

# HISTORIC PRESERVATION & EMERGENCY MANAGEMENT



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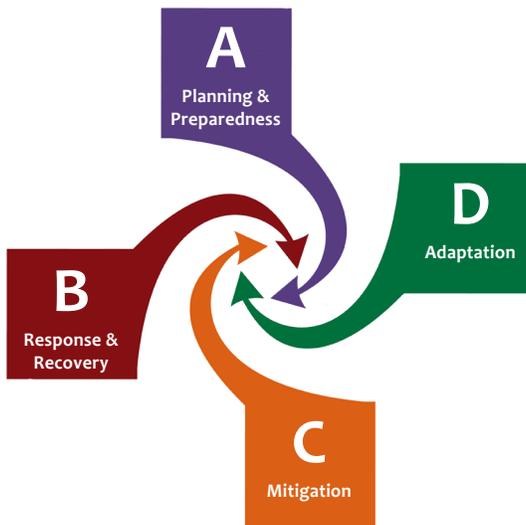


Figure 2.1 - The Emergency Management Cycle, modified to include adaptation.

## INTRODUCTION

Federal, state, and local governments engage in emergency management to reduce the loss of life, minimize the effects of damage and loss, and protect the community from threats and hazards, including flooding. Although local governments may not initially prioritize historic properties and cultural resources in flood mitigation planning, the protection and recovery of these special places can be critical to restoring a community's well-being and quality of life in the aftermath of a disaster. Moreover, historic properties are often integral to a community's economic success, fueling heritage tourism, anchoring Main Street commercial districts, and providing attractive housing stock. Although planning for historic and cultural resources can include objects, sites, and structures such as bridges, as well as archeological remains, this *Guide* primarily addresses emergency management as it relates to flooding and its effects on historic buildings and districts.

### KEY QUESTION:

**What is the emergency management cycle?**

The Emergency Management Cycle consists of four phases: planning/preparedness, response, recovery, and mitigation. Given the increasing threat of frequent, intense precipitation and sea level rise, this *Guide* includes climate adaptation, as related to flood mitigation, as an additional phase of the cycle. The cyclical nature of emergency management means that it never ends: at any point in the cycle, there are always actions to be taken. Between disasters, local governments should be planning and preparing in case a disaster strikes, and conducting mitigation activities to enable the community to withstand and recover from hazards like flooding. When a disaster strikes, or is predicted to strike, communities should prepare, respond, recover, and conduct mitigation based on lessons learned during the response and recovery. In this way, a community constantly strives to become more resilient and learns to adapt to changing threats and new hazards.

### KEY QUESTION:

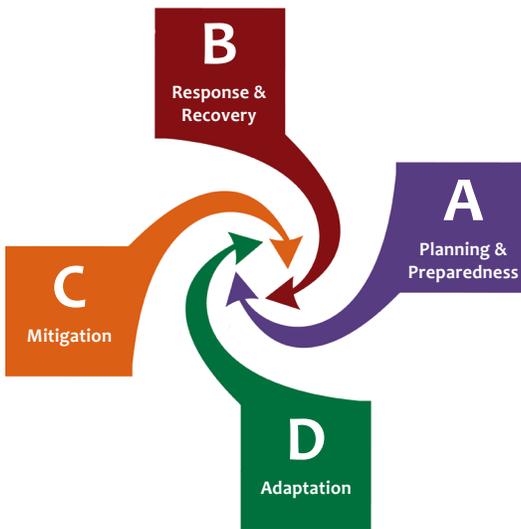
**Who is responsible for emergency management?**

Many agencies at all levels of government contribute to, and are involved in, the Emergency Management Cycle, including planning, transportation, public works, health and human safety, and housing and community development. An office of emergency management typically leads local the process, in concert with a team of individuals

representing diverse skills and expertise. State and federal agencies, as well as preservation organizations, private sector partners, and non-governmental organizations, can provide additional support and technical assistance. This chapter of the *Guide* provides options and recommended strategies for planners and others interested in addressing historic preservation goals and protecting historic properties within the emergency management context. *(Refer to Key Players in Emergency Management and Their Roles, page 2.77.)*

**KEY QUESTION:**

***How does emergency management relate to historic properties?***



**A**  
 Planning & Preparedness  
 Identify Historic Properties  
 Identify Flood Risk  
 Establish Preservation Priorities  
 Prepare Emergency Response Plan

## A. PLANNING & PREPAREDNESS

### KEY QUESTION:

**What local government planning efforts can help protect historic properties threatened by hazards?**

### COMMUNITY HAZARD MITIGATION PLANNING FOR HISTORIC PROPERTIES

The City of Tulsa, Oklahoma, and the City of Annapolis, Maryland, were the first communities to conduct hazard mitigation planning for historic properties following the FEMA model. Annapolis’s Weather It Together project serves as a model for other local governments in Maryland.

*Planning is the starting point of the Emergency Management Cycle and the first step in protecting historic properties from flooding.* The planning process allows a community to evaluate the level of threat and ways to reduce harm from flooding (flood mitigation), consider the efficacy and potential impact of mitigation options on historic properties, select appropriate mitigation measures, and develop a prioritized plan for implementation within a specific timeframe. This process can be completed via a hazard mitigation plan as well as through other local planning efforts. (Refer to *Evaluate Options for Planning*, page 2.4).

Recognizing the importance of historic properties to the character and quality of life in communities throughout the country, the Federal Emergency Management Agency (FEMA) produced a publication titled *Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning* (FEMA, 2005), on which this *Guide* draws. While not intended to replace FEMA’s guidance, this *Guide* contains information based on the planning experience of the Maryland Historical Trust (MHT) as well as Maryland-specific resources. Users should consult both documents.

*The planning process also provides an opportunity for communities to evaluate their historic preservation, zoning, and building regulatory framework and implement improvements to better protect historic properties.* Protection can be preventative, such as developing design guidelines for property owners to improve their flood resilience in a manner that is sensitive to the historic integrity of the community. (Refer to *Develop Design Guidelines for Flood Mitigation*, page 2.55.) Protection can also be responsive, by establishing protocols to protect historic properties following a flood event. (Refer to *Emergency Operations Plans*, page 2.8.)

A local government may initiate the planning process in response to known threats (often highlighted by a disaster and recovery) or include planning for historic properties within a mandated plan update. Although this *Guide* recommends working within the hazard mitigation

planning process described below, local governments should consider all options for planning and select the type that best meets their needs.

## A.1 EVALUATE OPTIONS FOR PLANNING

*Although the hazard mitigation planning process can be challenging to navigate, it is the most effective tool for community planners and historic preservation commissions to use to prepare for and respond to flooding and natural disasters.* It is critical for the planning team to ensure that all planning efforts support rather than contradict each other; for example, the local hazard mitigation plan must link into the State Hazard Mitigation Plan, and hazard mitigation plans and preservation plans should have consistent recommendations. (Refer to *Hazard Mitigation Plans, page 2.4, and Preservation Plans, page 2.7.*) Wherever possible, hazard mitigation and other local plans should tie into program requirements for funding incentives, such as the Maryland Department of Housing and Community Development’s Sustainable Community Plans.

In some cases, independently or as a result of a local planning effort, a community may elect to update its regulatory framework for planning or create more specific plans for disaster response and recovery or climate adaptation. (Refer to *Implement Protective Actions, page 2.52; Emergency Operations Plans and Climate Adaptation Plans, page 2.8; Planning for Response & Recovery, page 2.35; and Adaptation, page 2.67.*) Because these targeted efforts require their own planning and public outreach, it makes sense to streamline processes as much as possible, so that input for all measures is obtained as part of cohesive planning for flood resilience.

### a. Hazard Mitigation Plans

The State of Maryland and all twenty-three of its counties, as well as the City of Annapolis, the City of Baltimore, and the Town of Ocean City, have FEMA-approved hazard mitigation plans. **Local hazard mitigation plans are prepared every five years by a team, usually including paid consultants under the direction of city or county staff; jurisdictions within a county have representatives on the team.** Through the process, the team identifies vulnerable populations, properties, and infrastructure, and prioritizes mitigation projects to reduce those vulnerabilities. These mitigation projects then serve as the foundation for funding requests for subsequent planning projects (e.g, documentation and risk assessment of vulnerable historic resources) or mitigation projects which may alter landscapes, infrastructure, or structures to reduce flood vulnerability in a community. **The Maryland State Hazard Mitigation Plan includes projects related to historic properties and archeological sites which could be revised to fit local needs and included in a local hazard mitigation plan.**

At a minimum, local hazard mitigation plans in Maryland address risks from flooding, coastal hazards (coastal storms,



## Integrating Historic Property and Cultural Resource Considerations Into Hazard Mitigation Planning

State and Local Mitigation Planning How-To Guide

FEMA 386-6 / May 2005



Figure 2.2 - FEMA 386-6 is a useful tool for integrating historic and cultural resources into the hazard mitigation planning process. However care should be used to ensure the requirements of recent legislation are considered as part of the implementation process, including the Biggert-Waters Flood Insurance Reform Act of 2012 and the Homeowners Flood Insurance Affordability Act of 2014. (Refer to *National Flood Insurance Program, page 1.17.*)



Figure 2.3 - Local Hazard Mitigation Plan Guidance pamphlet is available on the MEMA website.



Figure 2.4 - The City of Baltimore’s Disaster Preparedness and Planning Project Plan (DP3) is a proactive approach to planning that both addresses existing hazards and prepares for the predicted effects of climate change. The plan addresses infrastructure, buildings, natural systems, and public services and includes strategies and actions to improve resiliency and sustainability while adapting for anticipated future conditions. DP3 also takes another step beyond traditional hazard mitigation plans by requiring city departments to align capital improvement project requests with plan actions and strategies.

storm surge, hurricanes, tropical storms, Nor’easters, sea level rise, and coastal erosion, where applicable), winter storms, tornadoes, and wind. This *Guide* focuses on flood hazards, although many of the tools and processes can be adapted for other hazards. Flooding is often accompanied by secondary hazards such as contamination, fires, and high wind, particularly in areas vulnerable to hurricanes; however, this *Guide* does not address secondary impacts.

If the planning team elects to work within the hazard mitigation planning framework, information and recommended actions can be prepared as an annex, or standalone component, of the larger hazard mitigation plan, or as a chapter within the plan. There are advantages and disadvantages to each option. **The annex approach, recommended by this Guide, allows greater focus on the protection of historic resources and a greater opportunity for input from the preservation planner and the public.** However, the chapter approach ensures the integration of historic resource protection within the larger community plan and ensures consideration of preservation-friendly recommendations within that context, potentially providing greater community buy-in. Although the annex approach is recommended here, the team should ensure that the recommendations are well supported within the larger planning process, and both options should reinforce and not conflict with actions identified in the remainder of the hazard mitigation plan.

Draft plans must be reviewed by the Maryland Emergency Management Agency (MEMA) for completeness and consistency with the State Hazard Mitigation Plan. Following MEMA’s approval and prior to local adoption, plans are submitted to FEMA. Approval by FEMA confers eligibility for Hazard Mitigation Assistance Program funding for projects included in the plan. Because communities continuously evolve, due to changes in development, infrastructure, industry, and impacts from hazards and emergency events, local communities are required to update their FEMA-approved hazard mitigation plans every five years to remain eligible for funding. Advocates for historic preservation should take the opportunity to participate in the activities driven by updates on this cyclical basis.

**While participating in the planning process, it is important to keep in mind that there is often tension, and in some cases conflict, between guidance for preservation and for floodplain management, and neither framework mandates that local governments address climate change impacts. (Refer to *The Increasing Threat of Flooding*, page 1.7, *Establish a Timeframe for Planning Goals*, page 2.20, and *Adaptation*, page 2.67.)** In many regards, this *Guide* may help bridge that gap; however, it should be noted that the integration of climate change into planning continues to evolve as predictions improve and best practices emerge.

The order of the mitigation actions presented in Table 5.1 corresponds to the ranking score from high-to-low for each category.

Table 5.1--Mitigation Action Priority Ranking Results

Priority Ranking Category	Mitigation Action / Project Title
HIGH	#1 - Completion of Elevation Certificates for Historic Properties at Risk to Flooding
	#3 - Enhance Maryland Flood Maps ( <a href="http://www.mdfloodmaps.org">www.mdfloodmaps.org</a> )
	#6 - Flood Risk Freeboard Layer
	#8 - Conduct Survey & Evaluation of Historic Properties and other Cultural Resources in Coastal High Hazard Areas - Zones AE & VE
	#10 - Incorporation of HAZUS Runs (Planning and Recovery efforts post disaster) for <a href="http://www.mdfloodmaps.org">www.mdfloodmaps.org</a>
	#11 - Vulnerability Assessment - Hurricane Wind Enhanced HAZUS
	#12 - Review and Revise the Mitigation Advisory Committee (MAC) Priority Ranking System to include consideration and prioritization of SRL and RL related projects
	#13 - Obtain Elevation Certificates for State Facilities in Special Flood Hazard Areas & Integrate all Elevation Certificates into Online System ( <a href="http://www.mdfloodmaps.org">www.mdfloodmaps.org</a> )
	#14 - All Hazards Risk, Mitigation & Resiliency Outreach
	#15 - Coastal Restoration to Mitigate Coastal Hazards for Vulnerable Communities
	#18 - Increase opportunities for formal and informal communication and adaptation planning, facilitate the exchange of ideas within the Chesapeake Bay watershed, and pilot green/grey infrastructure to prepare for and respond to climate impacts to vulnerable jurisdictions.
	#20 - Maryland Repetitive Loss (RL) & Severe Repetitive Loss (SRL) Property Inventory Update
	#22 - Technical Assistance to Identify, Address, and Incorporate Coastal Hazards into Local Planning
	#24 - Table Top Exercises Prior to Flood Event / Hazard
#26 - Mobile Lidar Capture	
#30 - Inventory Susceptible Wells & Retrofit with Protection	
#33 - Roadway Flooding Vulnerability Assessment	

Figure 2.5 - Hazard Mitigation Plans should include prioritized mitigation actions. This excerpt from the Maryland Hazard Mitigation Plan identifying high-priority mitigation actions, including one related to historic preservation: #8 - Conduct Survey & Evaluation of Historic Properties and other Cultural Resources in Coastal High Hazard Areas - Zones AE & VE. (Refer to Flood Insurance Rate Maps, page 1.15.)

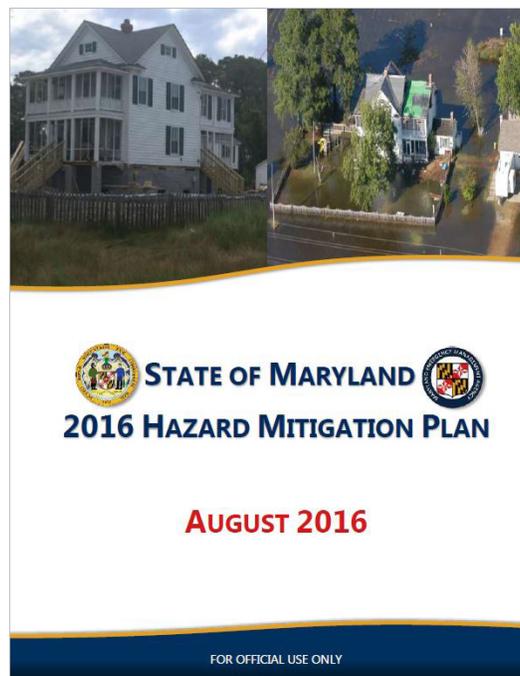


Figure 2.6 - State of Maryland: 2016 Hazard Mitigation Plan.

## b. Other Local Plans

In addition to a hazard mitigation plan, communities can also use other existing planning processes to foster preparedness. Comprehensive plans, preservation plans, and several smaller but nonetheless important initiatives (e.g, the development of design guidelines for flood mitigation) can augment an existing hazard mitigation plan. **It is critical that all plans for an area share consistent goals and strategies.** (Refer to *Develop Design Guidelines for Flood Mitigation*, page 2.55, and *Implement Protective Actions*, page 2.52.) A review of the community’s flood risk should also be reviewed by looking at a community’s Flood Insurance Risk Map (FIRM), the Maryland Commission on Climate Change’s Updating Maryland’s Sea-level Rise Projections (MCCC, 2013), and any other GIS mapping that the State or community has developed to identify additional areas of risk and projected risk. (Refer to *The Increasing Threat of Flooding*, page 1.7 and *Flood Insurance Rate Maps*, page 1.15.)

### i. Comprehensive Plans

Through comprehensive plans and plan updates, counties and municipalities develop a framework for future growth and development, illustrating current and potential land use and demographics. Although historic preservation is not a mandated element, local governments can use comprehensive plans as tools for guiding how communities

and historic properties can adapt to natural hazards, climate change, and increasing vulnerability to flooding. Jurisdictions are required to protect streams and their buffers, the Special Flood Hazard Area (SFHA), habitats of threatened and endangered species, steep slopes, wetlands, and agricultural and forest lands intended for resource protection or conservation. *(Refer to Flood Insurance Rate Maps, page 1.15.)* Like hazard mitigation plans, comprehensive plans set goals, objectives, and actions related to floodplain management and, when included, historic properties.

When possible, comprehensive plans should identify historic properties as valuable community assets and identify actions for their long-term protection, with attention being given to flood vulnerability. Including specific recommendations such as updating regulations, creating streamlined review processes to expedite response and review of historic properties impacted by flooding, or completing research and survey documentation of historic properties threatened by flooding can provide a strategic framework to meet a community's goals for protection. *(Refer to Document & Assess Flood Risks to Historic Properties, page 2.21, Create an Expedited Review Process for Disaster Response, page 2.36, Modify Zoning Ordinance, page 2.54, and Modify Building Code Requirements, page 2.58.)*

The comprehensive planning process may provide a more accessible forum for community participation than the hazard mitigation planning process. To the degree possible, the team should follow the planning steps described in this section *(Planning & Preparedness)*, to ensure consistency with the hazard mitigation approach. Because both comprehensive plans and hazard mitigation plans establish the framework for a community's future historic property and floodplain management, the goals, objectives, and strategies in both documents should be consistent and reinforce each other. The varying cyclical updates, five years for hazard mitigation plans and ten years for comprehensive plans, allow a community to regularly evaluate, anticipate, and align goals. These goals should include working with adjacent communities who share similar flood risks to develop recommendations for shared, large-scale mitigation projects such as shoreline protection. Working together will reduce the likelihood that mitigation in one community will exacerbate flooding in an adjacent community.

## ii. Preservation Plans

Typically developed by preservation planners and/or historic preservation commissions, preservation plans describe a local government's historic and cultural resources, identify preservation goals, and recommend actions. Just as preservation elements are not mandated in a comprehensive plan, preservation plans are not mandated, nor do they have specific content requirements.

Like comprehensive plans, preservation plans generally describe the existing conditions and regulatory framework and identify preservation goals and strategies to achieve those goals. As such, they are flexible and can be adapted to address local needs and recommendations. If adopted by a municipality or county, preservation plans can have regulatory authority similar to comprehensive plans.

As with comprehensive plans, preservation plans can be used to set goals, objectives, and actions specifically related to flood vulnerability, hazard mitigation, and historic properties. The preservation planning team should utilize the planning process described in this *Guide* to the degree that makes sense for the community and its resources. Counties and municipalities without a separate preservation plan should rely on their comprehensive plan to address local historic preservation concerns, either via a preservation element or integrated into the plan.

### iii. Emergency Operations Plans

All levels of government have Emergency Operations Plans, which describe how to respond to disasters and emergency events. An Emergency Operations Plan defines the preparedness and emergency management activities necessary for a jurisdiction to respond to specific hazards or threats; assigns responsibility to individuals and organizations for accomplishing actions during the emergency; sets forth lines of authority and defines organizational relationships; lays out how all actions will be coordinated during the response; describes how people and property are protected; identifies resources available within the jurisdiction and by agreement with other jurisdictions; and reconciles requirements with other jurisdictions who may also be responding to the hazard or threat. The plans also contain a series of annexes that describe the methods that should be followed for critical operation functions during emergency operations and assigns responsibility for those methods to governmental agencies and departments. The terminology for these annexes is Emergency Support Annex at the federal level, State Coordinating Function at the state level, and Recovery Support Function at the local level. Historic buildings, other cultural resources, and natural resources are typically addressed jointly in a single annex. (Refer to *Response & Recovery*, page 2.39.)

### iv. Climate Adaptation Plans

The Maryland Commission on Climate Change has developed a Climate Action Plan (MCCC, 2008) and a Greenhouse Gas Emissions Reduction Act of 2009 Plan (MCCC, 2015) to guide the State's adaptation efforts. Agencies involved in climate adaptation efforts report each year on implementation; however, these efforts are always evolving. Although the State offers tools for climate and resilience planning and has developed *Infrastructure Siting and Design Guidelines*

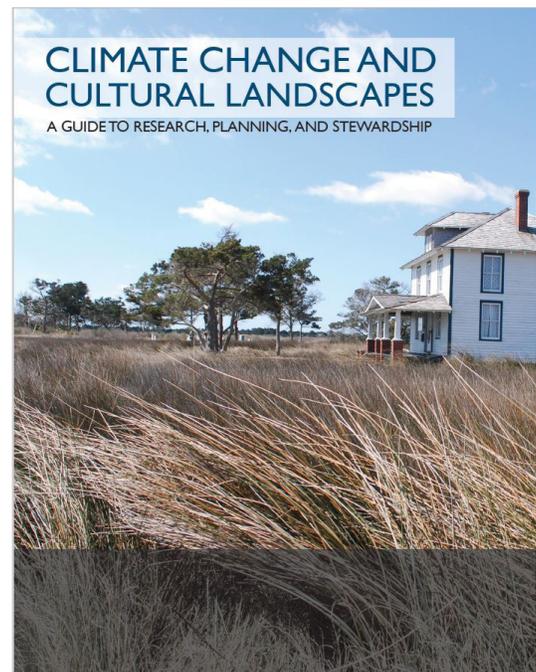


Figure 2.7 - *Climate Change and Cultural Landscapes: A Guide to Research and Planning Stewardship*.

(MCCC, 2014) for its own investments, it has not issued formal guidance for jurisdictions wishing to pursue climate adaptation. (*Refer to The Increasing Threat of Flooding, page 1.7.*) In time, climate adaptation may necessitate multi-county or regional approaches. This Guide encourages consideration of climate change effects related to flooding, such as sea level rise and increased precipitation, as part of the hazard mitigation planning process. (*Refer to Adaptation, page 2.67.*)

## A.2 RECRUIT A TEAM

Flood mitigation and historic preservation are both specialized fields, and they overlap little in their purpose and daily function. Historic preservation professionals or advocates, for example, are rarely represented in the typical hazard mitigation planning process led by emergency management. Until integration of these disciplines becomes more widespread and established, planners and emergency managers must collaborate and tap a range of specialized individuals to identify issues and develop creative solutions to meet a community's needs. Although it is ideal to have a full team in place at the beginning of the process, it is more likely that the process will begin with a small group that will expand as goals are formalized and progress made.

