where feasible pursue grants to complete any project eligible under FEMA's Hazard Mitigation Unified Guidance and its addendum that will contribute to the reduction of hazardous conditions in the city	MOEM	All city agencies	Flooding	Ongoing	FEMA grants, State Grants	* New					
PS-8: Conduct climate, resiliency, and emergency planning education and outreach (Lead Agency: MOEM)													
PS- 8	1	Incorporate environmental health and climate change into curriculum at schools, universities and health care facilities	BCHD	BCHD, DNR, DOP, DPW, MDH, MOEM, MOIT, MON, Hospitals	All	Ongoing	<ul style="list-style-type: none"> Community Development Block Grant Program (CDBG) Federal Funding Sources 	* Still pending	8				
PS- 8	6	Create curriculum for hospitals to teach communities about climate change as part of hospital community benefits programs	BCHD/ MOEM	BCHD, DNR, DOP, DPW, MDH, MH2E, MOEM, MOIT, MON, Hospitals	All	Medium	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Still pending	8				
PS- 8	7	Utilize existing preparedness messaging to include information on universal precautions to insect-borne and other infectious diseases	MOEM / BCHD	BCHD, DNR, DOP, DPW, MDH, MH2E, MOEM, MOIT, MON, Hospitals	All	Short	<ul style="list-style-type: none"> State Grants Foundation Grants 	* Currently in mid-stages. BCHD developed messaging in 2016 and 2017 for protection from mosquito-borne diseases including Zika; this information is posted on the BCHD website. Resource limitations and competing priorities have limited this item from being addressed further.	6				
PS-9: Improve awareness and education about the importance of flood insurance and preparation for Baltimore citizens (Lead Agency: FEMA/MEMA)													
PS- 9	1	Create an educational program centered on flood hazards, coastal construction practices and evacuation procedures	DOP / MOEM	Community Groups, DHCD, MDH, FEMA, MEMA, MOEM, MON, NFIP, NGOs, MOEM	Flooding Coastal Hazard	Short	<ul style="list-style-type: none"> Housing Recovery Funding NFIP 	* Currently in early stages	11				
PS- 9	2	Encourage owners of properties to purchase flood insurance and improve policyholder awareness at time of sale or renewal	DOP	Community Groups, DHCD, MDH, DOP, FEMA, MEMA, MOEM, MON, NFIP, NGOs, MOEM	Flooding Coastal Hazards	Ongoing	<ul style="list-style-type: none"> Housing Recovery Funding NFIP 	* Currently in mid-stages	11				
PS- 9	4	Identify programs and grants that assist citizens in purchasing flood insurance and making flood proofing changes	DOP	Community Groups, DHCD, MDH, FEMA, MEMA, MOEM, MON, NFIP, NGOs, MOEM	Flooding Coastal Hazards	Medium	<ul style="list-style-type: none"> Housing Recovery Funding NFIP 	* Currently in very early stages	9				
PS- 9	5	Develop an annual newsletter to inform and remind owners of property in the floodplain about flood insurance and flood proofing activities they should undertake	DOP	Community Groups, DHCD, MDH, FEMA, MEMA, MOEM, MON, NFIP, NGOs, MOEM	Flooding Coastal Hazards	Short, Ongoing	<ul style="list-style-type: none"> State Grants Foundation Grants 	* Currently in very early stages	5				
PS- 9	7	Require a flood disclosure form, and distribution of floodplain awareness educational information as part of lease agreements for commercial / residential properties and ensure distribution as tenants change	HCD / MOEM / DOP	Community Groups, DHCD, MDH, FEMA, MEMA, MOEM, MON, NFIP, NGOs, MOEM	Flooding Coastal Hazards	Ongoing	<ul style="list-style-type: none"> Federal Grants State Grants Foundation Grants 	* Still pending	11				
PS-10: Increase Baltimore's Food Security (Lead Agency: DOP)													
PS-10	1	Incorporate Baltimore's food policy initiative into planning efforts and double the size and number of food producing community gardens by 2025	DOP	MDA, Urban Farms and Community Gardens (P&P and CGRN)	Flooding Precipitation Variability	Ongoing, Long	<ul style="list-style-type: none"> Community Development Block Grant Program (CDBG) State Grants Foundation Grants 	* Currently in advanced stages BFPI has become much more integrated into the Office of Sustainability at-large and hazard and resilience planning, and have done an assessment of the Resiliency Hubs.	11				

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STATE ACTION PS-10	2	STATE ACTION - Increase food distribution infrastructure and local food aggregation to link regional and local food producers to local distributors	MD Agriculture	BOS, DOP, MDA, Urban Farms and Community Gardens (P&P and CGRN)	Precipitation Variability	Ongoing, Long	<ul style="list-style-type: none">Federal GrantsState GrantsFoundation Grants	* Currently in very early stages	9				
PS-10	4	Develop a food security plan for Baltimore	DOP	DOP, DOP, MDA, Urban Farms and Community Gardens (P&P and CGRN)	Precipitation Variability	Ongoing, Long	<ul style="list-style-type: none">Federal GrantsState GrantsFoundation Grants	* Currently in mid-stages BFPI convened an Emergency Food Working Group that created a plan for Food Access during Incidents and Disasters for inclusion in the EOP, and BFPI now staffs the EOC during major events. New protocols are in place with schools and rec centers to feed kids after emergencies. A list is maintained of which stores have back up power.	11				
PS-10	5	Increase land under cultivation for commercial urban agriculture	DOP	MDA, Urban Farms and Community Gardens (P&P and CGRN)	Precipitation Variability	Ongoing, Long	<ul style="list-style-type: none">Federal GrantsState GrantsFoundation Grants	* Currently in early stages	11				
NEW 2018 DP3 ACTION PS- 10	6	Increase the amount of land permanently secured for food production, from community gardens, market gardens, to commercial urban agriculture	DOP	MDA, Farm Alliance, BCRP, Baltimore Green Space, Urban Farms and Community Gardens	Flooding	Ongoing	FEMA grants, State Grants	* Currently in early stages					
NEW 2018 DP3 ACTION PS- 10	7	Implement the Plan for Food Access During Incidents and Disasters	DOP	MOEM, Emergency Food Working Group partners	All	Ongoing	FEMA grants, State Grants	* Currently in advanced stages					
NEW 2018 DP3 ACTION PS- 10	8	Increase food system resilience over the long-term	DOP	CLF, MOEM	All	Ongoing	FEMA grants, State Grants	* Currently in early stages					