### KEY QUESTION:

**How can preservation planners and advocates participate in the local hazard mitigation planning process?**

*To engage in the process, preservation planners, members of the historic preservation commission, and/or representatives of local preservation groups should request the opportunity to participate as members of the technical team for the next hazard mitigation plan update.* It may not be logistically possible for the local emergency management office to include all interested parties on the technical team, and participants who are included should be prepared for the significant time commitment required. The preservation advocates on the technical team should also be sure to coordinate and share information with groups that are interested but unable to participate.

As an alternative, local historic preservation commissions, preservation planners, or advocacy groups could consider developing a separate hazard mitigation plan for cultural resources, either as an official addendum to the local hazard mitigation plan or as guiding recommendations within another plan. (*Refer to Other Local Plans, page 2.6, and Annapolis Hazard Mitigation Plan for Cultural Resources, page 2.16.*)

Valuable team members will hail from many different disciplines, experiences, and points of view. Although communities will all have different needs and available expertise, the range of experts and advocates for the preservation team can include (in no particular order):

- Elected officials with an interest in historic preservation;
- Historic preservation commission members;
- Preservation planners or planners with an interest in preservation;



Figure 2.8 - Local participation should be included throughout the Emergency Management Planning process. Annapolis, Anne Arundel County. (Source: Alicia Moran.)

- Local government personnel responsible for review and permitting;
- GIS mapping specialists;
- Emergency managers;
- Floodplain administrators;
- Professional preservation architects, landscape architects, and archeologists;
- Representatives of local historical and archeological societies, private museums, and archives;
- Business representatives from historic commercial districts;
- Representatives from public historic sites, parks, and “friends” groups;
- Civic association representatives from designated residential districts – making a special effort to include traditionally marginalized communities;
- Preservation advocacy organizations;
- Tourism bureau representatives;
- Maryland Historical Trust (the State Historic Preservation Office);
- Local Heritage Area;
- Main Street program managers, staff, or volunteers; and
- Local colleges and universities with programs related to historic preservation or cultural heritage.

As part of the planning process, local team members can help identify tools and strategies to address the long-term protection of flood-prone historic properties within the jurisdiction. To give just a few examples, they can:

- Evaluate the current regulatory framework and existing support for historic properties and floodplain management (*refer to Modify Zoning Ordinance, page 2.54, and Modify Building Code Requirements, page 2.58*);
- Identify ways to integrate flood mitigation for historic properties into community planning goals (*refer to Evaluate Options for Planning, page 2.4*);
- Review existing data about historic properties and flood vulnerability to identify areas where information is lacking (*refer to Identify Known Historic Resources, Flood Hazards & Capabilities, page 2.13*);
- Evaluate implementation of goals identified in the Community Rating System (CRS) and potentially revise local zoning and building codes to reduce floodplain development and, thereby, flood impacts (*refer to Community Rating System sections, page 1.25, and Participate in the Community Rating System, page 2.59*);
- Develop a framework of preferred options for landscape improvements appropriate to local conditions to mitigate flooding (*refer to Landscape Improvements, page 3.20*);
- Develop design guidelines for flood mitigation which are appropriate to the local character (*refer to Develop Design Guidelines for Flood Mitigation, page 2.55*);
- Prepare information on protective measures for historic properties and distribute to owners in advance of a flood as part of preparedness activities; and
- Develop a process for coordinated local response to protect historic properties following a flood (*refer to Planning for Response & Recovery, page 2.35*).

The local team can also play an important role in developing and implementing a public engagement strategy. (*Refer to Engage the Public, page 2.17.*)

Forming the planning team and beginning the planning process can happen either in conjunction with or prior to the update to a community's hazard mitigation plan. ***Even if the local plan update was recently completed and did not include historic properties, it is nonetheless advantageous to move forward with planning for historic and cultural resources to get "ahead of the game."*** Ideally, when it is time for the next plan update, the planning team will have information in hand and public sentiment behind the inclusion of cultural resources in the hazard mitigation plan.



Figure 2.9 - The entire town of Whitehaven is located within the Special Flood Hazard Area. The town is a National Register Historic District with individual properties are designated on the Maryland Inventory of Historic Properties have Preservation Easements with the MHT.

### A.3 IDENTIFY KNOWN HISTORIC RESOURCES, FLOOD HAZARDS & CAPABILITIES

To get a better sense of how to prioritize its efforts, a community seeking to protect historic properties from flooding should begin with an analysis of its current data, programs, resources, and potential threats. This initial analysis – the starting point for any planning process – will help the team:

- Establish parameters for planning, including the type of plan(s) as well as mitigation and funding opportunities to pursue;
- Direct available energy and resources towards the overall goal of protecting historic properties;
- Reveal deficiencies in current information, processes, and resources and indicate opportunities for improvement; and
- Identify potential partners who can assist in various aspects of the work – such as the MHT, which can provide guidance on planning strategies and priorities for data collection and, in some cases, provide funding.

The initial analysis will identify both strengths and weaknesses. For example, communities that have already experienced flooding might have a robust hazard mitigation plan or floodplain management plan and dedicated resources towards flood mitigation. Other communities may not yet have experienced damaging floods but may have a vested interest in protecting historic districts that fuel their tourism-based economies or establish their sense of place. By gathering this initial information, community funding and personnel efforts can be directed toward areas that need improvement, and the team can decide how best to integrate historic preservation into emergency management and vice versa. The initial analysis should include the following topics:

#### a. Existing Plans

As part of its outreach to state and local partners, the team should collect planning documents and maps to help understand what guidelines and strategies have already been established regarding the identification and protection of historic properties. Although relevant documents will vary depending on the type of plan being pursued, they can include:

- State and local hazard mitigation plans;
- Floodplain management plans;
- Disaster response and recovery plans;
- State and local historic preservation plans and preservation elements within comprehensive plans;
- Heritage Area Management Plans;
- Comprehensive plans;
- Community or site-specific master plans;
- Economic development plans, including for Main Streets and Arts and Entertainment Districts; and
- State and local transportation plans, including Scenic Byways.

## RESOURCES TO IDENTIFY HISTORIC PROPERTIES VULNERABLE TO FLOODING

Preliminary data on historic properties should be collected, as appropriate, from the entities described below.

- **Local Historic Preservation Commissions** – Local historic preservation commissions often maintain inventories of individual properties and historic districts in their jurisdiction, supplemental information about properties included in state or federal records, and information about the type and level of regulation of each property. To regulate properties for design review or other purposes, local preservation commissions must designate properties according to local criteria; the Maryland Historical Trust does not track which properties are locally designated. These designations will inform what can and cannot be done for mitigation, under the existing regulatory framework.

**Note:** Local preservation commissions are not required under state law and, if established, serve a single jurisdiction. A municipality working on a hazard mitigation plan will have, at most, a single commission in its jurisdiction, and the county commission should also be included, if one exists. For a county-level plan, it is important to consult with all preservation commissions within the county's boundaries, as well as with the county commission.

- **Maryland Historical Trust** – As the State Historic Preservation Office, the Maryland Historical Trust (MHT) maintains the Maryland Inventory of Historic Properties (MIHP), a repository of information on districts, sites, buildings, structures, and objects of known or potential value to the prehistory and history of the state. The MIHP includes data on more than 13,000 archeological sites and 40,000 historic and architectural resources. These records are merely informational but often serve as the basis for local preservation planning and inventories.

MHT also maintains records for Maryland properties listed on or eligible for listing on the National Register of Historic Places. In the event of a state or federal undertaking, including mitigation efforts funded by FEMA, MHT consults with the state or federal agency to avoid, minimize, or mitigate harm to these historic properties through the historic property review process. Medusa, the MHT's online cultural resource information system, has GIS-linked records for properties included in the MIHP as well as National Register listed and eligible properties.

- **Local and Regional Planners** – Many communities without a formal historic preservation commission maintain information about and plans for historic properties. Historic resources valued by the community are sometimes identified in comprehensive plans, small area plans governing specific sites or similar planning initiatives. (*Refer to Other Local Plans, page 2.6.*)
- **Local Historical Societies and Museums** – Many local historical societies and some regional museums maintain archives including photographs and other records about historic sites and properties, as well as oral histories and documents related to storm and flooding events.
- **Maryland Heritage Areas Program** – Thirteen Heritage Areas operate throughout the state, encouraging residents and tourists to experience the unique stories and physical characteristics that define Maryland's communities and countryside. Each Heritage Area operates according to a management plan that identifies tourism themes and properties with heritage tourism potential (for example, tobacco barns in Southern Maryland or the story of religious freedom on the Eastern Shore).
- **Local, State & Federal Agencies with Community Cultural Resources** – A variety of agencies collect and maintain information regarding historical and cultural resources. For example, through the State Highways Administration, Maryland's Department of Transportation (MDOT) runs the state's Scenic Byways Program. As with Heritage Areas, the state's 18 scenic byways encompass landscapes, viewsheds, and historically and culturally significant places that may not be documented elsewhere.

## b. Potential Levels of Flood Vulnerability

An area's flood vulnerability will vary based upon geographic location, geology, hydrology, hydraulics, and the specific types and locations of historic properties. Infrastructure stability and capacity, including transportation, utilities, and water supplies, as well as sewage treatment and stormwater management, will influence both risk and recovery. As part of the initial analysis, each community should gather preliminary information on flood risks, with the understanding that levels of risk may be unique to each resource. (Refer to *Chapter 1: Flooding & Floodplain Management*.)

*Although not required, FEMA and the State of Maryland encourage local communities to consider climate projections for sea level rise, increased precipitation, and other factors, depending on the location and the available timeframe for planning.* In 2016, the Maryland Commission on Climate Change recommends planning for a relative sea level rise of 2 feet or more by 2050 and 4.1 feet or higher by 2100. Data layers for sea-level rise are available online via the Maryland Department of the Environment (MDE). (Refer to *The Increasing Threat of Flooding, page 1.7, Establish a Timeframe for Planning Goals, page 2.20, and Adaptation, page 2.67*.)

The Maryland Department of the Environment's Flood Risk Application contains GIS map layers with data on floodplains, storm surge, sea level rise, coastal erosion, and other natural hazards related to flooding. The local floodplain administrator or the contractor updating the local hazard mitigation plan are also resources for aid in using the Flood Risk Application or mapping the intersection of historic properties with flood hazards. (Refer to *Evaluating a Property's Flood Risk, page 1.22, and Document and Assess Flood Risks to Historic Properties, page 2.21*.)

## c. Historic Properties Vulnerable to Flooding

As a first step, the planning team should overlay a map of known historic properties on a map of the areas determined to be vulnerable to flooding. Known historic properties include those determined eligible to for listing on, or listed on, the National Register of Historic Places, properties documented in the Maryland Inventory of Historic Properties (MIHP), properties identified in local inventories (via local preservation planners or historic preservation commissions), and properties identified as culturally or historically significant in existing planning documents. Unfortunately, many communities in Maryland have incomplete or outdated information regarding historic properties, so additional documentation is often necessary as part of the planning process. (Refer to *Document & Assess Flood Risks to Historic Properties, page 2.21*.)

*Ideally, data on historic properties will be comprehensively linked to Geographic Information System (GIS) mapping*

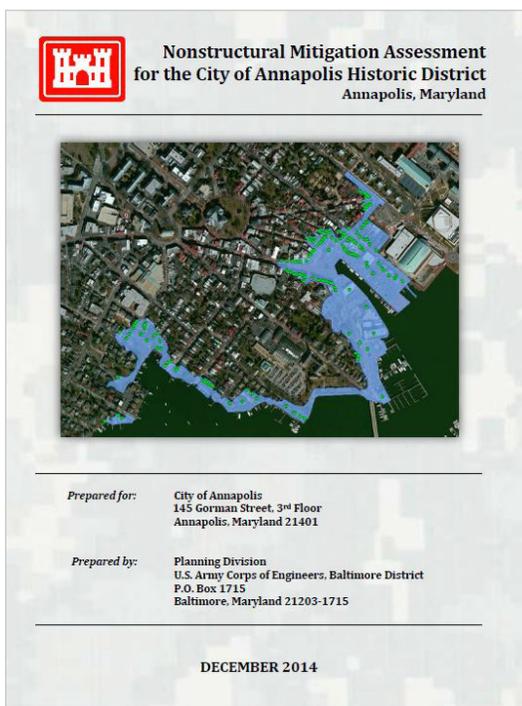


Figure 2.10 - The U.S. Army Corps of Engineers completed a assessment of flood risk for the City of Annapolis in December 2014.

software; communities without GIS capability may have written documents or survey files on historic properties. In either case, the community should compare its local information with the data and documentation available through Medusa, the MHT's online cultural resource information system. Documentation of individual properties' flood vulnerability may or may not exist at the beginning of the process; Elevation Certificates and related information should be gathered as part of this initial analysis. (Refer to *Evaluating a Property's Flood Risk*, page 1.22.)

#### d. Preservation Regulatory Framework

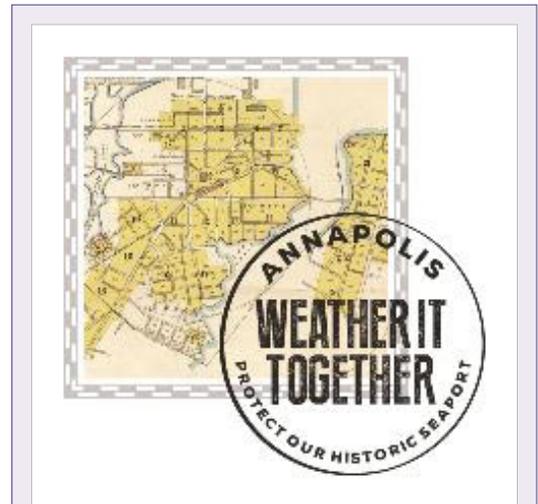
Some communities have a regulatory framework with a strong preservation focus, supported by citizens and local authorities, while other jurisdictions have limited local recognition of and support for their historic and cultural properties. Starting from a position where preservation is locally valued will help prioritize mitigation efforts for historic properties. A strong framework may include: Certified Local Government (CLG) designation; an active historic preservation commission, as well as a robust historic district ordinance with a permit review process; active preservation non-profits and advocates; and/or a preservation plan or component of a master plan, as well as supporting directives such as preservation design guidelines. (Refer to *Implement Protective Actions*, page 2.52, and *Develop Design Guidelines for Flood Mitigation*, page 2.55.)

#### e. Availability of Personnel and Financial Resources

Financial resources and knowledgeable, committed preservation and emergency management personnel are necessary for the successful protection of historic properties. Advocacy is crucial to securing funding in the context of competing local interests. Authorities will be more inclined to dedicate financial resources if the preservation is visibly supported by a dedicated team of community leaders and volunteers. Ideally, preservation-friendly local officials can advise or participate in the planning team. (Refer to *Recruit a Team*, page 2.9.)

#### f. Degree of Community Support

Political will often reflects the degree of existing community support for an issue and can make the difference between the protection or loss of historic properties. Some communities have a good understanding of citizen support or lack thereof; others will need to research public opinion as part of the public engagement strategy. At the outset, the planning team should evaluate what is known about community sentiment, consider opportunities for engagement and potential partners for engagement, and identify an outreach strategy for marginalized or vulnerable communities that may be difficult to reach. (Refer to *Engage the Public*, page 2.17.)



#### ANNAPOLIS HAZARD MITIGATION PLAN FOR CULTURAL RESOURCES

As part of its hazard mitigation plan for cultural resources, the City of Annapolis created the Weather It Together brand and logo to help raise awareness about the threats of flooding to historic properties in the Colonial port and encourage public participation in the planning process. The plan – a national model for the protection of historic resources from sea level rise, subsidence, and flooding – has utilized surveys, town hall meetings, charrettes, tours, and other forms of public engagement under the Weather It Together logo. When completed, the plan will identify and recommend mitigation measures to protect the historic and architectural integrity of the capital city.

Annapolis invites other jurisdictions to learn from its experience and to adapt the Weather It Together logo and branding as part of their own planning efforts. The MHT has adapted the tagline and logo for its statewide programs related to historic preservation and emergency management.



Figure 2.11 - Developed by Marin County, California, “Game of Floods” can help planners and the general public understand flood risks and trade-offs in hypothetical scenarios.

#### A.4 ENGAGE THE PUBLIC

Successful plans require robust public input and support. *Engagement strategies should attempt to reach the widest range of affected citizens and stakeholders, and special consideration should be given to communities that may be particularly vulnerable to flooding or may have historically or culturally significant properties that have not been adequately documented (for example, areas that have suffered from disinvestment or have a high population of low-income, minority, or elderly residents).*

Ongoing outreach can educate citizens about the potential effects of flooding and the potential effects of mitigation measures on historic properties that matter to them. It can extend beyond the hazard mitigation planning process to address special initiatives, as well as planning and preparedness issues relevant to the community. *In addition to education, public engagement provides a valuable opportunity for the community to provide feedback and share knowledge about places that are important to them but that may not be included in any inventories.* This feedback may help to identify significant properties that meet the criteria for listing in the National Register of Historic Places or for local designation, or those that are culturally valuable to the community, with or without designation.

*When developing a public engagement strategy, the planning team should clearly define goals, and structure the outreach to inform citizens/stakeholders of the planning process at regular intervals.* The planning team might consider the key moments when public input will be valuable, such as in the identification of

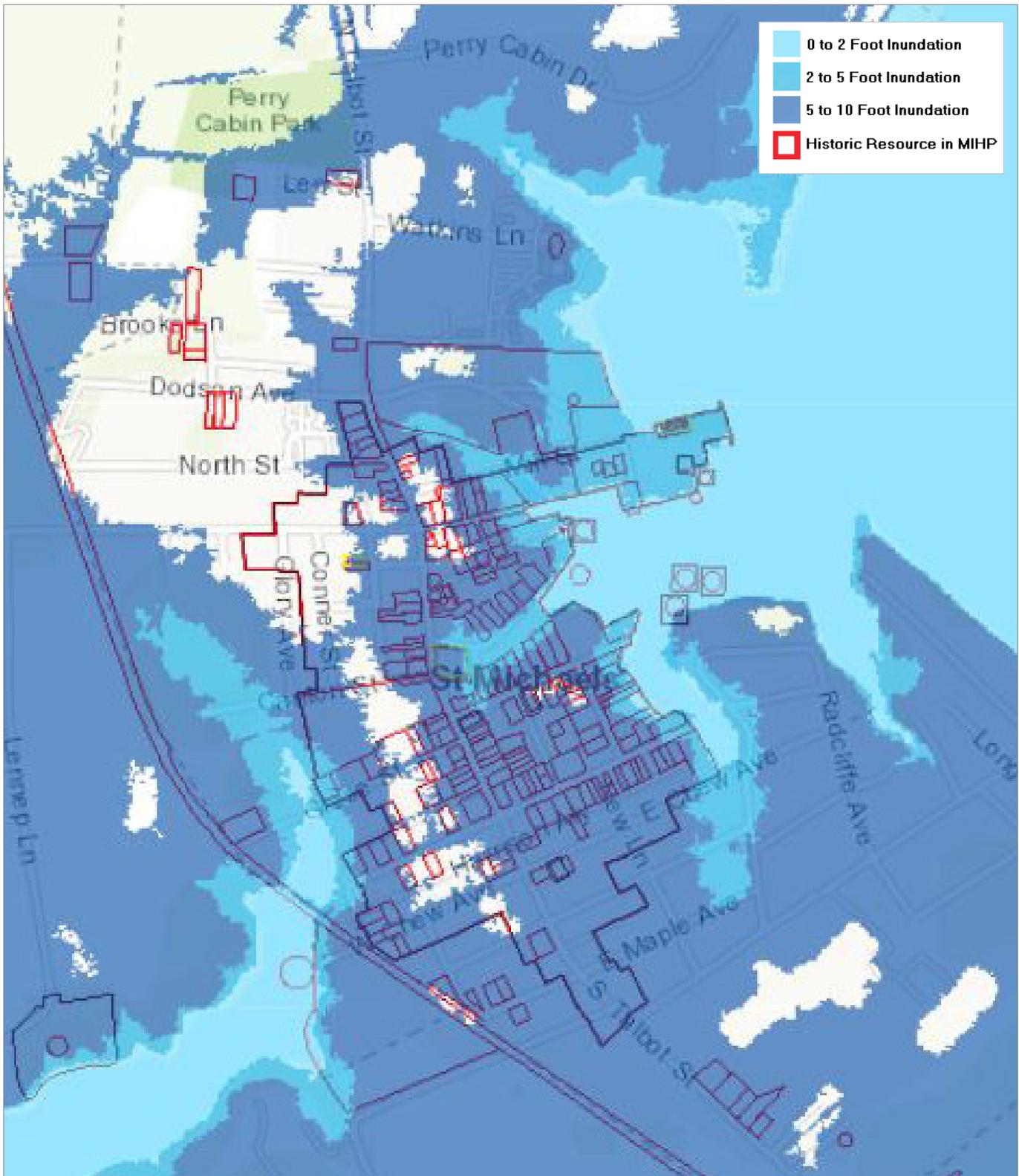


Figure 2.12 - This map depicts the projected impact of sea-level rise on historic resources in St. Michaels, Talbot County. The Maryland Commission on Climate Change recommends planning for a relative increase in sea level in the Chesapeake Bay of 2 feet by 2050. (Refer to *The Increasing Threat of Flooding*, page 1.7.)

local priorities, and when public updates are appropriate. (*Refer to Establish Local Preservation Priorities, page 2.28.*) The team can then develop an overall schedule with meeting dates and subjects, allowing community members to plan ahead. The schedule should be adaptable and flexible to accommodate change and incorporate new opportunities as they arise.

Public engagement for hazard mitigation planning can take various forms, including meetings, mailings, questionnaires, websites, social media, surveys, tours, email blasts, news articles, video streaming, pamphlets, list-serves, workshops, and conferences. To maximize participation, the planning team should consider creative strategies to increase attendance: holding meetings in various locations, scheduling outside of standard work hours, ensuring adequate access by public transportation, providing interpretation for non-English speaker, providing food, or including child-friendly activities, and/or childcare. Funding opportunities may be available specifically for engagement, separate from sources dedicated solely to hazard mitigation planning.

Some issues to consider regarding public engagement include:

- What are the characteristics of typical flooding in the community? Is it getting worse? Are adjacent communities addressing similar issues? Is there an opportunity to work together?
- Have historic resources already been identified? Are they vulnerable to flooding? Have citizens been given the opportunity to weigh in on what is locally important?
- What is the community's threshold for risk? What is its relationship to water?
- What defines the sense of place? How can the community change and still protect what's meaningful? Are all neighborhoods and all citizens represented in this evaluation?
- On what is the community willing to compromise in terms of historic integrity, and how does that influence preferences for mitigation actions? What can be compromised and what cannot be compromised to maintain the sense of place?
- Are individual property owners implementing mitigation projects? How are they making their choices? Is there information to assist them? What are the impacts on the property's historic integrity? Do these projects have impacts on neighboring properties?
- Should community-wide and building-specific mitigation be considered separately? Is there a benefit in encouraging specific property mitigation projects to supplement or enhance community-wide projects?

After reviewing responses to these questions, a community will be in a better position to develop mitigation goals, strategies, and actions that meaningfully incorporate the preservation and protection of historic properties. Ideally, however, engagement should reach beyond the formal hazard mitigation meeting process. Community updates can be a regular agenda item in a monthly or

quarterly meeting, such as a historic preservation commission, historical society, business association or civic association meeting, or incorporated into a public gathering or event.

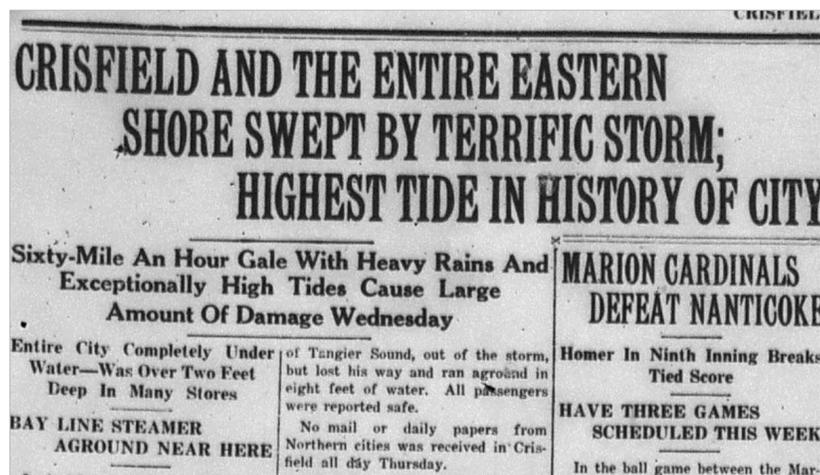


Figure 2.13 - Crisfield Times coverage of an unnamed storm, August 25, 1933.

## A.5 ESTABLISH A TIMEFRAME FOR PLANNING GOALS

As noted previously, each community must identify flood hazards, including where floods are likely to occur; assess the vulnerability of the community and in some cases, specific properties; and identify mitigation goals, strategies, and actions to reduce the impact of flooding. FEMA's Flood Insurance Rate Maps (FIRMs), the most important baseline for flood management, provides information about the most vulnerable areas within a community's floodplain based only upon historical data. (Refer to *Flood Insurance Rate Maps*, page 1.15.) Communities that wish to include projections for sea level rise and storm surge in their vulnerability assessments can utilize the Maryland Department of the Environment's DFIRM (Digital Flood Insurance Rate Maps) mapping tools. Official guidance does not currently exist to help communities plan for increased precipitation over time, but representatives from MEMA and the Maryland Department of the Environment (MDE) can provide community assistance for consideration in their planning efforts.

Because of the anticipated change in flood risk over time, a community should establish timeframes for planning that are accepted by both governmental officials and citizens and allow for realistic, achievable implementation goals. If the planning timeframe is too long, it may be perceived as a reason to pass the problem on to future property owners or generations. If too short, the timeframe may not allow for adequate long-term protection, thereby requiring ongoing planning and implementation of additional mitigation to reduce future threats. To encourage the implementation of mitigation measures by private property owners, communities might consider a timeframe of 30 years, the length of most homeowners' mortgages. A 30-year timeframe would also allow communities to plan for the additional 2 feet recommended to accommodate anticipated sea level rise by 2050. (Refer to *Potential Levels of Flood Vulnerability*, page 2.15.)

## A.6 DOCUMENT & ASSESS FLOOD RISKS TO HISTORIC PROPERTIES

### KEY QUESTION:

What are planning “best practices” for historic properties threatened by flooding?

To address the flood risk to historic properties, it is critical to understand their location, characteristics, and flood vulnerability. *Using the information collected at the beginning of the planning process combined with feedback from stakeholders and the public, the team can develop a plan to document and assess flood risks to historic properties following the steps outlined below. (Refer to Identify Known Historic Resources, Flood Hazards & Capabilities, page 2.13.) Ultimately, all vulnerable historic and cultural resources should be identified as part of the hazard mitigation planning process.* When sufficient local government resources are not available, volunteers or partnerships with other groups, including non-profit entities, can assist in documentation efforts. If necessary, these efforts can start small and be built up over a number of years.

### a. Examine the Community’s Relationship to Water

In planning for the future, it is important to consider historic and contemporary relationships to water on the community, district, and neighborhood levels. Layered with social, cultural, historical, and physical dimensions, these relationships can inform an understanding of historic resources in context. *Although this Guide focuses on historic buildings, it is important to acknowledge that many kinds of historic and cultural resources reflect a community’s relationship to water.* These resources can include wharves and docks, lighthouses, cultural landscapes, archeological sites, and cemeteries, as well as intangible heritage associated with water-based industries, recreation or other activities. To the extent possible, all aspects should be considered both in the planning process and in evaluating mitigation options. To better understand how to protect historic properties for the future, it may be beneficial to review the following factors.

- **Past Flood and Storm Events.** With many of Maryland’s historic communities located adjacent to waterways, it may be useful to gather information about previous flood or storm events (for example, high watermarks demarcating the depth of floodwaters from previous flood events), specifically noting the physical effects of these events on the landscape and buildings over time. *During the public engagement and documentation process, communities may wish to solicit “storm stories” or compile oral histories from the public about flooding and storm events and resulting community changes.*
- **Source of Flooding.** In assessing a community’s physical relationship to water, it is important to keep in mind that waterways were often altered over time by a change in course or by being covered over. In many cases, covering over or developing streams and wetlands will contribute to flooding, and restoring these areas can contribute to mitigation efforts. *(Refer to Mitigation, page 2.51.) Historic maps and atlases can provide clues to how development responded to those*



Figure 2.14 - Chesapeake & Ohio Canal Cushwa Warehouse (constructed circa 1790 – 1810) located at the canal’s edge has historical high watermarks visible in white block on the face of the building noting the depth of flooding from five food events from the mid-19th to early-20th century. Williamsport, Washington County.

*changes, and how this evolution is (or is not) visible in the current environment.* Of course, the relationship to water will continue to change, particularly in locations vulnerable to sea level rise. Therefore, it is also pertinent to consult mapping products that depicted the projected sea level rise for a community (e.g, MDE’s Flood Risk Application with Maryland Sea Level Rise Vulnerability layer added to viewer).

- **Living with Water.** An understanding of past mitigation or adaptation measures can suggest options for the future. Research should include identifying unofficial adaptations by residents to the realities of living with persistent flooding, flooding events, and/or climate change. Analyzing a community’s maritime heritage to ascertain how industry and recreational activities have changed and adapted can also inform decisions about mitigation options. *(Refer Adaptation, page 2.67, and Chapter 3: Selecting Preservation-Sensitive Mitigation Options.)*
- **Community Infrastructure.** In any given community, an infrastructure concern or other community-wide issue affecting numerous properties may guide the mitigation timeline. For example, access to fresh water, sewage treatment, electricity, and roadways are critical for human habitation. If access to these resources is compromised long-term, people will be unable to remain in the community. Understanding which systems are vulnerable to events, as well as the timeframe and likelihood of restoration, may dictate a timeframe for planning and/or place system upgrades at the top of the priority list for mitigation. *(Refer to Adaptation, page 2.67.)*

#### **ADAPTATION STRATEGIES: DORCHESTER COUNTY**

In Dorchester County, some residents have constructed low berms around their property to keep nuisance flooding out. Others have built mounds to park their cars. Some pre-position their cars when they know a high tide will cover a roadway, or they modify their work schedule so they are not commuting during high tides. These are all forms of adaptation that are not due to any policy by the local government.

### **b. Identify Gaps in Historic Property Documentation and Vulnerability Assessments**

As a first step in identifying gaps, the planning team should review records in the Maryland State Department of Assessment and Taxation (SDAT) database to get a rough estimate of properties over 50 years old (a common threshold for National Register eligibility) and then compare these findings to existing data on historic properties. *(Refer to Identify Known Historic Resources, Flood Hazards & Capabilities, page 2.13.) Although the properties identified through SDAT may be dated incorrectly and will not necessarily meet criteria for historic significance, this comparison will help give a sense of possible locations for additional properties for study.* Through public outreach and further investigation, the planning team can compile additional information about historic or culturally significant properties that may not have previously been documented. *(Refer to Engage the Public, page 2.17.)* The team may also wish to gather additional information on known historic properties if the existing documentation is out of date or insufficient.

Once the team has located potentially unrecorded properties, the next step is to overlay this data set preferably through

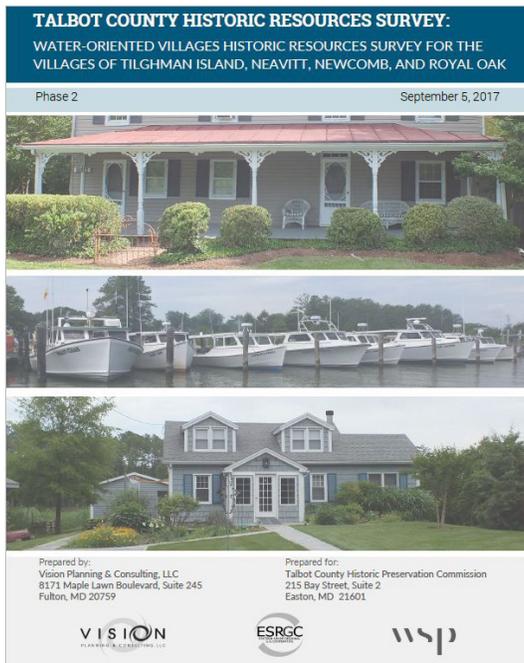


Figure 2.15 - Talbot County completed a Historic Resources Survey for water oriented villages in 2017.

GIS mapping, with the known historic properties and Flood Insurance Rate Maps to see what additional properties fall within the SFHA or other areas vulnerable to storm surge or sea level rise. (Refer to *Identify Known Historic Resources, Flood Hazards & Capabilities*, page 2.13.) This mapping exercise is a good point to begin setting goals for documentation and risk assessment, and even envisioning potential mitigation actions.

**The most useful assessments evaluate flood vulnerability on a structure-by-structure basis, not just via FIRMs and other generalized mapping tools.** This is particularly true for historic buildings, which frequently have unique materials and characteristics. Since it provides information on a building's vertical and horizontal location in the floodplain, an Elevation Certificate provides the data needed to determine flood risk; however, it does not account for how the building is constructed, nor whether the building is historic. (Refer to *State & Local Floodplain Regulations & Ordinances*, page 1.18, and *Evaluating a Property's Risk*, page 1.22.) Not all buildings in a flood-prone community or within the SFHA will have completed Elevation Certificates. It is likely that the community will also need to conduct vulnerability assessments for historic structures as part of its planning process. The local floodplain administrator retains copies of completed Elevation Certificates.

### c. Document and Assess the Vulnerability of Historic Properties

**Ideally, for the purposes of hazard mitigation planning, a consultant team will document historic properties and assess flood vulnerability at the same time.** Not only does this streamline the planning process: local planners rarely have the time and/or expertise required to undertake this step on their own. Hazard mitigation planning funds can support surveys of historic properties if those surveys also identify hazard risks and recommend mitigation measures, or if they include completing Elevation Certificates for historic structures. Likewise, preservation planning funds, such as those available through the Certified Local Government program, administered by the MHT, can be used to conduct vulnerability assessments in tandem with historic property documentation.

The combined documentation/assessment process includes many of elements familiar to preservation professionals but also includes information about the likelihood and potential financial impact of floods. In addition to location within the flood-prone area, other factors can influence a property's degree of risk and possible level of flood damage, including a building's horizontal and vertical location within the floodplain and its foundation type, all of which are used in determining a property's flood insurance rate and premium. (Refer to *Evaluating a Property's Flood Risk*, page 1.22.) If possible, separate assessments should be performed for each historic resource on a property (i.e, the main house and the carriage house). In completing hazard

assessments for individual buildings, there are several areas, outlined below, which call for particular attention.

- **Building Condition.** Identify whether the building is in good, fair, or poor condition. Buildings in fair to poor condition are likely to also be poor candidates for mitigation, as they are not likely to be able to withstand the modifications needed to protect the building from flooding. For example, a building in poor condition may not be able to withstand being raised on cribbing in preparation for the construction of an elevated foundation. Maintenance needs should be identified, since a well-maintained property can provide the best investment to reduce the potential damage from hazards such as flooding. *(Refer to Encourage Property Maintenance, page 2.52.)*
- **Building Foundation Design and Materials.** Historically, wood framed buildings in flood-prone areas were supported by brick piers, elevating the building's structure and contents above flood level and allowing ventilation and drying of the soil below. Similarly, basements and crawlspaces were constructed with unfinished rubble walls and dirt floors to allow slow outward water seepage and promote drying after a flood. Vulnerability to flood damage can increase with changes to historic materials and building construction, such as the solid infilling of the area between piers and the finishing of basements. This can be exacerbated by the replacement of historic materials with newer materials, which can be more susceptible to damage from flood water than traditional historic materials. Basements now sometimes include building systems and appliances, which tend to be highly vulnerable to water damage, resulting in a higher level of risk during a flood event.

The vulnerability assessment should also note the presence of potentially damage-resistant historic materials such as wood, lime based mortar or plaster, stone, and brick, as

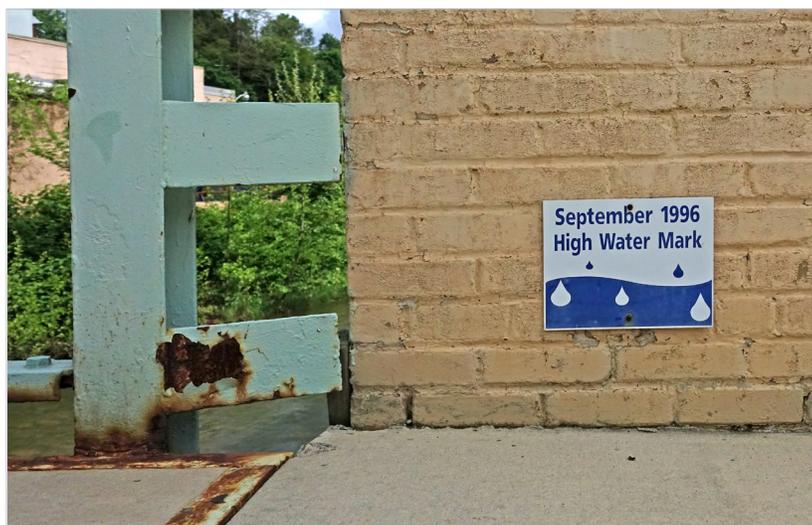


Figure 2.16 - Understanding prior flood history is critical in assessing vulnerability. Westernport, Allegany County.

**KEY QUESTION:**  
**What resources has the State of Maryland developed to assist?**

MARYLAND HISTORICAL TRUST  
 ARCHITECTURAL SURVEY FORM FOR  
 HAZARD MITIGATION PLANNING

Name of Property: \_\_\_\_\_ Date of Visit: \_\_\_\_\_  
 Property Address: Street and Number \_\_\_\_\_  
 City/Town \_\_\_\_\_ County \_\_\_\_\_  
 Owner(s): \_\_\_\_\_  
 Owner Address: Street and Number \_\_\_\_\_  
 City/Town \_\_\_\_\_  
 State/ZIP \_\_\_\_\_  
 Owner Type:  Public  Private  Both  
 Telephone: \_\_\_\_\_ Email: \_\_\_\_\_  
 Inspector's Name(s): \_\_\_\_\_ Telephone: \_\_\_\_\_  
 Inspector's Affiliation: \_\_\_\_\_ Email: \_\_\_\_\_

A. STRUCTURE TYPE, USE, AND PREVIOUS SURVEY  
 Category (e.g. bldg., site, object): \_\_\_\_\_ Current function: \_\_\_\_\_  
 MIHP Number \_\_\_\_\_ Listed in National Register?  No  Yes  
 In Listed National Register Historic District?  No  Yes Contributing Resource?  No  Yes  
 Historic District Name: \_\_\_\_\_  
 Local District Name: \_\_\_\_\_

B. STANDING STRUCTURES ON THE PROPERTY  
 Please list the MIHP Number (if applicable), number, type and condition of standing structures on the property.  
 Number of Standing Structures: \_\_\_\_\_  
 1. \_\_\_\_\_ (main structure) \_\_\_\_\_  
 2. \_\_\_\_\_ 5. \_\_\_\_\_  
 3. \_\_\_\_\_ 6. \_\_\_\_\_  
 4. \_\_\_\_\_ 7. \_\_\_\_\_

C. GEO-LOCATION  
 Quad attached:  No  Yes Quad Name: \_\_\_\_\_ Quad Scale: \_\_\_\_\_  
 Latitude \_\_\_\_\_ Longitude \_\_\_\_\_

D. LEGAL DESCRIPTION AND PROPERTY VALUATION  
 Tax Map: \_\_\_\_\_ Tax Parcel: \_\_\_\_\_ Tax ID No.: \_\_\_\_\_  
 Market Value (Bldg): \_\_\_\_\_ Valuation Date: \_\_\_\_\_ Total Square Feet: \_\_\_\_\_  
 Square Footage (SF) Estimated?  No  Yes  
 Valuation & SF Source: \_\_\_\_\_

MHT - Architectural Survey Form for Hazard Mitigation Planning, August 2015 Page 1 of 10

Figure 2.17 - MHT has developed an Architectural Survey Form for Hazard Mitigation Planning.

- well as substitute or non-historic materials. Material and equipment damage can result from direct water contact or develop as a secondary effect in the form of mold, mildew, and rust. (Refer to *Wet Floodproofing*, page 3.24.)
- **Prior Flood History.** Documentation of prior flood history at a specific property may be available from several sources, including reports or records from FEMA’s National Flood Insurance Program or a local floodplain administrator; published and unpublished local histories; building department records; historical photographs; and newspaper, newsletter or magazine accounts of flooding. In addition, meeting minutes or treasurer’s reports of significant events can be a good resource for identifying prior flooding for organizations such as religious institutions, house museums, or clubs. (Refer to *Examine the Community’s Relationship to Water*, page 2.21.)
- **Secondary Hazards and Risks.** In locations where flooding is a primary risk, there are often secondary risks associated with a disaster. Coastal storms are often accompanied by high winds, which can result in toppled trees and flying debris, impacting historic properties. Downed electrical lines can result in loss of power and potential fire threat. Fire can also be caused by ruptured gas lines as well as disconnected or damaged appliances and propane tanks.

To document multiple properties within larger areas or districts, MHT has developed a process which combines survey district documentation for the Maryland Inventory of Historic Properties (MIHP) with a hazard mitigation vulnerability assessment. FEMA also provides guidance on conducting a risk assessment for historic properties and cultural resources in its publication *Integrating Historic Property and Cultural Resources Considerations into Hazard Mitigation Planning* (FEMA, 2005).

MIHP documentation can provide the framework for a future National Register historic district nomination, should one be desired. Recording survey districts (a grouping of properties that may have potential for historic designation) also helps identify resources that may be individually eligible for inclusion in the National Register of Historic Places. While MHT must concur on formal eligibility, this information can be used when developing hazard mitigation priorities and as part of the historic preservation review process for federal or state undertakings.

Not every historic property surveyed will meet the criteria for federal or local designation, and in some cases, designation is not desired. Without a formal designation or determination of eligibility for the National Register, or local designation by a Certified Local Government, a property will be treated as “non-historic” and will be required to meet the floodplain regulations if alterations fall under the local government’s definition of “substantial improvements” or “substantial damage.” (Refer to *State & Local Floodplain Regulations & Ordinances*, page 1.18.)



Figure 2.18 - The map generated using the Hazus-MH Riverine flood model indicates this historic house, located on the Eastern Shore, is located outside of the 100-year floodplain, or Special Flood Hazard Area (SFHA).

To access the greatest potential benefits, as well as financial support, a property should be listed on the National Register of Historic Places, either individually or as a contributing resource within a historic district. National Register designation (and local designation, depending on the local regulatory framework) may provide:

- Recognition of what is locally significant, with potentially higher consideration for protection through the hazard mitigation planning process;
- Access to historic preservation funding; and
- Protection through historic preservation project review to minimize historically inappropriate alterations.

As described in *Chapter 1: Flooding & Floodplain Management*, some local governments, via their local floodplain ordinances, do not require historically designated properties to meet all flood-related code requirements. Although this allows the property to retain – at least for the time being – its historic integrity, appearance, materials, and relationship to its context, the property will remain vulnerable to flooding. The exemption also requires property owners to balance the competing needs of preservation and protection. (Refer to *State & Local Floodplain Regulations & Ordinances*, page 1.18.)

Although a comprehensive documentation and assessment is preferable, most communities will not have the resources to address all vulnerable properties as part of a single planning effort. Some information can be gathered by volunteers or preservation professionals, while other information must be completed by trained professionals, who may include architects, structural engineers, civil engineers, hazard mitigation planners, and environmental planners. For communities that are not able to simultaneously identify historic properties and complete vulnerability assessments, a historic resources survey can be completed first, increasing awareness and local appreciation of historic properties while providing the framework for a later assessment. Whenever possible, this information should be integrated into local GIS mapping to open up the most possibilities for analysis and future applications.

#### ESTIMATING ECONOMIC LOSS

Economic losses to historic properties can be estimated using other methods that may depend on the damage a municipality expects to incur. For example, the City of Annapolis planned for a flood event at a height that would damage the first floor of buildings in the flood hazard area. Therefore, the City's formula for calculating building damages was limited to replacement of first floor fixtures and finishes. Other municipalities may want to calculate the total loss of a building, or the building's replacement cost.

#### d. Estimate Economic Losses

One tool that can be utilized to calculate financial impact is FEMA's HAZUS software, which provides models for estimating potential losses for physical damage to buildings and infrastructure, economic losses, and social impacts from earthquakes, tsunamis, floods, and hurricanes utilizing GIS technology. HAZUS estimates are generally provided during the update of a hazard mitigation plan by the contractor who is updating the plan, but they may also be developed by a local government's GIS staff. **Keying historic and cultural property information to a GIS database through a historic resources inventory facilitates the HAZUS documentation process.** (Refer to *Evaluating a Property's Flood Risk*, page 1.22, and Document

& *Assess Flood Risks to Historic Properties*, page 2.21.) It should be noted that the HAZUS software is limited in that it treats all buildings as the same, without accounting for the unique nature of the design, construction, and materials of historic buildings.

Building cost data references can be used to calculate a replacement cost; however, a multiplier should be used to account for the uniqueness of historic buildings (e.g. custom construction; custom fixtures such as built-in cabinetry; unusual, rare, or superior building materials).

***In addition to the replacement cost for a building or portion thereof, the cost estimate should also include displacement time, functional downtime, and replacement of contents.*** Guidance for estimating these costs and different methodologies for estimating the replacement cost for a building can be found in training materials available on MHT's web site and in *Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning* (FEMA, 2005).

## A.7 ESTABLISH LOCAL PRESERVATION PRIORITIES

It is logistically and financially impossible to protect all the vulnerable historic properties within a community from flooding; therefore, a planning team must identify which resources are the most important and consider the feasibility of mitigation for those properties. While it is tempting to say that everything is important, the loss of certain properties would irrevocably alter the look and feel – the sense of place – of the community. ***The process of prioritization requires thoughtful consideration and engagement with the public about what is important in conveying the history of the community, what really makes it feel like home, and how historic resources contribute to the area's economic vitality.***

Establishing preservation priorities for flood-prone properties does not occur in a vacuum. For example, other state and local planning documents may contain prioritizations of historic properties that should be consulted and considered. (*Refer to Other Local Plans, page 2.6.*) Aligning priorities across planning documents will help develop mitigation actions for historic resources that are integrated with existing programs and initiatives and may also help to identify potential sources of funding for mitigation actions. Because these other plans have also gone through a vetting and approval process, it may be easier to garner support for the mitigation actions developed based on a previously prioritized list of historic resources.

However, even established preservation priorities should be vetted and confirmed within the hazard mitigation planning process, and many communities will not have established preservation priorities through a hazard mitigation planning process. ***To that end, this Guide suggests a simple approach that utilizes four factors to determine the overall importance of historic properties to the community. This four-factor method shifts the prioritization decisions from a top-down approach, focused on planners and professional preservationists, to a more balanced approach that can incorporate meaningful community input.***

- **Critical to Sense of Place.** What resources contribute to the community’s sense of place, identity, and cultural heritage? The public’s answer to this question may not adhere precisely to definitions of “historic resources” as employed by preservation professionals but should still be considered. Examples of critical resources could include a Main Street or residential streetscape, a historic neighborhood, a town plan, a community center, a park, or a school.
- **Vulnerable to Flood Hazards.** Using information from the risk assessment, identify the level of risk faced by the resource. Risk should be defined prior to the prioritization process, and the definition for risk should be consistently applied to each resource that is evaluated. The risk could be defined as a range. For example, high risk could be the range between complete destruction of the building and 50% or more damaged (where the cost to return the building to its pre-damaged condition would equal or exceed 50% of the property’s pre-damaged market value); moderate risk could be less than 50% damage; and low risk could be little or no damage. A second option is to define risk relative to location in a floodplain. High risk could then be defined as all resources in SFHA; moderate risk as all resources in the 0.2% annual chance floodplain; and low risk as all properties beyond the 0.2% annual chance floodplain. A third definition might be that high risk is all properties in V Zones (SFHA, but subject to wave action where waves are 3-feet high or greater) and within the limit of moderate wave action (also referred to as the coastal A Zone, the portion of the SFHA that is subject to breaking waves of 3 to 1.5 feet high); moderate being properties located in the portions of the SFHA subject to waves that are one and half feet high or less; and low risk being properties in the 0.2% annual chance floodplain. For any study of vulnerability, the local government should also consider and, ideally, integrate climate projections, which are not reflected in the FIRM classifications. (*Refer to Flood Insurance Rate Maps, page 1.15.*)
- **Economic Contribution.** Does the property contribute to the community’s economy? Is it an economic driver in the community, such as a tourist destination, historic neighborhood, or downtown where revitalization is occurring? Examples of properties that contribute economically to a community could be a historic marketplace such as the Annapolis Market House, a destination like the Chesapeake Bay Maritime Museum, or a historic Main Street.
- **Other Considerations.** This factor is meant to be user-defined and adapted to local circumstances, based upon community input, to provide flexibility in evaluating attributes that are not captured by the other three evaluation factors. For example, ‘Other Considerations’ could be used to assign value to undocumented historic properties without known historic and architectural significance, or properties identified as important by the community but not designated, to prevent bias in favor of properties that are listed in the National Register or a local inventory. This factor could also be used to evaluate resources that lack integrity or are otherwise ineligible for listing in the

National Register or for local designation, but are important to the intangible culture of the community (i.e, a working waterfront with structures that may not meet the traditional definition of “historic,” but may be culturally significant). Conversely, ‘Other Considerations’ could be used to evaluate the level of significance of a property: is the resource National Register-designated, a contributing property within a National Register district, or locally designated, or was it evaluated and not designated because it did not meet National Register criteria?

Public engagement will help rank and identify a prioritized list of resources to be protected. *(Refer to Engage the Public, page 2.17.)* The evaluation process begins with determining the ranking value. A basic ranking system such as high/medium/low might be easiest to communicate to the public; however, it may be desirable to have a more nuanced ranking system to weigh the different factors based on what the planning team and the community feel are most important. This can be done by using a numerical value, such as 1 to 10, for each of the four factors, generating a cumulative score for each resource. The information can be compiled in a table, providing a clear comparison. The properties that receive the highest rank or score represent the community’s top priorities for protection. This community-based prioritization can help foster public support for historic resource FEMA presents an alternate prioritization approach in *Integrating Historic Properties and Cultural Resources Considerations into Hazard Mitigation Planning* (FEMA, 2005), focusing on professional preservation evaluation factors. FEMA’s cultural resource prioritization factors are geographic context of significance (national, tribal/state, local), level of significance, degree of integrity, economic importance, and public sentiment. This method has the advantage of being vetted by FEMA; however, the disadvantages include:

- Requiring leadership by a historic preservation professional or someone with experience in historic preservation;
- Prioritizing National Register designated properties over those that are locally designated or unstudied cultural resources; and

### RANKING HISTORIC RESOURCE VALUE TABLE

Resource	Critical	Vulnerable	Economic	Other	Priority Score

Table 2.1: A table can be a useful tool to establish preservation priorities in the protection of historic resources.

- Shifting resource prioritization heavily towards a top-down approach and away from the public.

***There is no “right” or “wrong” method for a community to choose to prioritize its cultural resources: different methods have different biases, advantages, and disadvantages.*** The alternative approach presented above and FEMA’s approach are two ways of many. A community may even develop their own approach to meet their own needs.

## A.8 DEVELOP MITIGATION GOALS & OBJECTIVES

Mitigation goals related to the protection of historic properties should be broad statements that describe what the plan is trying to achieve. Examples of goals include:

- Enhance the ability of historic resources to withstand a flood event;
- Protect historic resources located along a waterfront or in the commercial downtown; and/or
- Ensure continued heritage tourism by developing a plan to protect significant structures.

***Once goals are established, they should be checked against the local planning documents to ensure that the recommendations are consistent with other community goals.*** (Refer to *Other Local Plans, page 2.6.*) If the goals are consistent, the preservation perspective will reinforce the community’s larger goals. If complementary goals are not identified or there is a conflict, public engagement is required to establish common goals between local government and the community at large.

Unlike goals, which are broad statements, objectives are specific measurable strategies for protecting historic properties. Examples of objectives to enhance the ability of historic resources to withstand a flood event can include :

- Educate the public regarding flood threat to private property (*refer to Engage the Public, page 2.17*);
- Promote regular maintenance to reduce vulnerability (*refer to Encourage Property Maintenance, page 2.52*);
- Assess appropriate mitigation options for individual properties (*refer to Property-Specific Mitigation, page 2.62*);
- Develop design guidelines to clarify appropriate mitigation options (*refer to Develop Design Guidelines for Flood Mitigation, page 2.55*); and/or
- Provide property owners with information about existing financial programs to assist in mitigation implementation (*refer to Engage the Public, page 2.17*).

***As in other stages of the planning process, the planning team should seek and incorporate community input to ensure that the preservation goals and objectives fit within the larger hazard mitigation plan and meet the objectives of the local population.*** Public engagement also provides an opportunity to address differences of opinion prior to investing time developing appropriate mitigation options.

### PUBLIC ENGAGEMENT TO BUILD SUPPORT FOR MITIGATION

To help communicate the threat of sea-level rise and tidal flooding to the National Historic Landmark district, the City of Annapolis benefited from pro bono assistance from the University of Florida’s preservation program, Envision Heritage, which laser-scanned the vulnerable area and produced a video illustrating different flooding scenarios. The raw data from this project can also be used to augment historic property documentation.

## A.9 IDENTIFY, EVALUATE & PRIORITIZE MITIGATION OPTIONS FOR HISTORIC PROPERTIES

Hazard mitigation options can range from regulatory updates and identified future planning actions to large-scale community projects to smaller, property-specific mitigation projects. Mitigation options will have varying ease of implementation, level of support, financial requirements, and implementation timelines. Balancing mitigation options with the traditional approach to historic preservation can be a challenge. **From the preservation perspective, each flood mitigation option must be considered based on its potential impact on the historic integrity of the individual property and its surroundings. Actions at an individual property may affect the integrity of a historic district. Similarly, community-wide mitigation strategies will have effects on both the district and on individual properties.**

In reviewing mitigation options, the planning team should give special consideration to the following factors.

- **History of Adaptation.** Communities with a long history of flood vulnerability may also have a history of adaptation, including actions such as the relocation, floodproofing, or elevation of buildings. Continuing this traditional adaptation approach in a manner that is consistent with the historic precedent may minimize the impact of the proposed mitigation.
- **Community-Wide Strategies.** Community-wide mitigation projects such as infrastructure improvements have the benefit of protecting multiple properties, both historic and non-historic. However, some community-wide options can alter or destroy historic and cultural resources and their context, requiring careful consideration and evaluation. Because they protect multiple properties, they often have the added benefit of community support. They can also support vulnerable populations and their cultural heritage, particularly in communities where financial means for implementing individual property mitigation projects are limited. *(Refer to Community-Wide Mitigation, page 2.60, and Chapter 3: Selecting Preservation-Sensitive Mitigation Options.)*
- **Options that Meet Multiple Goals.** In evaluating mitigation options, particularly community-wide strategies and those at large-scale properties, it may be possible to improve flood resistance while meeting other goals. A community-wide mitigation project might include the construction of structural features, such as a levee or a seawall, which could be designed to double as a linear park or bike trail. Similarly, it might be possible to sensitively integrate parking into the occupancy-evacuated ground floor of a building, allowing for the replacement of surface parking with landscaping. An additional benefit may be that the project allows the community to capture additional credits in the Community Rating System, if the community participates in the program, which may help the community to achieve a higher classification. *(Refer to Community Rating System, page 1.25, and Mitigation, page 2.51.)*

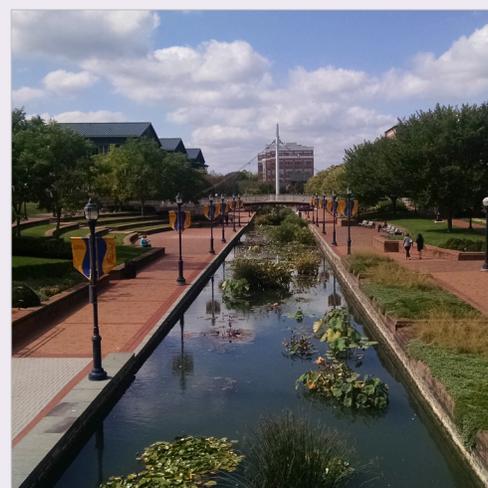


Figure 2.19 - Carroll Creek Park, Frederick, Frederick County.

### CARROLL CREEK PARK - FREDERICK, MD

The Carroll Creek Flood Control Project, or Carroll Creek Park, is an example of how the City of Frederick revitalized its historic downtown through an innovative approach to flood control. The flood control project has been ongoing since 1976, incorporating about 1.3 miles of 20 foot by 20 foot underground conduits, funneling floodwaters while maintaining a visible stream of water at the surface. It was modeled on the Riverwalk in Austin, Texas, with meanders, spaces for pedestrians to walk or sit, and areas for gathering like a small amphitheater along the stream, all within a block or two of retail, restaurants, and housing in the historic downtown of Frederick.

The cost to date is roughly \$60 million dollars, with \$20 million contributed by the City and the rest by the State and Frederick County. The project completely removed downtown Frederick from the mapped, regulatory floodplain and spurred revitalization. The City of Frederick's Office of Economic Development estimates that the City receives 1.7 million visitors from more than 50 miles away and that the project led to the creation of 405,000 square feet of office space, 150,000 square feet of retail space, 1,500 new jobs, and more than \$150 million dollars in private investment.

- **Scalability.** Given financial constraints and long-term changes in vulnerability due to climate change, communities should consider the degree to which mitigation options are scalable and can be built upon as time passes.

*To evaluate and select specific mitigation options as part of the planning process, the planning team should consult [Mitigation \(page 2.51\)](#) of this Guide and [Chapter 3: Selecting Preservation-Sensitive Mitigation Options](#). The planning team should consider multiple options simultaneously, from large-scale, expensive projects to readily achievable, short-term options that can be implemented quickly or incrementally.*

By balancing local preservation priorities and cost-effectiveness alongside the STAPLEE Evaluation, the planning team can select the best mitigation options for the community. (*Refer to [STAPLEE Evaluation, below](#).*)

- **Aligned with Local Preservation Priorities.** In selecting mitigation options, it is important to evaluate whether those options meet local preservation priorities and protect historic resources with the least intrusive mitigation measures. (*Refer to [Establish Local Preservation Priorities, page 2.28](#), and [Chapter 3: Selecting Preservation-Sensitive Mitigation Options](#).*)
- **Cost Effectiveness.** Mitigation options must be cost-effective. If the value associated with the implementation equals or is lower than the flood loss, FEMA considers the mitigation option to be cost-effective, qualifying the option for potential FEMA funding. Often, the planning team can illustrate cost-effectiveness by comparing the cost of implementation to the cost of the potential damage if nothing is done. The cost associated with the do-nothing approach includes:
  - The values calculated as part of a historic property hazard assessment (*refer to [Document & Assess Flood Risks to Historic Properties, page 2.21](#)*); and
  - Projected cost of the damages if the mitigation action is not implemented. (*Refer to [Estimate Economic Losses, page 2.27](#)*.)
- **STAPLEE Evaluation.** The STAPLEE analysis, a tool developed by FEMA, can be used to evaluate mitigation options for historic resources in a community. It utilizes the following criteria: Social, Technical, Administrative, Political, Legal, Economic, and Environmental favorability. The STAPLEE Action Evaluation Table is included in *Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning*. (FEMA, 2005). Each potential mitigation option is evaluated by ranking it for multiple factors in a STAPLEE table devoted to that option.

Evaluating options using these criteria will narrow potential mitigation options to those most appropriate and feasible to implement in a community. MHT is available for consultation during the STAPLEE review process to assist in the evaluation and provide feedback about whether proposed mitigation options are consistent with historic preservation best practices and project review criteria. (*Refer to [Historic Property Project Review sidebar, page 2.36](#)*.)

Using the results of this evaluation, the hazard mitigation planning team, under the guidance of the local emergency management office, will prioritize and then select mitigation options that they deem best for the community. Selected mitigation options should be clear, achievable, and consistent with the local government's overall hazard mitigation plan goals.

#### A.10 WRITE, ADOPT & IMPLEMENT THE PLAN

The local hazard mitigation plan will detail how and when a community will advance mitigation options, including estimated project costs and schedules. Developing sound strategies for implementation will include consulting with stakeholders to identify potential funding sources and partnership opportunities. ***If proposed mitigation options will negatively impact the integrity of historic properties, preservation professionals and advocates, including MHT, can suggest ways to minimize that impact.*** In addition, seeking MHT's early review of mitigation options can help establish community-wide criteria for state review of individual applications, such as building elevations, during the project review process. Early coordination may also assist in MHT's review of applications for historic preservation tax credits and easements.

The local hazard mitigation plan is typically prepared under the guidance of the local emergency management office. The role of preservation planners in the preparation of the plan will vary from conferring with the larger group to writing the chapter or annex devoted to the protection of historical and cultural resources, depending on the level of participation in the process. However historic properties are addressed, hazard mitigation plans for cultural resources will include:

- A summary of the planning process itself, including the sequence of actions taken and a list of team members and stakeholders who participated;
- A description of hazards considered and cultural resources identified;
- The results of the risk assessment and estimation of loss;
- Local preservation priorities;
- Mitigation goals and objectives;
- Mitigation actions that will help accomplish the established goals and objectives;
- Strategies that detail how the mitigation actions will be implemented and administered; and
- Documentation of public engagement conducted for the preservation component of the plan.

The emergency management office must ensure the support of partners and local leaders, shepherd the plan through the approval process adoption by ordinance, and communicate the final plan to the public. It is important to ensure that the defined strategies are consistent with other local planning documents including comprehensive plans and preservation plans. *(Refer to Evaluate*

*Options for Planning, page 2.4.)* Prior to submission to FEMA for approval, the plan must be submitted to MEMA for initial review and approval. This ensures that local hazard mitigation plans are consistent with the State’s mitigation goals and objectives and that the plan meets FEMA’s requirements. Following FEMA approval of the plan, the plan is adopted by the local municipality, or in the case of a county-prepared plan, by each municipality by ordinance. With adoption, the mitigation projects within the plan are eligible to receive Hazard Mitigation Assistance Program funding.

Hazard mitigation planning is a cyclical process that is never “done.” Local hazard mitigation plans must be updated at least every five years, thus allowing a community to remain eligible for funding under FEMA’s Hazard Mitigation Assistance programs. The time between updates can be used to lay the framework for enhancing historic and cultural resource protection in future updates and to build local support. It can also be used to improve local planning and preparedness to reduce the impacts of future flooding.



Figure 2.20 - Flooding on Main Street after Hurricane Irene, 2011. Port Deposit, Cecil County. (Source: Town of Port Deposit)

## A.11 PLANNING FOR RESPONSE & RECOVERY

Just as emergency management teams plan to address the protection of life and property after a flood, historic and cultural properties can also benefit from advanced planning that facilitates response and recovery efforts. ***The inclusion of historic preservation in emergency response and disaster planning can help to protect the community’s resources and avoid the unnecessary loss of historic materials.*** This includes the development of resources and procedures to expeditiously respond to hazards at historic properties in a manner that preserves historic fabric and character. To ensure that historic and cultural resources are considered, it is important to work with the local emergency management office and first responders to provide them with information on the location of historic resources and how to treat those resources during response operations, as well as to develop a protocol for engagement by historic preservation professionals in the response and recovery phases of an incident.

### a. Create an Expedited Review Process for Disaster Response

In the aftermath of a disaster, decisions must be made quickly to protect people and property. Consequently, historic preservation concerns must follow life-safety priorities and cannot be at the forefront of the decision-making process. Although communities will often establish a process for expedited permit reviews, preferably in advance of a disaster, they will not necessarily have the capacity for historic preservation review in the wake of an emergency. **To better protect historic properties, it is necessary that building code staff be familiar with historic preservation requirements and able to access preservation representatives in an emergency.**

An expedited historic property review process can include the identification of stabilization measures and minor repairs that can be completed without formal historic preservation commission review. Similarly, planning or building department staff can be authorized to approve certain changes utilizing the previously approved design guidelines when available. *(Refer to Develop Design Guidelines for Flood Mitigation, page 2.55.)* This could expedite stabilization and provision of a weather-tight building enclosures and reduce the administrative burden on property owners during the recovery process.

### b. Identify Preservation Partners to Assist in Post-Flood Review Process

**Prior to a flood event, it is important to identify preservation organizations and volunteers from adjacent communities and the county who will be able to assist in the review of preservation issues and provide information regarding preservation assistance programs.** Preservation partners who are not personally affected by the flood event can assist in providing timely responses to property owners. These partners can include representatives from adjoining communities as well as from MHT and FEMA.

### c. Include Historic Properties in the Debris Management Plan

Flooding and high winds disperse debris comprised of exterior building components and interior features. Some vulnerable building components include porches, railings, windows, shutters, and fences. If lost, historic materials and components can be costly and difficult to replace and, if replacement in kind is not the priority of the owner, the historic character of a building or structure can be compromised by an insensitive alteration or off-the-shelf alternative.

**One of the best tools for minimizing the loss of historic materials is to include a process to handle the salvage of these materials in the debris management plan.** This can also be promoted as a sustainable alternative to disposal. To be effective, the plan should include training personnel to sort debris and salvage historic materials and components rather than discarding all debris in a landfill. In the aftermath of a disaster, the salvaged items can be identified by property and made available to owners seeking to complete repairs.

### HISTORIC PROPERTY PROJECT REVIEW

Prior to undertaking any improvements, it is important to understand whether alterations to a property are subject to historic preservation review. Communities must provide property owners with clear direction as to whether they are subject to historic preservation project review through a historic preservation commission. When recovering from a flood, it may be beneficial to waive formal local review in some circumstances to expedite recovery. *(Refer to Create an Expedited Review Process for Disaster Response, at left.)*

Regardless of local review procedures, MHT review will be required for properties receiving state or federal funding or permits, seeking financial incentives such as tax credits, and those under easement to the MHT. These projects will be reviewed to ensure that, to the degree possible, proposed alterations do not affect the property's historic character, integrity, and eligibility for funding.

Although immediate stabilization repairs, including the installation of temporary shoring and roof tarps, should be undertaken as soon as possible to reduce the potential for additional damage, property owners must consult with the MHT in advance of any further work being undertaken.

#### d. Develop Recovery Information for Historic Property Owners

Immediately after a disaster, historic property owners will seek guidance about recovery, including what they should and can do to protect their properties and return to “normal.” This includes everything from who should verify structural stability to how to document damage and prevent secondary damage, such as mold, in the aftermath of a flood. While general information related to property owner response is available from the local emergency management office, owners of historic properties will have additional questions related to whether specific reviews are required, or if historic preservation assistance is available in the form of technical expertise or grant funding. *Specifically, information on recommended strategies for mitigation and historic property repairs must be provided to encourage property owners to conduct sensitive repairs and reduce the unnecessary loss of historic materials.* Websites should be prepared and brochures or handouts should be printed, readily available, and distributed to historic property owners in the immediate aftermath of an event. These materials should clarify that careful consideration must be given to properties subject to preservation easements or receiving preservation financial incentives such as grants and tax credits when evaluating flood stabilization and mitigation measures. *(Refer to Historic Property Project Review sidebar, page 2.36.)* While municipalities are encouraged to develop information specific to their circumstances, the MHT continues to develop resources that specifically address the relationship between flooding and historic properties and makes those resources available on their website.

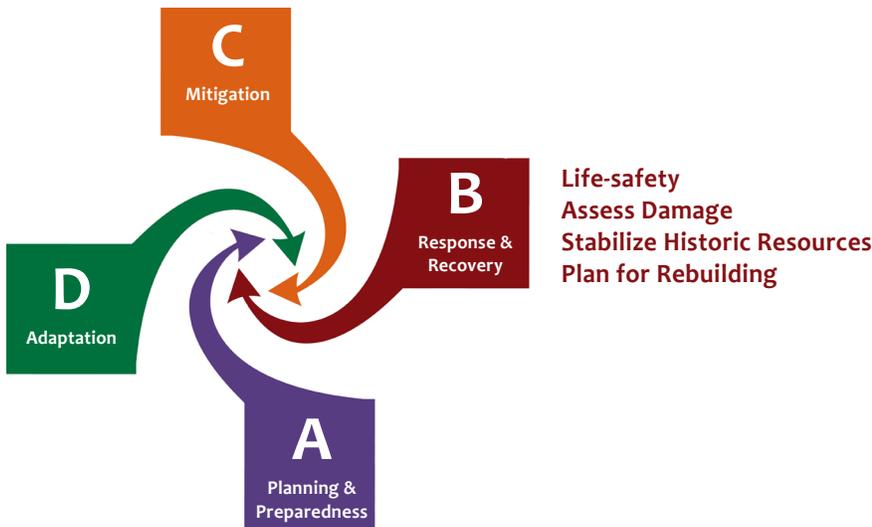
#### e. Establish a Demolition Delay Process

One challenge for local communities in the recovery process will be to temper eagerness to demolish flood-damaged historic buildings that could be stabilized and saved. The loss of significant community landmarks or significant numbers of properties in a historic district can greatly alter the character of an area. In addition, replacement buildings would need to be constructed to meet new building flood requirements, which often restrict habitable floors to higher elevations incompatible with a historic context. *(Refer to Understanding Repairing/Rebuilding Requirements, page 2.45.)*

One tool that can buy time for a careful evaluation of threatened buildings is a demolition delay ordinance. *In some communities, demolition delay ordinances are passed to allow time for owners of otherwise unprotected historic buildings to re-consider their options.* In the aftermath of a flood event, this can provide time for qualified architects, engineers, and contractors to assess and stabilize a building. To protect public safety, one of the key provisions of a demolition delay ordinance is identifying a process by which a building official can approve the immediate demolition of a building or structure that is so compromised that it poses an immediate hazard or threat.



Figure 2.21 - Building Tagged as "Unsafe Rear" by an assessment team. The rear wall of the first floor was blown out due to floodwater entering the front of the building. Ellicott City, Howard County, 2016.



## B. RESPONSE & RECOVERY

### B.1 RESPONSE

*Emergency response focuses primarily on life safety and, secondarily, on limiting property damage, although sometimes they are not mutually exclusive. As a result, historic preservation ranks lower among responders' priorities.* Response is always a local effort: the local emergency manager oversees the process, including the coordination of different departments and agencies, direction of damage assessments, and allocation of resources.

The immediate response will include:

- Establishing communications among local, state, and federal government agencies;
- Gathering information about impacted properties;
- Executing an assessment strategy;
- Facilitating first responders (police, fire, medical personnel) conducting search and rescue operations;
- Conducting fire suppression;
- Clearing debris to facilitate evacuation and first responder activities;
- Identifying structurally unsound buildings;
- Providing a safe location to meet basic human needs for food, water, shelter, and medical care; and
- Restoring essential community services.

MEMA encourages local governments to declare a local State of Emergency prior to requesting assistance from MEMA for response and recovery efforts. The local declaration, which can occur in advance of or following a disaster, triggers local policies, procedures, and plans that facilitate operations outside of normal activities. Typically, local governments utilize existing Memoranda of Understanding with neighboring jurisdictions to supplement their own resources; they

#### KEY QUESTION:

**What is the role of local government?**

#### KEY QUESTION:

**What are the primary goals of the government response immediately before and immediately after a flood event?**

may also use the Maryland Emergency Assistance Compact to request resources from any Maryland county (MEMA, 2015). The State may provide assistance when local response resources are exhausted or the jurisdiction requires resources that it does not possess.

If there is adequate notice in advance of a flood event, response can include evacuation and mobilization to protect buildings. Local government should advise property owners to proactively undertake activities including:

- Relocating possessions and equipment to the upper floors of a building or to higher ground;
- Relocating or secure outdoor furnishings and equipment;
- Clearing gutters, downspouts, and storm drains;
- Ensuring that sump pumps are functional and power supply is above projected flood water height;
- Clearing and securing floor drains;
- Installing automatic or closing manual anti-backflow valves to prevent interior damage;
- Disconnecting electrical appliances;
- Installing window protection if high winds are anticipated; and/or
- Placing sandbags and activate flood barriers.

Depending on the nature of the emergency, coordination with multiple entities may be required. Response to larger-scale events may include the establishment of an emergency response center to facilitate the allocation of information and resources to address the community's needs. **The emergency response center is typically coordinated by the local emergency manager; ideally a preservation planner would be available at the emergency response center once it is activated.** If the local government is overwhelmed by the response, the emergency manager can request assistance from other jurisdictions and MEMA. If the scale of disaster warrants, Maryland's governor can request a Disaster Declaration from the President.

The Maryland Department of Planning serves as the lead agency in the State's emergency management activities that relate to cultural resources, and the Maryland Historical Trust (MHT) works directly with federal, state, and local partners to provide technical assistance during response and recovery operations. **If local jurisdictions have impacted or potentially affected historic buildings and other cultural resources, they should consider requesting technical assistance from the MHT.** The local government may also appoint a preservation representative at a local level, such as a local or county preservation officer or planner, to assist in identifying resources to protect historic properties.

In the immediate aftermath of a flood, response activities focus on rescue and providing medical services. After life safety operations cease, the focus of response shifts towards meeting basic human needs, such as food and shelter, identification of unsafe conditions, restoring essential infrastructure such as electricity, and clearing



Figure 2.22 - The MHT and Howard County employees conduct damage assessments after the 2016 flash flood. Ellicott City, Howard County.

### KEY QUESTION:

How can planners and advocates help ensure that historic properties are protected during the response phase?

roadways. **Historic preservation interests begin to be involved when the response activities shift towards damage assessment and debris clearance.** At that time, the identified partners and debris management plan can be utilized to assist in the retention and protection of historic resources and fabric with the emergency manager's authorization. (Refer to *Create an Expedited Review Process for Disaster Response and Include Historic Properties in a Debris Management Plan*, page 2.36.) Some functions that can be performed by historic preservation professionals and advocates, and for which MHT can provide assistance, include:

- Performing initial inspections and damage assessments of historic properties (this can utilize newer technologies including drones and laser scanning, refer to *Planning for Response & Recovery*, page 2.35);
- Using the results of the initial inspections and damage assessments to conduct triage – for example, determining high priority (which buildings need stabilization), medium priority (which need actions to protect against the elements, such as tarping over holes in roof, plywood fastened over broken windows), and low priority (which require little or no action to protect building during response and recovery operations);
- Identifying procedures to collect, label, and store displaced building elements for reinstallation rather than disposal (refer to *Include Historic Properties in a Debris Management Plan*, page 2.36);
- Assisting with debris sorting to ensure that historic building components and other cultural resources are retained and not disposed of as waste;

## ELLICOTT CITY CASE STUDY

Immediately after a flash flood decimated the historic district of Ellicott City on the evening of July 30, 2016, MHT staff mobilized quickly to assist. Staff reached out to sister agencies to loop into response and recovery operations and arrived on site within 48 hours of the flood to view the damage firsthand, including to properties in the National Register Historic District. Field teams then spent a week and a half completing individual assessments of every historic property affected by the flood. Once finished, approximately 170 damage assessment forms were completed and over 1,500 photographs were taken. Through MHT's participation in the Maryland Silver Jackets program, staff were invited to join engineers from the Baltimore District of the US Army Corps of Engineers on the site visit to evaluate potential flood mitigation options for historic buildings. Overall, MHT spent more than 400 hours on flood assistance.

To help with the response and recovery effort, the statewide non-profit Preservation Maryland brought structural engineers from Keast & Hood to assess damaged properties, erect emergency support systems and save buildings from demolition. At the same time, the group helped to bring in the firm Direct Dimensions, which used photogrammetry software to create 3D models of the historic buildings, as well as Elevated Element, a leader in drone surveying technology that created special software specifically for this mission. Through these projects, historians and planners will have extremely accurate documentation of the district to aid in future decisions. Finally, Preservation Maryland opened a Preservation Resource Center on Main Street to serve Ellicott City, providing technical assistance, guidance, and support to property owners as they navigate the complicated process of restoring and repairing their flood damaged historic buildings.

As a result of these combined efforts, Ellicott City's historic buildings have had a better chance at recovery, and the County is better equipped to offer technical assistance and responses to questions from historic property owners about the rehabilitation of their buildings.



*Figure 2.23 - A tree was found lodged in the storefront during initial damage assessments after the 2016 flash flood in Ellicott City. Although the storefront glazing system was lost, its cornice and the transom windows above can be stabilized and retained in the rebuilding process.*

- Prioritizing preservation concerns and organizing specialized assistance;
- Identifying qualified design professionals and contractors to assist in evaluation and stabilization of historic properties;
- Providing information about cleanup, drying out flooded historic properties, etc.; and/or
- Providing information about funding opportunities to repair or rehabilitate historic properties.

## B.2 RECOVERY

### KEY QUESTION:

**What are the primary goals of the recovery phase after a flood event?**

Recovery entails restoring and rebuilding a community's physical, social, and economic structure following a disaster such as flooding. Post-disaster recovery generally falls into three categories:

- Short-term needs, including restoration of essential services such as water and electricity;
- Intermediate needs; and
- Long-term needs including provision of temporary housing, repair of existing structures, and addressing social, and economic needs.

Like response, recovery is also the purview of local government. ***The jurisdiction's local Emergency Operations Plan, which describes strategies and procedures for coordinating the recovery effort across all departments and agencies, will guide the operations.*** Through a series of Recovery Support Function annexes, the Emergency Operations Plan identifies actions and activities that agencies will take to facilitate access to resources as well as coordination among State and Federal agencies, non-governmental partners, and community stakeholders. *(Refer to Emergency Operations Plans, page 2.8.)*

Historic preservation falls under the Natural and Cultural Resources Recovery Support Function, primarily implemented by the local office of planning and zoning. Through this function, the agency provides information and assistance to communities to aid them in preserving, protecting, conserving, rehabilitating, recovering, and restoring natural resources and historic and cultural properties during the recovery stage. The Recovery Support Function annex lists supporting local agencies; state agencies such as the MHT, among others; FEMA Office of Environmental Planning and Historic Preservation for Region III; and non-governmental partners.

The emergency manager or the director of the planning and zoning office should have a copy of the Natural and Cultural Resources Recovery Support Function, which may be activated with or without a Presidential Disaster Declaration and supplements, rather than supplants, the recovery effort. ***Even if a local jurisdiction does not follow this process, there are recovery actions that affect historic properties and communities; these should involve historic preservation.***

## a. Stabilize Structures

After the floodwaters recede, initial assessments of buildings are conducted to identify safety issues before property owners are permitted to return. During this assessment, a building may be determined to be structurally unsafe or unsound. **Preservation professionals can assist in the evaluation process and provide guidance on appropriate stabilization measures to protect historic properties.** A local or county preservation officer typically leads these efforts with the assistance of preservation partners and technical assistance from the MHT. In the event of a Presidential Disaster Declaration, FEMA's Environmental and Historic Preservation team conducts preliminary disaster assessments.

Once public safety has been assured, affected historic properties should be stabilized as quickly as possible. This should be followed by a more detailed assessment to better understand the extent of damage prior to allowing occupants to return. **With the agreement of the local emergency manager and utilizing available expertise, preservation professionals, architects, engineers, and contractors can conduct assessments of historic properties.** As needed, assessments should be immediately

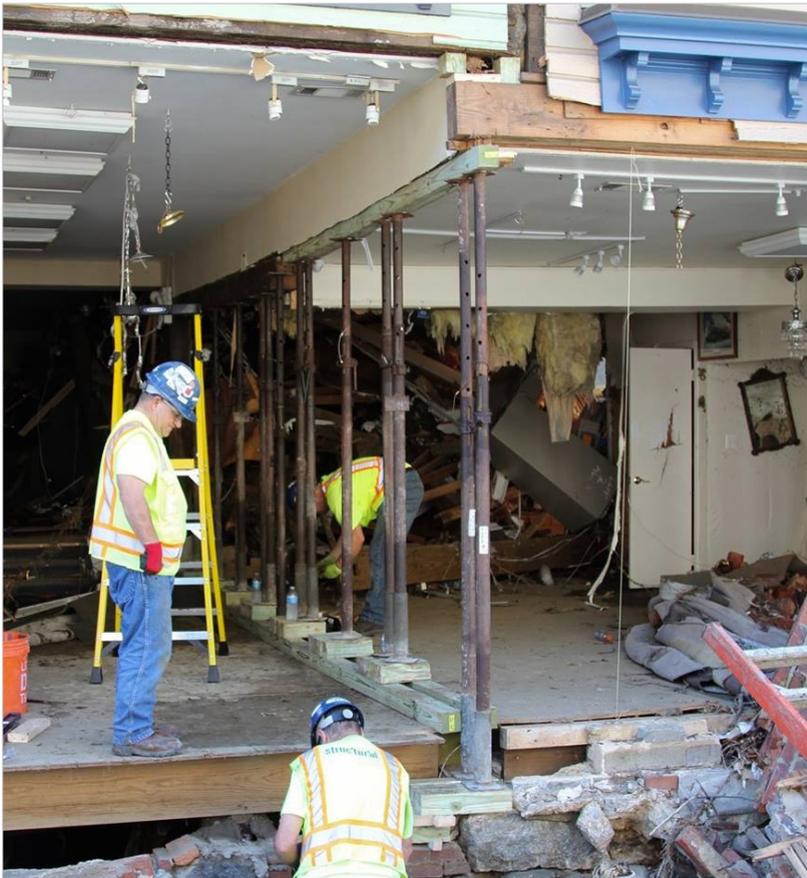


Figure 2.24 - Stabilizing buildings in Ellicott City, Howard County, 2016. (Source: Preservation Maryland.)

followed by structural stabilization and quick, temporary solutions to minimize further damage, such as tarping open roofs. Efforts should then be made to prevent or limit secondary damage to the building by providing ventilation to minimize mold and securing the building to prevent vandalism. Following stabilization efforts, property owners will be responsible for managing the recovery efforts for their buildings and parcels. *(Refer to Property-Specific Mitigation, page 2.62.)*

***In addition to supporting the local preservation planning team on-site in the aftermath of a flood, the MHT can also provide technical assistance and share historic resource documentation available from the Maryland Inventory of Historic Properties.***

### **KEY QUESTION:**

**What is the role of state and local government?**

## **b. Understand Repairing/Rebuilding Requirements**

The administrative requirements for repairing and rebuilding historic properties can be daunting, and without preparation, historic preservation concerns can be lost in the fray. ***By working with local officials in advance of a flood event, local planning and/or historic district commissions can implement zoning ordinance modifications to limit building heights, prepare design guidelines to encourage compatible alterations and construction within a historic context, and modify building codes to improve the resilience of historic buildings in a manner that maintains their historic integrity.*** *(Refer to Modify Zoning Ordinance, Develop Design Guidelines for Flood Mitigation, and Modify Building Code Requirements, pages 2.54-2.58.)* If the local regulatory framework does not have sufficient provisions for addressing historic properties, local preservation planners can also work with local officials in the aftermath of a flood, providing information on “best practices” developed by similar communities and available through the MHT.

As individual property owners plan to repair or rebuild their historic properties following a flood, several factors may influence the types of required reviews and approvals. Some examples are described below.

- **Level of Damage Incurred.** If damage to the building is such that the cost to restore the building to its pre-damaged condition would equal or exceed 50% of the market value of the building, under the local floodplain ordinance, this condition would likely meet the definition of “substantial damage.” Repairing this damage will require that the property also be brought into compliance with local floodplain regulations. However, the local floodplain ordinance may identify potential exceptions for properties that meet the ordinance’s definition of “historic structures.” *(Refer to State & Local Floodplain Regulations & Ordinances, page 1.18.)*
- **Value of Anticipated Improvements.** If the cost to improve a building equals or exceeds 50% of the market value of the building, those improvements would likely meet the definition of “substantial improvement,” which would

require the property be brought into compliance with local floodplain regulations. Local floodplain ordinance may identify potential exceptions for properties that meet the ordinance's definition of "historic structure." (*Refer to State & Local Floodplain Regulations & Ordinances, page 1.18.*)

- **Local Building Code Requirements.** Work to repair the building will likely require compliance with the municipal building code. Compliance could require that code violations be corrected and/or the building be brought up to meet current building codes. The International Building Code and local amendments may include exemptions for buildings that meet the code's definition of historic structure, so long as lack of compliance will not constitute a life safety hazard. (*Refer to Modify Building Code Requirements, page 2.58.*)
- **Local Floodplain Regulation Requirements.** Whether a building meets the local floodplain regulation's definition of "historic structure" will affect the degree to which that building must comply with the regulations. Regardless of whether a property is exempt from floodplain requirements in the local floodplain ordinance, a permit would still be required for any development in the SFHA. (*Refer to Maryland Model Floodplain Ordinance Definitions: Alternative 2, page 1.20, and State & Local Floodplain Regulations & Ordinances, page 1.18.*)
- **Local Historic Preservation Requirements.** If the property falls within a locally designated historic district, it may be subject to more stringent standards or criteria in the municipality's zoning code and review by a historic preservation commission for compliance with design guidelines and zoning prior to receiving a permit. (*Historic Property Project Review sidebar, page 2.36, and Mitigation, page 2.51.*)
- **Funding Source or Easement Requirements.** Grant funds and loans frequently have conditions and restrictions governing their use. For example, funding from the National Park Service and the MHT require compliance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties* (U.S. Department of the Interior, 2017) and may require that an easement be taken over the exterior and/or interior of the property. (*Refer to Historic Property Project Review sidebar, page 2.36.*) Some grants may require a match in the form of direct or in-kind funds and place restrictions on the source of the direct funding. Eligibility requirements and grant conditions should be carefully considered before applying for grant funding. If the property is listed in or determined eligible for listing in the National Register of Historic Places, federal or state funds, permits, or licenses will trigger historic preservation review by the lead agency and the MHT. (*Refer to Historic Property Project Review sidebar, page 2.36.*)
- **Flood Insurance Policy Requirements.** Different requirements may be triggered depending on whether or not a damaged

## KEY QUESTION:

How can planners and advocates help ensure that historic properties are protected during the recovery phase?

property is covered by flood insurance. For example, FEMA-funded mitigation requires property owners to purchase and maintain flood insurance as a condition for receiving funding. (Refer to *National Flood Insurance Program*, page 1.17.)

**Whenever possible, local governments or preservation advocates should prepare preservation-specific information in advance and make it available for distribution to historic property owners immediately after a flood to streamline the review process and facilitate recovery.** (Refer to *Develop Recovery Information for Historic Property Owners*, page 2.37.) Based upon the requirements of the floodplain ordinance as well as the level of damage and proposed improvement, these materials should include information about when additional code requirements may be triggered, including recovery activities that may impact eligibility for the National Register of Historic Places. (Refer to *State & Local Floodplain Regulations & Ordinances*, page 1.18, *Understanding Repairing/Rebuilding Requirements*, page 2.45, *Seek Funding*, page 2.48, and *Modify Building Code Requirements*, page 2.58.)

**Repairing and rebuilding may also provide an opportunity for owners to rectify an existing condition that makes their property susceptible to costly flood damage.** This can include elevating building systems above the Base Flood Elevation (BFE), improving structural connections between building components, and providing floodwater evacuation pathways for low-lying areas. (Refer to *Modify Building Code Requirements*, page 2.58.) On a larger scale, previously underutilized or poorly maintained historic buildings can be rehabilitated incorporating flood resilience measures, giving them new life. This might include the rehabilitation of historic commercial buildings along a Main Street corridor or the adaptive reuse of a warehouse for multifamily housing.

Prior to beginning any repair or rebuilding project, it is best for property owners to work with officials at all levels to ensure that requirements are understood and approvals are in place before commencing work. In the long run, this can save both time and money.

### c. Community Recovery

Community recovery projects, particularly those for which state and federal funding is required, will largely be based upon the mitigation projects identified in the local hazard mitigation plan. As a result, it is critical that preservation projects be identified in the plan and prioritized for implementation. (Refer to *Write, Adopt & Implement the Plan*, page 2.34.)

The recovery process can also provide an opportunity to conduct surveys to assess the risk of flooding at historic properties. (Refer to *Document & Assess Flood Risk for Historic Properties*, page 2.21, and *Community-Wide Mitigation*, page 2.60.) **Documentation projects that also examine flood risk and provide actions for mitigating that risk may be identified**

**in local hazard mitigation plans.** The MHT is available to assist communities in the identification of documentation or risk assessment projects. *(Refer to Document & Assess Risk for Historic Properties, page 2.21.)* The Maryland State Hazard Mitigation Plan (MEMA, 2016) also includes projects related to documentation and risk assessment of historic properties and archeological sites, which may make it possible for local governments to access support for these activities.

#### d. Seek Funding

Post-disaster assessments can provide a better understanding of a community's need and form the basis for requesting a Presidential Disaster Declaration, which may trigger funding opportunities from FEMA, as administered by MEMA (approximately half of all declared disasters receive FEMA funding, with the remainder ineligible). Other financial assistance from public and private entities may be available, including:

- Flood insurance, limited to affected properties with an active policy;
- U.S. Department of Housing and Urban Development; and/or
- U.S. Small Business Administration.

Although all affected properties may be eligible for certain types of federal funding, such as FEMA's Hazard Mitigation Assistance Program, some funding sources will be limited to identified or designated historic properties, with eligibility requirements varying among programs. Following stabilization, the local government should contact emergency management lead and support agencies, including MEMA, the MHT, and the Maryland Department of Housing and Community Development, for assistance. Potential sources of funding specifically directed towards historic properties include the MHT and the National Park Service.

***Emergency funding may be available for projects from the MHT. However, in most cases, work completed prior to authorization is not eligible for funding or may disqualify a project from eligibility altogether. As a result, identifying potential funding and reaching out to the funding agency as soon as possible to understand program requirements will provide the highest potential for financial assistance.***

Eligibility and conditions of funding will vary between programs. For example, for a post-disaster project to be eligible for FEMA funding, it must be identified in an approved hazard mitigation plan. However, if used to mitigate flood-prone properties, this funding will only apply to those properties covered by an active flood insurance policy. Purchase of flood insurance prior to the commencement of the mitigation project is mandatory, and the flood insurance policy must be maintained throughout the life of the property regardless of whether the ownership of the property changes. Therefore, it

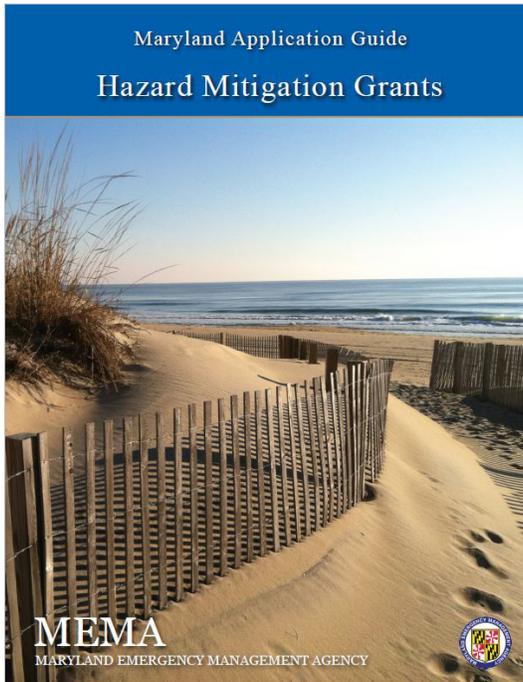


Figure 2.25 - The Maryland Emergency Management Agency offers hazard mitigation grant funding.

is critical for local historic preservation advocates to work with local emergency management personnel to identify mitigation projects to be included in a hazard mitigation plan; understand the regulatory responsibilities required and educate property owners, preferably in advance of a disaster; and advocate for the selection of those projects post-disaster. *(Refer to Develop Mitigation Goals & Objectives, page 2.31.)*

Most post-disaster projects will involve physical construction efforts in terms of stabilization, rebuilding, and mitigation. Projects that include funding through either federal or state sources, or that require federal or state permits, will be subject to historic preservation review by the MHT. *(Refer to Historic Property Project Review sidebar, page 2.36.)* If identified as a project in a hazard mitigation plan, the local government may seek non-construction funding for community-wide preservation projects such as architectural and historical documentation and survey, so long as these projects also address mitigation planning. For this reason (among others), the MHT recommends a combined approach that includes both property documentation and a risk assessment to identify which properties are vulnerable to natural hazards and identify potential mitigation options. *(Refer to Document & Assess Flood Risk to Historic Properties, page 2.21.)*

When pursuing funding, consideration should be given to:

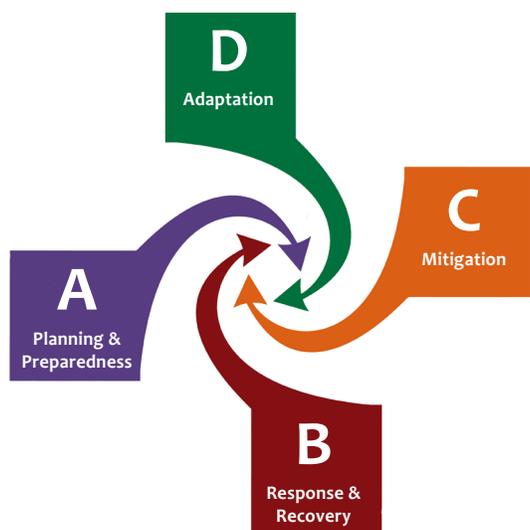
- Requirements for cost-sharing or matching funds;
- Whether the funds are a grant or a loan and, in the case of a loan, the conditions of repayment;
- Whether funds are immediately available, or whether the property owner must front the costs with expectation of reimbursement;
- The timeframe for funding or reimbursement; and
- Whether the proposed repair, reconstruction, or rehabilitation project will compromise the property's historic integrity and/or continued eligibility for listing on the National Register of Historic Places.

If a proposed project may compromise the historic integrity of a property and its continued National Register eligibility, the local government and property owner should consider three potential effects:

- The property may no longer be eligible for most historic preservation incentive programs, including state and federal tax credits and grants;
- If the property has benefited from prior funding through these programs, the beneficiary may have to return funds received; and
- Based upon the provisions of the local floodplain ordinance, properties that lose historic designation may be newly required to comply with stricter floodplain regulations, which can include substantial modifications, further impacting historic integrity and incurring additional costs for the

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property owner. (Refer to *State & Local Floodplain Regulations & Ordinances*, page 1.18.)



**Implement Protective Actions**  
**Community-Wide Mitigation**  
**Property-Specific Mitigation**

## C. MITIGATION

**“MITIGATION” = REDUCE HARM**

### **PRESERVATION MITIGATION**

... reduces impact on historic resources when undertaking a project.

### **HAZARD MITIGATION**

... reduces potential damage from a catastrophe.

### **CLIMATE MITIGATION**

... reduces the long-term risk and hazards to human life and property.

*After a flood event, there is a tendency to strive to return to “normal” pre-flood conditions. Although this response is often the most emotionally comfortable, reinstating a condition that is known to be prone to flood damage is not necessarily in a community’s or property owner’s best long-term interest.* This is particularly true in areas susceptible to increasing flooding and impacts associated with rising sea levels, subsidence, increased precipitation, and overdevelopment. In the best of circumstances, the community makes decisions about flood mitigation during the hazard mitigation planning process, and the resulting recommendations are implemented prior to a flood event to eliminate or reduce the water’s impact. (Refer to *Planning & Preparedness*, page 2.3.)

Flood mitigation for historic properties can occur in response to changes in the community’s regulatory framework or incentives, or via specific projects, such as improving local infrastructure or replacing flood-damaged materials in a building with flood-resistant materials and building systems. (Refer to *Implement Protective Actions*, page 2.52, *Community-Wide Mitigation*, page 2.60, and *Property-Specific Mitigation*, page 2.62.) *While mitigation can reduce the effect of flooding on historic properties, it will be impossible to protect all historically and culturally significant properties.* Financial and personnel resources, as well as funding, are limited, requiring hard choices. In any mitigation project, a key challenge will be balancing flood protection with the preservation of historic character and integrity.

This section of the *Guide* is designed to give an overview of mitigation actions that may be part of the hazard mitigation plan or proposed outside the planning process in response to concerns about flooding. Communities actively evaluating options for mitigation should also consult *Chapter 3: Selecting Preservation-Sensitive Mitigation Options*, which provides a detailed menu of interventions as well as advantages and disadvantages to consider from a preservation perspective.



Figure 2.26 - A pedestrian path with pervious paving provides a recreational amenity for the community while facilitating stormwater absorption in the event of a flood. Williamsport, Washington County.

## C.1 IMPLEMENT PROTECTIVE ACTIONS

Subsequent to or outside of the hazard mitigation planning process, there are a number of actions that a community can pursue to help protect historic properties. Many of these require public engagement which can, if appropriate, be merged with the outreach conducted during the planning process. *(Refer to Engage the Public, page 2.17.)*

### a. Encourage Property Maintenance

***In many ways, a well-maintained property can provide the best investment to reduce the potential damage from hazards such as flooding.*** All materials deteriorate over time, but without regular repair, deterioration will accelerate. Maintenance can slow natural deterioration and reduce potential risks associated with flood hazards, helping to protect historic properties and collections, and, more importantly, human life. Fostering long-term preservation of a historic property is an aspect of good stewardship. Examples of simple maintenance that reduce the vulnerability of historic properties to natural hazards include:

- Grading land to promote positive drainage away from historic buildings (although this should be approached with caution in areas with archeological protection or potential);
- Trimming overhanging tree limbs that might crash through a roof or take down electric and telephone lines in a storm;

#### KEY QUESTION:

**What types of activities can help mitigate the damage of flooding to historic properties?**

- Clearing site debris that might become waterborne or airborne (if high winds accompany the flood), clog storm drains, provide fuel for a fire, and harbor pests or cause damage to the historic building or surrounding buildings;
- Ensuring oil and propane tanks and associated connections are well maintained and anchored to prevent flotation;
- Removing clutter and unnecessary storage in a building, particularly if items are hazardous, highly flammable, or located in a flood-prone area;
- Maintaining roofing, flashing, gutters, and downspouts to direct stormwater away from buildings;
- Reinforcing roof framing to support wind and snow loads;
- Repointing masonry, including chimneys, walls, foundations, and piers, to prevent collapse and stormwater infiltration;
- Replacing or securing missing or dislodged siding to prevent stormwater infiltration and potential windborne debris;
- Replacing cracked window glass that can shatter in a wind storm and allow water infiltration;
- Maintaining shutters in an operational condition to protect windows from airborne debris in a wind storm;
- Replacing cracked pipes to prevent plumbing leaks or sewer failure; and
- Replacing batteries in smoke and carbon monoxide detectors.



*Figure 2.27 - Historic building in floodplain that would benefit from minor maintenance. Dorchester County.*

## b. Modify Zoning Ordinance

Community-wide zoning modifications can control significant changes to individual properties to protect the existing historic character of an area. This means of protection can occur outside of the hazard mitigation planning process. If protecting historic character is a goal, a community can monitor and limit extreme elevations, new construction, and significant additions by adopting the following measures.

- **Zoning Code Heights.** Local zoning codes typically include maximum allowable heights within defined areas. In flood-prone historic neighborhoods, maximum heights can be defined in a manner that is compatible with existing buildings, while limiting first floor elevation to the Base Flood Elevation (BFE) or the Design Flood Elevation (DFE) as locally mandated.
- **Streetscape Rhythm.** Buildings and side yards, porches and stoops, and windows and doors collectively establish patterns along a streetscape. By identifying these patterns and promoting conformance with existing conditions, the historic preservation commission, or similar review process, can recommend and approve designs sympathetic to surrounding conditions while meeting floodplain regulation requirements.
- **Limit Lot Coverage or Impervious Surface Ratio.** These limitations help to restrict inappropriately sized additions or alterations that can affect a historic building's integrity. They also aid in decreasing the square footage of impervious surfaces and promoting the use of pervious surfaces allows for stormwater to be absorbed and filtered through the ground, which reduces runoff, thereby reducing the volume of water that must be handled by the storm sewer system and improving water quality.

### KEY QUESTION:

*What planning tools are available to help protect historic communities?*

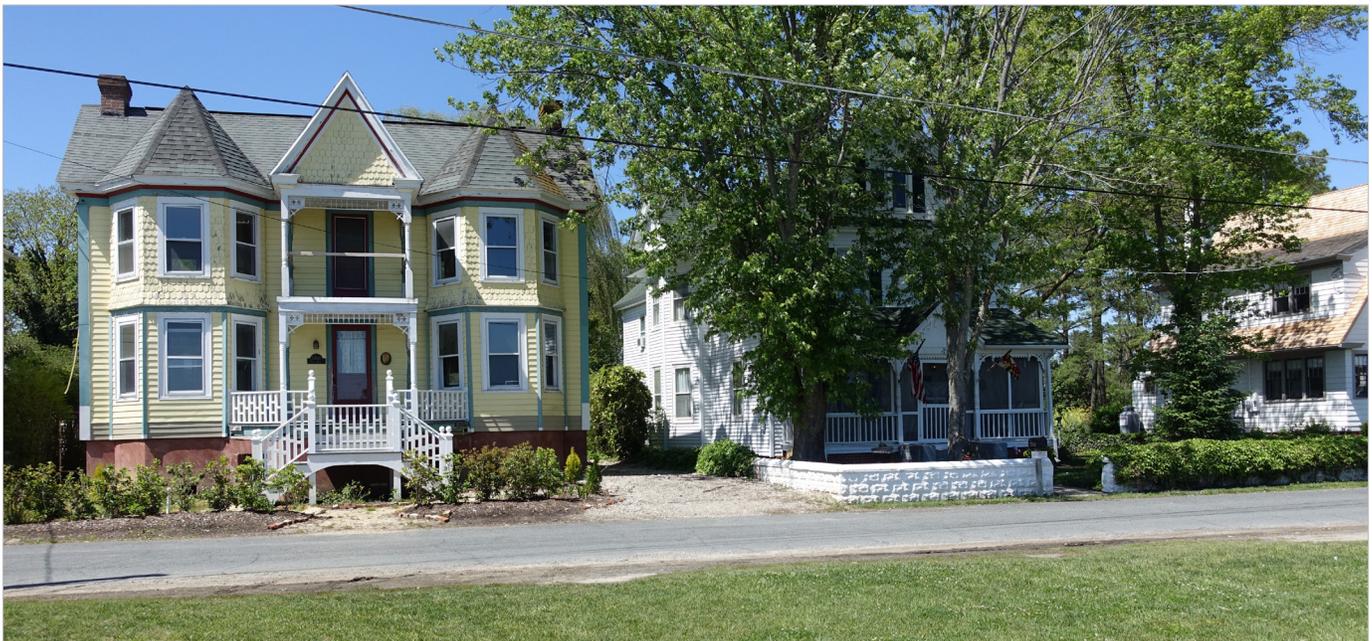


Figure 2.28 - The building on the left has been elevated, but retains its context with neighboring properties. Whitehaven, Wicomico County.

- **Implement Low-Impact Development Standards.** Low impact development standards manage stormwater through a variety of methods that mimic or preserve natural drainage processes to reduce stormwater runoff, which can help reduce nuisance or tidal flooding in a community. Because these standards promote the restoration of green and aquatic habitat in a community, they can help to blunt the effects of inappropriate fill-in by encouraging the restoration of community features, such as parks, that may have been altered or destroyed.
- **Limiting Stormwater Runoff from a Property.** Capturing rainwater and preventing runoff on a property-by-property basis can help to reduce the amount flooding at a specific property. Where these limitations prescribe the use of rain barrels, rain gardens, pervious paving, and other methods, a historic community’s design guidelines can be used to address the use of these methods in ways that minimize impacts to the integrity of the historic district.
- **Limiting Parking Under Single and Two-Family Residential Buildings.** Another way to restrict extreme elevations is to place limitations on parking beneath residential structures. Limiting parking underneath small occupancy residential buildings helps to protect the sidewalk culture of a historic district and preserve the streetscape’s historic appearance and rhythm.
- **Encouraging Character-Defining Elements Like Front Porches in Residential Construction in Lieu of Garage Doors.** Garage doors along a streetscape present a uniform, blank wall, and increases a feeling of emptiness along the streetscape. Front porches and other character-defining features such as landscaping, increase the visual interest of the streetscape, while providing areas for social interaction and create a lively pedestrian experience.

By their nature, zoning ordinances are unique to each community. Existing zoning ordinances should be reviewed through the lens of flood mitigation to uncover specific issues that, if modified, promote increased resilience while protecting the historic integrity of properties. They can also be modified to address stormwater runoff. *(Refer to Zoning Options, page 3.12.)* However, zoning ordinance modifications typically will not include recommendations which are sympathetic to historic properties or to historic materials. These issues can be addressed through design guidelines for flood mitigation.

### c. Develop Design Guidelines for Flood Mitigation

When faced with increased flood threat and insurance premiums, historic property owners should be empowered to “do something” to protect their properties from flood-related damage. As is often the case, many off-the-shelf solutions are not sensitive to the unique characteristics of historic buildings. ***Wherever possible, community-preferred mitigation alternatives should be identified prior to property owners***

**exploring individual solutions.** Ideally, the hazard mitigation planning process will proactively identify options appropriate to local properties based upon the type and level of flood risk. Preservation advocates will often be the front line in determining appropriate flood mitigation at historic properties, particularly in those communities with a formal historic preservation commission review process.

As a starting point, preservation advocates, stakeholders, and historic preservation commissions should identify clear policies that address flood mitigation in their communities. Policies should include statements that aim to:

- Identify historic adaptations for flooding in the community for specific building types and their appropriateness within today's context (*refer to Property-Specific Mitigation, page 2.62*);
- Define acceptable building elevation heights relative to the Base Flood Elevation (BFE) or Design Flood Elevation (DFE) (*refer to Location Definitions sidebar, page 1.22*);
- Identify appropriate materials and design considerations for common options such as higher foundations, extended stairs, flood barriers, and flood openings; and
- Identify acceptable damage-resistant materials or treatments for flood-prone areas.

Local governments should include these statements in comprehensive plans and preservation plans to increase their impact on the local decision-making process. (*Refer to Other Local Plans, page 2.6.*)

**Historic preservation commissions often have another tool in their arsenal that can be adapted to address flood mitigation at historic properties: design guidelines.** As part of the historic preservation review process, many historic preservation commissions prepare design guidelines to provide guidance to property owners, architects, and contractors for proposed exterior alterations to designated properties. These guidelines



ca. 1900  
Elevated 7'  
Good example.  
Elevation wall has open latticework at grade and the dark brown shingle siding above it matches the color and scale of the upper body of the house, in keeping with the character-defining features of this style.

Figure 2.29 - Excerpt from Division for Historic Preservation (NYSHPO) Elevation Guidelines.

## KEY QUESTION:

**What questions should planners consider when evaluating mitigation options for historic properties?**



National Flood Insurance Program (NFIP)

### Floodplain Management Bulletin Historic Structures

FEMA P-467-2

May 2008



Figure 2.30 - The National Flood Insurance Program provides guidance regarding Historic Structures in Bulletin P-467-2.

often include explanations in plain English, photographs and drawings to clarify and illustrate the review process, and building and zoning code requirements, as well as appropriate and inappropriate design approaches and materials.

A similar guidelines strategy can be employed to address flood mitigation options and recommendations. To be meaningful, the following should be considered:

- Types of historic properties in the community;
- Location of historic properties relative to the 1% and 0.2% floodplains;
- Height of the floor levels relative to the ground plane (BFE/DFE);
- Type of flooding (coastal with driving wind, tidal, flash floods, or ground water);
- Duration of flooding (regular cycles, sudden and fast draining, or prolonged water exposure);
- Local code, zoning, and design requirements;
- Flood design requirements (some municipalities impose more stringent requirements than the National Flood Insurance Program) (*refer to Participate in the Community Rating System, page 2.59*);
- Site mitigation options (*refer to Landscape Improvements, page 3.20*);
- Building mitigation options (*refer to Building Mitigation, page 3.21*); and
- Variation in appropriate mitigation options based upon level of historic significance, if applicable.

Flood mitigation design guidelines can be a stand-alone document or a chapter in an existing design guidelines document. If incorporated into existing design guidelines, the existing guidelines should be reviewed and updated so that existing recommendations and requirements are current and do not conflict with flood mitigation recommendations.

**Design guidelines should reflect the 2017 update to The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings, which contains several sections that address resilience to natural hazards.**

Within the document, the National Park Service indicates that more materials and guidance on this topic will be forthcoming; therefore, preservation planners and historic preservation commissions that wish to address resilience should ensure that they have the most up-to-date guidance available. In addition, if the community is a Certified Local Government, the Maryland Historical Trust (MHT) should be provided the opportunity for review early in the process or, at a minimum, prior to local adoption, to confirm that the proposed recommendations will not negatively impact the integrity of the resources or result in de-listing or ineligibility for financial incentives such as tax credits or grants.

#### d. Modify Building Code Requirements

As with zoning codes, building code compliance is typically triggered by submission of a building permit application to construct a new building or modify an existing building. Local governments can impose building code regulations stricter than state requirements for flood resistance for new or substantially improved buildings. More stringent building code requirements also benefit local governments that participate in the Community Rating System. (*Refer to Participate in the Community Rating System, page 2.59, and State & Local Floodplain Regulations & Ordinances, page 1.18.*)

Possible building code requirements to reduce potential flood-related damage include:

- Designing a building's structural system to withstand flood impacts;
- Locating all living space above the BFE/DFE;
- Limiting allowable use of building below the BFE/DFE;
- Locating building systems above the BFE/DFE;
- Requiring damage-resistant materials below the BFE/DFE; and
- Providing floodwater evacuation pathways for areas below the BFE/DFE.

Building code modifications written with flood issues in mind promote greater resilience; however, such modifications are typically only required as part of a larger renovation project. For example, either elevation or relocation is typically required for substantially improved or substantially damaged buildings to comply with National Flood Insurance Program requirements. (*Refer to Maryland Model Floodplain Management Ordinance Definitions, page 1.20.*)

Most municipalities utilize the International Building Code, potentially with local modifications. The International Code Council and FEMA developed *Reducing Flood Losses Through the International Codes: Coordinating Building Codes and Floodplain Management Regulations*, 4th Edition (2014) to provide guidance to municipalities considering code modifications.

**Although some building code-required modifications may be appropriate for most properties, others may be at odds with the preservation of historic buildings. Requirements that affect portions of buildings below the BFE/DFE can be particularly contentious.** For example, as a consequence of limiting the use of lower floor levels, property owners may be more likely to want to elevate the entire building, build an addition or extra story, or modify interior floor heights and, consequently, window heights. Care should be taken to balance the requirements for compliance and the preservation of historic properties. (*Refer to Building Mitigation, page 3.21.*) Additionally, the construction of code compliant new construction within historic districts can have a negative impact on the streetscape and context and affect the character of the district.

## KEY QUESTION:

**What can local governments do to promote and incentive good mitigation practices?**

### FINANCIAL INCENTIVES

Historic preservation tax credits are an effective financial incentive for the rehabilitation and restoration of historic properties. The City of Annapolis recently revised its historic preservation tax credit to include a tax credit for 25% of qualified preservation, restoration, and/or rehabilitation on income-producing properties that include hazard mitigation. Mitigation work must meet the criteria set forth in the City's Code of Ordinance, the *Historic Preservation Commission Design Manual*, and the *Secretary of the Interior's Standards for Rehabilitation*. Inclusion of hazard mitigation in the historic preservation tax credit purposefully coincides with the completion of the *Weather It Together Plan*, an annex to the City's Hazard Mitigation Plan that specifically addresses historic properties and cultural resources. The tax credit and *Weather It Together* mutually support each other and reinforce the City's commitment to protecting its cultural resources from the effects of natural hazards and climate change.

The District of Columbia's RiverSmart Program is a suite of financial incentives for residential property owners, multifamily residents, building managers, non-profit organizations, houses of worship, and schools that includes small grants and rebates for projects that reduce stormwater runoff. Programs offer grant funding with 10% cost share by the property owner for landscape improvements and other stormwater capture best practices. Teachers also receive special training when the program is used to add nature conservation areas to school grounds. In addition to grants, the program offers rebates for the installation of green roofs, for the purchase and planting of trees, for capturing water in rain barrels, for installing rain gardens, and for removing impervious surface and replacing it with permeable pavers or vegetation.

### e. Participate in the Community Rating System

The Community Rating System (CRS) is a voluntary incentive program within the National Flood Insurance Program (NFIP) that recognizes and encourages community floodplain management efforts that exceed the minimum NFIP requirements. (*Refer to Community Rating System, page 1.25.*) Local governments participating in the CRS adopt more stringent floodplain regulations and undertake activities to better quantify their flood risk. They also conduct outreach related to floodplain regulation, flood mitigation, and insurance, as well as undertake mitigation projects to reduce their flood risk. In turn, the community receives reduced flood insurance rates for properties located in the Special Flood Hazard Area (SFHA).

### f. Develop Incentives to Encourage Sensitive Property Mitigation

*In the same way that federal and state agencies provide financial incentives for hazard mitigation actions, local jurisdictions can develop financial incentives to promote sensitive property mitigation.* While historic preservation tax credits are traditionally used to preserve, restore, or rehabilitate historic buildings, they could also be used to incentivize historic property owners to modify buildings for hazard mitigation. *Should a local government choose to develop or expand a tax credit to include hazard mitigation for historic properties, careful consideration should be given to defining allowable mitigation building adaptations that are consistent with character of the community and traditional or historic adaptations to flood hazard.* If the incentive encourages modifications that may affect a property's historic integrity and/or eligibility for the National Register of Historic Places, participation may affect a property's eligibility for historic preservation financial incentives.

Local incentive programs that help to fund building maintenance for properties that meet specific conditions – for example, historic properties located in economic development zones or areas that have suffered disinvestment – could motivate historic property owners to undertake relatively inexpensive and easily implemented actions to reduce the impact of nuisance level flooding at their property. Similarly, a program that addresses the reduction of stormwater runoff could offer a grant towards landscape enhancements like the purchase and planting of shade trees, purchase of rain barrels, installation of pervious pavers, and landscaping improvements that restore native plantings. Programs should be coordinated with the local preservation planner or historic district commission liaison to ensure that the program is aligned with historic district guidelines or historic overlay zones.

Rebates can be another effective financial incentive, especially when coupled with other financial incentives, such as building permit rebates linked to property maintenance grants or rebates for installing pervious surfacing and landscaping linked to a stormwater runoff reduction program.



Figure 2.31 - The water's edge includes large rocks (structural shoreline protection) and a marsh (natural shoreline protection), to mitigate erosion along the St. Mary's River and protect the bluffs of Historic St. Mary's City. St. Mary's City, St. Mary's County.

## C.2 COMMUNITY-WIDE MITIGATION

As the name implies, community-wide mitigation projects are intended to protect multiple properties and large areas of land. Community-wide projects are generally favored by property owners because their implementation may reduce or eliminate the need for individual property mitigation efforts, thus reducing personal expenditures and inconvenience.

Because of their larger scale, community-wide projects typically require supplemental funding from outside of the municipality and access to or acquisition of property for implementation. Identifying community-wide mitigation projects in the hazard mitigation plan can not only reveal logistical issues and potential solutions, but can also make the projects eligible for mitigation funding through FEMA's Hazard Mitigation Assistance grant programs (MEMA, 2016).

**Another advantage of prior planning is that large-scale projects can be coordinated with adjacent municipalities that share similar flood vulnerabilities.** For example, shoreline protection could extend for the length of the vulnerable coastline rather than be truncated at a municipal border. A lack of coordination may have the unintended consequence of negatively impacting a neighboring municipality or of adjoining municipalities constructing conflicting solutions.

**From a historic preservation perspective, community-wide mitigation projects tend to be preferred since they typically have less impact on the historic integrity of individual properties. However, they can impact the historic context of resources and have the potential to destroy historic landscapes and archeological remains. (Refer to Chapter 3: Selecting Preservation-Sensitive Mitigation Options for the potential preservation impact for a range of mitigation measures.)**

It is important to note that community-wide options can have substantial environmental, economic, and social impacts. In addition to preservation and flood mitigation considerations, the planning team should identify and evaluate these effects, particularly as they relate to communities that are vulnerable (e.g, children, the elderly) or have suffered from disinvestment.

In evaluating strategies to address threats, some goals may be broadly stated, but the implications of those choices will need to be carefully considered. Issues that should be considered include the following:

- Are there specific mitigation projects identified in the hazard mitigation plan that will address the identified flood concern? If not, in a comprehensive plan or preservation plan? Is there consistency between the plans? Is an implementation timeline identified for the project? Are other projects identified as a higher priority? Is it possible to prioritize projects that maximize protection of historic and cultural resources?
- Floodplain boundaries can shift with the reissuance of Flood Insurance Rate Maps (FIRMs), so property flood zone classifications are subject to change. Does the mitigation project utilize current vulnerability assessments to identify the scope and extent? Does it anticipate changes in areas of vulnerability based upon predicted future trends?
- Does the proposed project require property acquisition? Are the affected properties historically or culturally significant? What is the impact on historic properties including buildings, structures, landscapes, and archeological sites? Does implementation require demolition? Is documentation possible prior to implementation? Will future development be limited?
- What is the timeframe for implementation? Is the timeframe consistent with the hazard mitigation plan, comprehensive plan, and preservation plan? If the money was available today to implement the project, how long would it take for it to be designed and constructed? How does the timeframe relate to the level of risk? Could interim measures alleviate flood risk until full implementation is possible?
- Will the community's real estate tax base be affected with the loss of revenue from affected properties? Will this require tax increases for other residents? Will municipal services and future projects need to be curtailed?
- Is there a plan for the long-term maintenance of the mitigation project? Structural projects will require intermediate inspections and possible reinforcement, while landscape projects require regular maintenance. Are there sufficient, dedicated resources for upkeep?

Large-scale structural interventions, such as shoreline protection, are typically major construction projects that can require decades to complete. ***Smaller-scale community mitigation projects can often be implemented on an incremental basis and at a faster pace, rather than all at once, such as a shoreline protection project. Implementation of these measures might provide a more immediate benefit that could***

**be sufficient to address the current level of threat and supplement a larger future intervention.** Some mitigation strategies benefit from participation by individual property owners and may be better suited to suburban and rural settings rather than to dense urban development. Municipalities can encourage participation by individual property owners through incentives or through penalties for lack of participation.

**Eligibility for FEMA funding typically requires a community to have a FEMA-approved local hazard mitigation plan that identifies the proposed intervention as a community goal.** (Refer to *Write, Adopt & Implement the Plan*, page 2.34.) Therefore, it is critical for communities to evaluate and identify larger scale mitigation projects in their hazard mitigation plans. If a plan's proposed mitigation measures have the potential to impact historic properties or other cultural resources, a local government should request the MHT's review as soon as possible, and at a minimum prior to the finalization of the hazard mitigation plan. Among other benefits, MHT's familiarity with the proposal in advance can assist in the required Section 106 review process, should the community pursue the project. (Refer to *Historic Property Project Review sidebar*, page 2.36.)

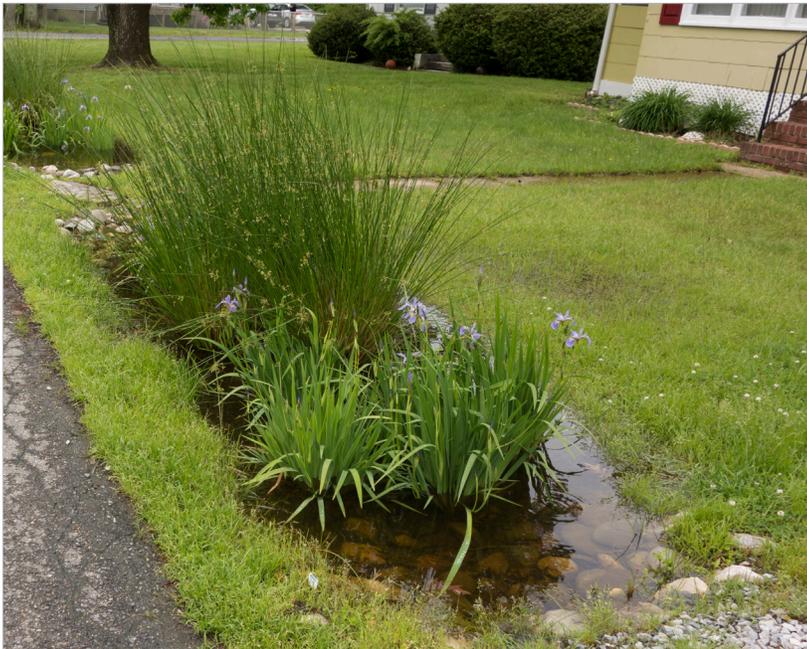


Figure 2.32 - Rain gardens provide an efficient means of minimizing stormwater runoff and can often be integrated into existing landscaping. Shady Side, Anne Arundel County.

### C.3 PROPERTY-SPECIFIC MITIGATION

Individual owners can also implement various mitigation projects to reduce the effects of flooding on their properties; these projects may address specific vulnerabilities and/or supplement community-wide projects. Property-specific mitigation options generally fall into one of three categories:

- **Landscape improvements**, ranging from simple, low-cost projects to complex, expensive interventions;
- **Basic improvements**, or simple, low-impact strategies that are relatively easy and inexpensive to implement; and
- **Building mitigation**, complex projects that often require the assistance of a design professional and typically have the greatest impact on historic integrity.

Although not applicable to dense, urban settings, landscape improvements at individual properties are often scaled-down versions of community-wide strategies, such as shoreline protection, on-site water storage, or berms and swales. Like community-wide options, when landscape improvements are completed at one property, they can negatively impact a neighboring property. This is particularly true in cases in which stormwater is directed to a neighboring property or when shoreline protection projects are completed only for a small area of shoreline, causing scour and erosion in the unprotected areas.

Basic improvements encompass a variety of actions that can include capturing, reducing, or slowing the discharge of stormwater runoff at a property by using rain barrels, native plantings, and/or rain gardens. Other basic improvements include creating positive drainage away from a building, elevating and anchoring exterior HVAC equipment above flood levels, installing check valves on sewer lines to prevent backflow of sewage due to floodwaters, or installing a sump pump in a basement. *In aggregate, smaller improvements will help reduce flooding to a certain extent but are more effective for occasional nuisance flooding than for larger events like base flood or storm surge.*

Building and property mitigation projects, such as relocation of critical systems and equipment above flood-prone elevations or the installation of solar collectors to provide electrical independence after a storm, are generally initiated by owners seeking to reduce flood insurance premiums, reduce potential damage from flooding, or improve resilience after a flood event. *Building mitigation projects are often complex, costly, and have an impact on the historic character of a building.* Although building mitigation can be voluntary and proactive, it can be required following a flood or as part of major building improvement. *(Refer to Understand Repairing/Rebuilding Requirements, page 2.45.)* Building elevation tends to be one of the more common responses, but it is typically at odds with historic preservation. *(Refer to Elevation, page 3.22.)* Communities that establish zoning code requirements prior to a flood event to limit extreme elevations are in a better position to respond to property owner requests that are inconsistent with local character. *(Refer to Implement Protective Actions, page 2.52.)*

Depending on the level of damage, nature and extent of improvements, and funding sources for different projects, review requirements for individual properties will vary. *(Refer to Understand Repairing/Rebuilding Requirements, page 2.45.)* In communities that have adopted historic district ordinances, alterations to locally designated historic properties may require

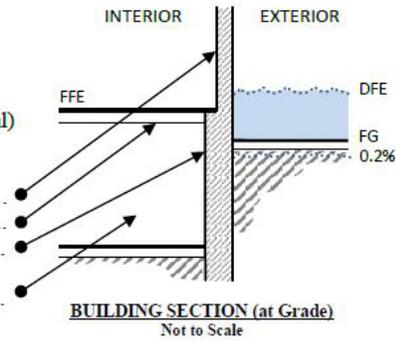
## IDENTIFY BEST PRACTICES FOR BUILDING TYPOLOGY

Many historic communities have characteristic building typologies: for example, the iconic Federal brick rowhouses of Baltimore; the Craftsman-style bungalows ubiquitous in smaller cities and suburbs; or the utilitarian crab-packing houses of the Eastern Shore. Where possible, communities should develop mitigation recommendations based on building typologies, achieving an economy of scale when it comes to design review. The U.S. Army Corps of Engineers (USACE) Baltimore District engineers have taken a building typology approach to flood mitigation in three historic Maryland municipalities: Annapolis, the City of Baltimore, and Ellicott City.

For prototypical historic buildings (as defined by local planners with the USACE), the USACE conducted assessments to identify potential “best practices” for building modifications to protect against flooding. The assessments contain an analysis of the flood risk to each building type and provide a variety of floodproofing options for each historic building type that balance preservation and mitigation. Each option is accompanied by a description of the advantages and disadvantages relative to flood mitigation. Options vary by typology but frequently include the installation of flood barriers; relocation of electrical panels and equipment above predicted flood levels; installation of backflow preventers on sewage lines; repointing masonry joints, sealing around building penetrations, and completion of basic maintenance on buildings to create a weather-tight building envelope; and the installation of sump pumps in below grade areas.

### Structure Information/Data

Name/Description: Row Home Residence  
 Location: 912 S Fell St.  
 Floodplain: Baltimore Harbor/Tidal  
 Occupancy type: Single-Family Dwelling (Residential)  
 No. of Stories: 3  
 Building Construction:  
 Exterior Walls: Brick Masonry  
 Floor Construction (1<sup>st</sup> Flr): Wood Frame  
 Foundation: Masonry/Concrete  
 Grade/Crawlspace/Basement: Basement (6.3' height to underside of floor framing)



### Structure/Flood Elevations Table:

FG	LO	FFE	ΔFFE-FG	1%	0.2%	DFE	ΔDFE-FG	ΔDFE-FFE
7.8'	8.3'	9.0'	1.2'	5.3'	7.5'	9.5'	1.7'	0.5'

Abbreviations: FG – Finished Grade; LO – Low Opening; FFE – Finished Floor Elevation; Δ – Delta/Difference;  
 1%/0.2% - Annual chance of exceedance of the given flood elevation; DFE – Design Flood Elevation

### Structure Photographs:



1. North Elevation (Front)



2. Foundation wall and basement access (Front)



3. South Elevation (Rear)

Figure 2.33 - Excerpt showing flood risk analysis from U.S. Army Corps of Engineers, Baltimore District, Baltimore City Nonstructural Analysis Interagency Project, 2016.

historic preservation commission review. Alterations to properties that have or are seeking state or federal funding or permits, or are subject to an easement held by MHT, will require MHT review. Property owners who proceed with a project that negatively impacts historic integrity will forfeit eligibility for preservation financial incentives such as tax credits and grants and may be required to repay any incentives previously received. *(Refer to Seek Funding, page 2.48.)*

In some cases, locally designated properties may be exempt from compliance with local floodplain ordinances and may be relieved from requirements related to substantial improvement. *(Refer to Maryland Model Resource Floodplain Management Ordinance Definitions, page 1.20.)* Although many property owners see this as a benefit, they may not understand that the lack of a compliance requirement does not diminish a property's vulnerability and may increase flood insurance premiums for properties where the lowest floor is below the Base Flood Elevation (BFE). In fact, if they choose to rebuild after flood damage or improve their property, they are likely increasing their personal financial risk. *(Refer to National Flood Insurance Program, page 1.17.)*

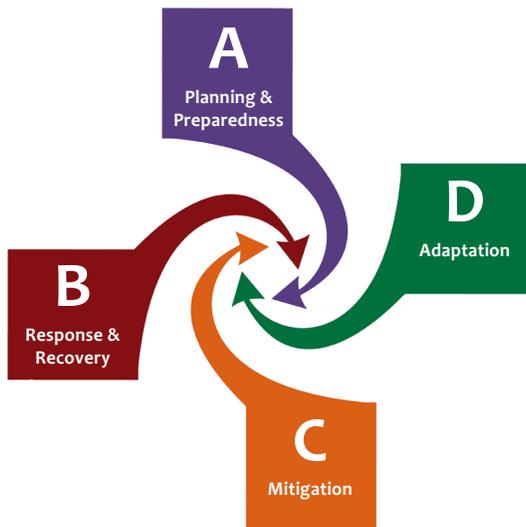
***As noted previously in this chapter, this Guide recommends that local governments establish parameters for flood mitigation that both provide a reasonable level of increased protection and are consistent with the community's character.*** Parameters can be established through design guidelines; zoning ordinance modifications, either on a community-wide basis or as a historic district overlay; or specific language in their floodplain ordinance. *(Refer to Modify Zoning Ordinance, page 2.54, and Develop Design Guidelines for Flood Mitigation, pages 2.55.)* This will help avoid the unintended consequence of property owners seeking different mitigation solutions and implementing them at different times. Within a historic district, this can result in visual inconsistency along a streetscape that was harmonious at the time of designation, fundamentally changing its character and potentially resulting in a loss of integrity.

When reviewing options for mitigation measures at individual historic properties, local governments and property owners should consider the following factors:

- Is the mitigation project being implemented at a property with a significant flood risk? Will it reduce the potential flood impact?
- Will the project negatively impact historic character? Will it impact the property's definition as a historic structure under the local floodplain ordinance or its eligibility for listing on the National Register of Historic Places? *(Refer to State & Local Floodplain Regulations & Ordinances, page 1.18.)* Will the project affect the property's local historic status?
- Will the work alter the property in a manner that limits comfortable occupancy? For example, raising a building above flood water might be prohibitive for those with mobility limitations, while prohibiting occupancy below grade may prove too restrictive to available habitable space.

- 
- Will implementation exceed the owner’s financial means or the property’s long-term value?
  - Is the project eligible for funding through tax credits, grants, or local incentives? If preservation funding was previously received for the property, will the project negatively impact historic integrity and require repayment of those funds?
  - Will the project increase the flood risk at neighboring properties? Is it possible to work with neighbors for a unified approach?
  - Will the completed project significantly exceed the community infrastructure’s ability to withstand a flood? Is the life expectancy of the community’s infrastructure, i.e. fresh water, sewage, electricity, and vehicular access, similar to that of the proposed project? Are neighbors and local businesses abandoning properties? Is the community well positioned to continue providing essential services like police, fire fighting and schools? *(Refer to Adaptation, page 2.67.)*

Where possible, communities should provide property owners with information, guidance, and parameters so they may make choices that are consistent with the local character. *(Refer to Implement Protective Actions, page 2.52).* Unfortunately, there is no “right” answer. Because of the unique characteristics of every situation, property owners should make every attempt to make informed choices, which will undoubtedly take into account the emotional attachment to the property, neighborhood, culture, and community.



Community Appropriate Adaptation  
Migration  
Accepting Loss & Moving Forward

“ADAPTATION” = CHANGE

## D. ADAPTATION

Although currently not included in the emergency management cycle, adaptation is gaining importance in communities wishing to address increasing nuisance flooding, precipitation, and more intense storm events. Often used interchangeably, climate adaptation and hazard mitigation are different yet related concepts. Within the current emergency management context, mitigation focuses on reduction of harm from known hazards and relies primarily on historic trends. Adaptation planning goes one step further: it anticipates future conditions and attempts to adjust natural and human systems to respond to and take advantage of those conditions. **Both mitigation and adaptation involve steps to improve community resilience to flooding, but adaptation is typically more expansive, including social, cultural, economic, structural, and environmental factors.**

Adaptation means “change.” Physical changes to structures and the environment can dramatically extend the life of a community in an environment susceptible to flooding. The ability to remain in flood-prone areas is dependent on a community’s willingness to embrace the changes needed to become more resilient and to accept the risk posed by flood hazards. Sometimes adaptation requires a community to acknowledge that remaining in place is no longer feasible and it will be necessary to abandon that area. Whatever the given situation, a community threatened by increased flooding must plan to manage the changes required to remain in place or to migrate to new locations.

Each community in Maryland has a different level of flood vulnerability and different circumstances that will inform their potential level of adaptation. Persistent flooding, worsened by climate change that progressively changes the landscape or a sudden occurrence such as a major storm or flash flood, can make continued life in an area undesirable. Some communities have access to human and financial resources for adaptation; some do not. For communities highly vulnerable to flooding, more change or adaptation will be needed to mitigate the effects of flood hazards and increase the community’s ability to withstand and recover from those effects. Major interventions may have serious consequences

on daily routines, the community setting, or residents' quality of life. Outside factors, including the future role and requirements of the National Flood Insurance Program, may set boundaries on what is or is not possible for adaptation.

**Adaptation will require rethinking how the community looks and feels, what aspects of the community are most characteristic and most valued, what can be saved for the future, what types of mitigation can be used to increase resiliency, where to invest, and what types of economic activity to support. Frequently, adaptation planning requires identifying areas where the community will physically shrink and areas that will expand and grow.** As with all planning efforts, decisions should be made through a deliberative process with extensive public input and captured and integrated across all the planning documents that guide community development: comprehensive plan, hazard mitigation plan, preservation plan, economic development plan, among others, as well as planning for capital improvement projects. (Refer to Other Local Plans, page 2.6.) Because it is a new process, adaptation requires ongoing communication with the public as efforts progress, to ensure that support remains constant and to resolve any obstacles or issues as they appear.



Figure 2.34 - House constructed on a higher foundation in the 1930s after an unnamed coastal storm. Ewell, Smith Island, Somerset County.

## D.1 MARYLAND'S HISTORY OF ADAPTATION

Maryland has an advantage that other states may not: its communities have been adapting to escalating flood hazards for hundreds of years. A study of the loss of community on Holland Island revealed that migration off-island was an individual choice as families were forced to relocate due to loss of landmass. While migration off-island was at first slow and sporadic, once the school, church, post office, and businesses on-island closed, the loss of

## Dorchester County 2018 Historic & Cultural Resources Hazard Mitigation & Risk Plan



Figure 2.35 - Dorchester County addresses historic and cultural resources in a 2018 addendum to their 2017 Hazard Mitigation Plan Update.

services resulted in a more rapid and total abandonment of the island (Gibbons and Nicholls, 2006 and Cronin, 2005). In their study of off-island migration, Arenstam Gibbons and Nicholls found that several houses, the church, and the school were dismantled and moved to the mainland (2006). Several of the houses relocated from Holland Island were moved to Crisfield and are known to locals as having been relocated from the island (Sherri Marsh Johns, personal communication, 2017). Elevation has also been a traditional adaptation to flooding and coastal storms. This is evident in both Crisfield and on Smith Island, where many houses were constructed with higher foundations in the 1930s after an unnamed coastal storm tore through the area (Sherri Marsh Johns, personal communication, 2017).

Residents of communities located on the Deal Island peninsula in Somerset County are facing a similar situation to the residents of Holland Island; however, they are addressing the situation on a community-wide basis, rather than as individuals. The Deal Island Peninsula Project (DIPP) is a collaborative effort between local, state, and federal government, nonprofit organizations, institutions, and residents to improve resiliency in the face of marsh conversion, erosion, and increased flooding. European settlement of the Deal Island peninsula began in the 17th century, and many residents are descended from those early settlers. The economy of the peninsula communities is maritime-driven: either watermen or businesses that support watermen.

Part of the DIPP involves researching and documenting the marine heritage of the peninsula communities, including their socio-cultural traditions, practices, and places. Discussions with residents also revealed the importance of preserving the historic resources and landscape that connected to the communities' Methodist heritage and history. One of the goals of the project is to develop adaptation plans that will enhance the resiliency of the communities' environment, heritage, and socio-economic conditions.

Using anthropological research methods (e.g. ethnographic field methods, interviews, pile-sorting, and prioritization analysis), team members identified and studied key existing resiliencies and vulnerabilities in the community and used that knowledge to help the communities strengthen their ability to adapt to changing climatological conditions. The communities on the peninsula have been responding to environmental and ecological changes for centuries, and resiliency and self-reliance are inherent to their community identity and culture. These communities have a higher risk tolerance, and as Gibbons and Nicholls predicted, that higher tolerance and the resources brought to bear under the DIPP are part of what drives decisions about how residents will adapt to maintain their communities in place for as long as possible (2006).

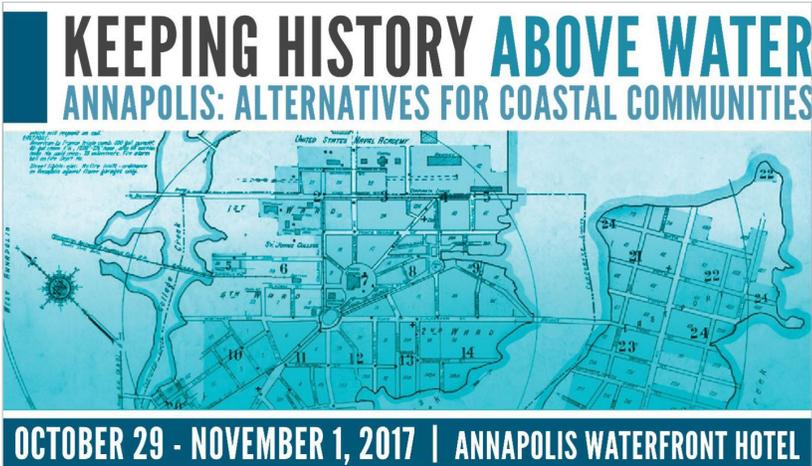


Figure 2.36 - As greater numbers of communities are challenged by flooding of historic resources, professional workshops, conferences, and seminars are being offered to share ideas and approaches to better address the issues.

## D.2 PLANNING FOR ADAPTATION

This Guide recommends a hazard mitigation planning process that includes climate projections and therefore allows communities to begin the climate adaptation process. Some jurisdictions, such as Annapolis and Baltimore, have already incorporated climate adaptation planning into hazard mitigation plans even without official guidance from federal and state government. **During this transitional time, planners also must grapple with communities and citizens at varying stages in their acknowledgement of the increased flooding and climate change.** While a single event such as a flash flood or strong storm may raise attention, the slow, progressive effects of rising water have been, and will be, unfolding for decades. Flood impacts vary from subtle to dramatic, depending on the environmental and physical characteristics of each location, and local social, cultural, and economic factors influence the response of populations in flood-prone areas. Due to these circumstances, residents of some communities believe that sea level rise and climate change are remote threats that might affect future generations, while others see their way of life disappearing before their eyes. In some cases, stakeholders within the same community will have very different perceptions of the problem, making planning and decision-making extremely challenging.

Currently, the effects of a changing climate are manifesting in these way, among others:

- Coastal towns are experiencing more nuisance flooding;
- Shorelines and river banks are actively eroding at a faster rate;
- Brackish water is intruding into low-lying areas, preventing farming, killing tree stands, and converting solid land to marsh;
- Wetter spring seasons and longer summer seasons affect many industries that depend on natural resources, including agriculture and fishing; and

### KEY QUESTION:

**How does climate adaptation relate to the emergency management cycle?**

### KEY QUESTION:

**How might changes in the climate impact historic communities?**

- Coastal storms have storm surges that are deeper and reach further inland due to warm, expanding oceans, and a higher elevation of mean sea level.

Regardless of the debate over why these changes are occurring or what to call these changes, local municipalities should begin planning now to address current natural hazards and anticipated future conditions. The key to adapting historic properties and communities to be more resilient in the face of the coming changes is to be proactive in crafting policies, plans, and ordinances. As part of the planning process, local governments should keep in mind that the State of Maryland, through the Maryland Commission on Climate Change, has developed guidance for state investment, published as the CoastSmart Council's *Infrastructure Siting and Design Guidelines* (MCCC, 2014). Communities considering alternatives for long-term adaptation should consult with MEMA and, if appropriate, the CoastSmart Council, to understand and plan for the future of state investment in their jurisdictions. Communities may also wish to develop their own guidance for future local investment based upon the state guidelines.

#### KEY QUESTION:

**What options can local governments pursue to help protect historic properties and cultural heritage threatened by increasing flooding?**

**For historic communities, adaptation planning can build on the community's inherent resiliencies and relationship to water while looking for solutions that provide both physical protection and support of traditional lifeways.** Marsh restoration projects, for example, can absorb and reduce storm surge and create habitat for fish and shellfish. Similarly, constructing oyster reefs off-shore creates habitat as well as breakwaters that reduce wave energy during storms. Daylighting historic streams, restoring channelized and submerged or buried streams, and buried wetlands to their natural appearance, configuration, and function, has a double benefit of better stormwater management and partial restoration of the historic setting. Adaptation strategies like these serve multiple purposes; in addition to hazard reduction and increasing the habitat of aquatic life, they contribute to economic resiliency for traditional water-based industries and recreation, while enhancing the historic and natural features of a community that make it attractive for heritage tourism. Since many historic communities in Maryland are water-oriented, whether riverine or coastal, adaptation strategies should consider how to adapt the buildings and infrastructure as well as the natural systems that also support the community.

Within the context of adaptation planning, climate mitigation can also imply greenhouse gas reduction. In this context, planners often value historic communities which were built prior to automobiles and can easily re-adapt to pedestrian routes and, in some cases, emphasize biking. Climate adaptation also emphasizes the retention and reuse of building fabric, which can benefit historic buildings, although the proposed treatments of older and historic properties do not always adhere to *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings* (U.S. Department of the Interior, 2017), which form the basis for preservation practice in the United States.



Figure 2.37 - Acceptance of building flooding: the earliest portion of this building, originally a warehouse, dates to the turn of the 19th century. The building was adapted to be a visitor center despite the risk of flooding. Flood openings are visible beneath the unpainted brick along the river-facing façade. Williamsport, Washington County.

### D.3 APPROPRIATE PHYSICAL ADAPTATION FOR HISTORIC PROPERTIES & COMMUNITIES

The philosophical approach to historic preservation, particularly with the passage of the National Historic Preservation Act of 1966, has favored minimizing change to historic properties. This approach has successfully allowed many communities to identify and protect the character that defines a sense of place, but it has largely ignored the context of environmental change, leaving many historic properties vulnerable to natural hazards, including flooding. *The Secretary of the Interior's Standards and Guidelines* (2017) now address resilience to natural hazards, recommending the least amount of intervention needed to achieve protection of a historic property from natural hazards. The *Guidelines* recognize that minimal intervention may not be enough to protect a property and that more invasive interventions may be necessary to ensure the continued survival of the building, despite the loss of some of the building's historic character.

Most local governments and the Maryland Historical Trust (MHT) utilize *The Secretary of the Interior's Standards* as the criteria for regulatory reviews regarding alterations to historic properties. The *Standards*, and more specifically the *Standards for Rehabilitation*, recognize that physical change may be necessary to allow the continued use of historic buildings and sites. Given the new acknowledgement of natural hazards in the *Guidelines*, and the imminent threat from flooding facing many historic Maryland communities, it may be necessary to adapt the philosophical approach to interpretation of the *Standards* and the level of change

## KEY QUESTION:

**How can communities address loss, given that some places will become uninhabitable over time?**

deemed acceptable. Flood vulnerability may require high-risk communities to rethink the recommended level of physical adaptation required to balance the desire to maintain historic fabric with the need to sustain building occupancy.

Simultaneously it must also be recognized that, for a variety of reasons, it will not be possible to save all historic resources. With the acceptance that physical loss of place might be inevitable comes the responsibility to document the historic fabric before it is lost. In addition to the abandonment and disappearance of physical features, historic places also have socio-cultural traditions and practices that can be lost when the people who occupy those places relocate.

## HISTORIC & CULTURAL RESOURCE DOCUMENTATION

### TRADITIONAL METHODS OF PROPERTY DOCUMENTATION

Depending on the type and significance of the historic property and the goals for documentation, a local government or preservation advocate may consider the following options:

- **Maryland Inventory of Historic Properties (MIHP) Form.** For any property, but particularly properties for which historic designation is uncertain or may be undesirable, preservation planners or consultants can work with the MHT to complete an MIHP form, including all required supporting documentation, and submit the information to MHT.
- **National Register of Historic Places Nomination.** For properties where formal designation is desired (for example, where historic preservation project review would be beneficial in the event of FEMA actions), preservation planners, consultants, or advocates can complete the National Register nomination form, including all required supporting documentation, and submit the information to MHT.
- **Local Inventory Collection.** Where properties would benefit from local designation, or if data collected is not sufficient to support a submission to the MIHP or the National Register, planners may elect to complete a local property inventory form and supporting documentation and submission to local department of planning and zoning.
- **Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER)/Historic American Landscapes Survey (HALS).** For extremely significant or rare historic properties, local planners and advocates may wish to propose HABS/HAER/HALS documentation and submission to the National Park Service.

### COMMUNITY-BASED METHODS OF DOCUMENTATION

- **Oral Histories.** Through audio or video interviews, volunteers can record oral histories of the community, particularly those aspects that may be lost or altered by increased flooding. Ideally, this process should be overseen by a professional or volunteer with experience in collecting oral histories. The local government can help facilitate this process and/or help locate an appropriate repository for the data, such as a local university.
- **Digital Archives.** A local government or non-profit group can encourage community members to share family photos and documents to be scanned and digitally archived. As with oral history collection, this process should be overseen by someone with experience, and options for data collection should be considered in advance.

### EMERGING METHODS OF DOCUMENTATION

- **Drones.** Using photographic and geographic data collected by a camera and GPS device mounted to a drone flown at a low altitude, a high resolution three-dimensional model of a streetscape, building, or landscape can be created.
- **Laser Scanning.** The process of 3D laser scanning (or phase-shift/phase-comparison scanning) generates a collection of xyz coordinates that are used to create a high resolution three-dimensional model of a streetscape, building, or landscape (W. Bohler and A. Marbs, 2002).

**To document historic places and cultural heritage threatened by flooding, communities should consider a combination of traditional historic property documentation, more informal community-based methods of documentation, and, in some cases, technological documentation techniques that require the help of a specialized contractor.** In cases of anticipated severe flooding, documentation can help capture the memory of a community through the voices of its residents prior to their migration. (Refer to *Historic & Cultural Resource Documentation*, page 2.73.)

Preservation planners and historic preservation commissions should also strive to work with local emergency managers and floodplain administrators to guide changes to infrastructure and the landscape. For example, although it may have a detrimental impact to some historic properties, it may be necessary to conduct a stream daylighting or marsh restoration project in an area that was historically filled and built upon to protect other properties, in effect sacrificing one set of historic resources for another. **Large-scale physical changes must have community-buy in to be effective, transparent, and fair, and these decisions must not be made lightly, but rather through a deliberative planning process and incorporation into the community's planning documents that guide the community's vision of its continuing evolution.**



Figure 2.38- Elevation in progress of a late-19th century historic home on St. George Island, St. Mary's County. The building was elevated to the BFE plus three feet of freeboard. (Source: MEMA)

#### D.4 MIGRATION

Migration is already occurring across Maryland, for example, on the Eastern Shore, as younger generations move out of rural villages and resettle in towns or cities. As areas once farmed have become too wet for too much of the growing season and traditional methods of subsistence cease, those economic systems collapse and disappear. For historic communities vulnerable to flood hazards, out-migration will likely continue as flooding progressively worsens. Progressive flooding can result in:

## COMMUNITY IMPACT OF FLOODING

In addition to affecting historic properties, flooding can remove the intangible qualities traditionally associated with a community. In Westernport, floodwater decimated the principal shopping corridor, shifting the central focus of the town. On Taylors Island, the intrusion of brackish water has altered what can grow and the amount of arable land and farming is disappearing. At Hoopers Island, the tradition of the watermen and oystermen is disappearing, and young families are choosing to move where there are more opportunities.

- Interrupted access as roadways and bridges become impassable;
- Lack of fresh water as well water becomes contaminated with brackish water;
- Sewer system backups that necessitate costly and frequent upgrading;
- Local industry interruptions which mean that businesses are no longer sustainable in a flood-prone environment; and
- Loss of employment opportunities and resultant out-migration of population.

Out-migration need not erase a historic community. Adaptation planning can encompass strategies for relocating historic communities and historic buildings. Philosophically, preservationists and planners will need to grapple with adapting their preservation paradigm and interpretation of the *Standards* to the circumstances they will face. Relocation of historic structures may become less contentious and more accepted as a method of preservation as well as flood protection. As occurred in the past on Maryland's Bay islands, historic communities may need to relocate wholesale. This is already occurring elsewhere in the United States among Native American communities, most notably in Louisiana and Alaska. Relocation of an entire historic community to a similar setting could preserve both tangible and intangible heritage, especially if water-oriented communities are relocated to areas that allow for traditional water-oriented practices to continue (e.g, boatbuilding, oystering, and crabbing).



Figure 2.39 - Abandoned historic home on Hooper's Island, Dorchester County.

## D.5 ACCEPTING LOSS AND MOVING FORWARD

Change can be frightening. In many ways, acceptance of the need for adaptation requires being able to say goodbye to the way we have known a community and its culture and to acknowledge the passing or changing of a way of life before moving on to a new way of looking at a community.

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In her 1969 book *On Death and Dying*, Swiss psychiatrist Elisabeth Kübler-Ross identified five stages in the grieving process. As some climate scientists and activists have noted, similar stages can be identified in the process of accepting the need for adaptation.

1. **Denial:** Belief that flooding does not pose an immediate threat, and if it will become a concern, it will be far in the future, not affecting me or my children.
2. **Anger:** Realization that flooding is affecting me or my community, and the unfairness of the burden it is placing on me because my property floods, my flood insurance premiums are increasing, or my community must make infrastructure improvements.
3. **Bargaining:** Recognition that I have a problem, accompanied by the conviction that I can fix the problem by implementing a mitigation measure, be it floodproofing, elevation, relocation, or demolition.
4. **Depression:** Sadness and hopelessness in the inevitability that my community may change radically or be abandoned and that its social and cultural structure may disappear because of the loss of buildings, landscapes, and infrastructure.
5. **Acceptance:** Acknowledgement of the fact that flooding is a problem, everything cannot be saved, and that what can be saved will be different from what it was – establishing a “new normal.”

*Adaptation shapes a future path that recognizes the significance of the past and incorporates elements before they are erased.* It is the responsibility of communities to identify their own goals as they adapt to changing conditions, whether it be implementing physical changes to historic properties or migrating and re-establishing the community in less risky locations. However, if communities fail to act and do not plan for the future, the results could be devastating, including ad hoc abandonment and dispersal. Historic communities have long legacies of evolution and change. Through adaptation, those changes can be planned for and managed to promote the protection, preservation, and reuse of historic buildings, while ensuring that the communities themselves continue to survive and thrive.

## KEY PLAYERS IN EMERGENCY MANAGEMENT AND THEIR ROLES

Although local governments ultimately have the responsibility of planning for their own futures, there are several federal, state, regional, and county agencies, departments, and organizations that can provide resources and assistance at the various stages of the emergency management cycle. This section includes a list of key players, primarily representative of federal and state levels, and their associated roles in the emergency management cycle. It is important to keep in mind that the specific functions and programs offered by the key players can change with time, therefore, their websites should be checked regularly for current information.

In addition, it is important to be aware that the primary mission of many of the identified agencies and departments, and therefore their strategies and recommendations, may be at odds with the traditional approach to historic preservation as defined by *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings* (2017), maintained and promulgated by the National Park Service. The MHT is available to provide guidance, particularly as local communities consider appropriate mitigation measures to protect cultural resources.

### a. Federal Emergency Management Agency

At the federal level, FEMA is the lead agency for emergency response activities. FEMA's activities at each phase in the emergency management cycle include, but are not limited to, the following:

#### Planning/Preparedness:

- Publishes Flood Insurance Rate Maps (FIRMs) to identify areas most likely to flood (*refer to Flood Insurance Rate Maps, page 1.15*)
- Administers the National Flood Insurance Program (*refer to National Flood Insurance Program, page 1.17*)
- Funds and approves updates to state and local hazard mitigation plans (*refer to Write, Adopt & Implement the Plan, page 2.34*)
- Provides preparedness guidance via publications, education and outreach activities ([www.fema.gov](http://www.fema.gov))
- Conducts training and exercises at all levels of government

#### Response & Recovery:

- Manages response to Presidential disaster declarations as well as recovery programs and activities
- Coordinates federal agencies during response and recovery (*refer to Response & Recovery, page 2.39*)

#### Mitigation:

- Provides pre- and post-disaster mitigation planning and project funding
- Provides guidance on how to retrofit and protect buildings against natural hazards

### b. U.S. Army Corps of Engineers

Among its many responsibilities, the U.S. Army Corps of Engineers (USACE) has authority to support mitigation of the nation's infrastructure and building stock to reduce the impacts of riverine and hurricane storm damage. The USACE has a strong presence in Maryland through their Baltimore District and the Maryland Silver Jackets.

- **Maryland Silver Jackets** – Begun in 2010, the Maryland Silver Jackets is comprised of a team of federal, regional, state, county, academic, and non-profit organizations, who conducts education and outreach activities for the public on flood risk and hazard mitigation. The Silver Jackets also share data and work cooperatively on mitigation projects to comprehensively address flood risks across the state. FEMA, MEMA, MDE, MD DNR, MD SHA, and MHT are all members. The USACE Baltimore District is the lead agency for the Maryland Silver Jackets.

#### *Preparedness*

- Provides flood risk/water resources technical assistance to communities through the Floodplain Management Services Program, Planning Assistance to the States Program, and the National Hurricane Program

#### *Response & Recovery:*

- Provides support and technical assistance to FEMA and communities during and following disasters

#### *Mitigation:*

- Provides Nonstructural approaches to flood proofing that are intended to reduce damage from encroaching flood water by altering a property; including acquiring and/or relocating a building, preparing emergency measures, such as sandbagging, flood proofing, and elevating structures. ([www.iwr.usace.army.mil/Missions/Flood-Risk-Management/Flood-Risk-Management-Program/Frequently-Asked-Questions/FAQ-Definitions/](http://www.iwr.usace.army.mil/Missions/Flood-Risk-Management/Flood-Risk-Management-Program/Frequently-Asked-Questions/FAQ-Definitions/))
- Designs and constructs flood risk management projects through its Civil Works program
- Provides technical assistance to communities so that they can construct mitigation projects

### **c. Maryland Emergency Management Agency**

The Maryland Emergency Management Agency (MEMA) is the State equivalent of FEMA. Its mission is to “Coordinating people, organizations, resources, and information to ensure the preparedness and resilience of the people, businesses, communities, and infrastructure of Maryland.”

Like FEMA, MEMA is involved in all four phases of the emergency management cycle.

#### *Planning/Preparedness:*

- Produces state-wide preparedness plans (e.g. *Maryland Hazard Mitigation Plan* and *Maryland Response Operations Plan*)
- Conducts training programs and exercises for state and local partners
- Reviews and approves local hazard mitigation plans before they go to FEMA for final approval
- Applies for and manages grants as the State administrative agency and official applicant for FEMA grants
- Conducts public outreach
- Implements the Maryland Emergency Management System

#### *Response & Recovery:*

- Coordinates the State’s response and recovery operations
- Works with FEMA to request Presidential Disaster Declarations and aids those affected by a disaster
- Manages FEMA mitigation and recovery programs post-disaster
- Operates and manages the State Emergency Operations Center and may also operate and manage the State’s Joint Information Center
- Operates and manages the state’s support to local disaster response and coordinates between federal agencies, state agencies, private sector partners, and volunteer organizations

#### *Mitigation:*

- Applies for and manages mitigation programs and projects funded through FEMA’s programs
- Develops and oversees mitigation projects in local communities

#### d. Maryland Department of the Environment

The Maryland Department of the Environment (MDE) focuses on flood planning/preparedness and has the responsibility of administering the National Flood Insurance Program (NFIP) in the State. (*Refer to National Flood Insurance Program, page 1.17.*) MDE provides technical assistance to local floodplain administrators regarding floodplain mapping activities and permits associated with development in floodplains on an as-needed basis.

MDE is also a Cooperating Technical Partner (CTP) with FEMA to revise the Flood Insurance Rate Maps (FIRMs) and associated Flood Insurance Studies (FIS) in Maryland. Because of that partnership, MDE has been successful in leveraging existing datasets, including Light Detection and Ranging (LiDAR) elevation data, to improve the mapping. In addition, updating the hydrology using GISHydro (a program used to assemble and evaluate hydrologic models for watershed analysis) and incorporating bridge and culvert data into the Hydrologic Engineering Center's River Analysis System models, has improved the mapping in areas labeled as Zone A where BFEs previously did not exist. This has resulted in the development of model-backed A Zones that is available as an additional dataset. MDE's DFIRM Flood Risk Application was created to provide local government with a planning tool for floodplain management, and for as an interface for the public to help understand their property's flood risk.

Based on Maryland's hydrology, MDE has developed a Model Floodplain Management Ordinance that meets all federal and state requirements for participation in the NFIP. (*Refer to State & Local Floodplain Regulations & Ordinances, page 1.18.*) Almost all communities in Maryland that participate in the NFIP have adopted the Model Ordinance or portions of the Model Ordinance.

As part of administering the NFIP, MDE also encourages communities to participate in the Community Rating System (CRS) to reduce the flood risk in their community and property owners' flood insurance premiums. (*Refer to Participate in the Community Rating System, page 2.59.*)

##### Planning/Preparedness:

- Administers the National Flood Insurance Program (*refer to National Flood Insurance Program, page 1.17*)
- Assists local floodplain administrators in efforts to reduce risks associated with development in floodplains

#### e. Maryland Department of Planning

The Maryland Department of Planning (MDP) is responsible for comprehensive planning throughout the state and provides technical assistance to local governments to assist their long-range planning activities. MDP can assist local governments with policy language to include in comprehensive plans to help local governments prepare for worsening hazards due to climate change, including the threats of those hazards to historic structures.

##### Planning/Preparedness:

- Supports state emergency operations by providing current and project data and analyses on demographic, economic, housing, and social characteristics of the state population

##### Response & Recovery:

- Providing technical assistance to state and federal agencies during disaster response activities
- Coordinates assistance programs to restore local government and help them to implement recovery

##### Mitigation:

- Reviews and prioritizes federally-funded hazard mitigation projects

## **f. Maryland Historical Trust**

The Maryland Historical Trust (MHT), an agency of the Maryland Department of Planning, acts on behalf of the State's preservation goals in all four phases of the emergency management cycle. Through its collaboration with local, federal, and state agencies and departments, as well as nonprofit organizations in a variety of programs and organizations, MHT ensures that Maryland's cultural resources are considered in emergency management decisions, hazard mitigation planning and sound floodplain management.

MHT also serves as a resource to local governments striving to integrate historic resources into their hazard mitigation planning projects and activities. This includes reviewing the potential impact of proposed mitigation options on historic resources during the planning and preparedness process. In the aftermath of a flood event, MHT is available to assist the emergency response team and local historic preservation commission representatives in conducting assessments and evaluating the appropriateness of proposed stabilization and/or repair options. This can be particularly helpful when communities are severely impacted or for those who have limited, local professional expertise.

### *Planning/Preparedness*

- Provides and administers grant funding and loans for bricks-and-mortar preservation projects
- Provides and administers grant funding for the identification of historic resources through survey and architectural and historical investigation
- Assists with the development of recovery plans to address the protection and preservation of historic resources

### *Response & Recovery*

- Provides technical assistance to communities immediately before and after an event, including preservation best practices
- Compiles and communicates information about impacted historic resources
- Participates in post-event damage assessment and review of economic options for recovery
- Coordinates with local government and state and federal partners
- Conducts outreach to impacted property owners

### *Mitigation:*

- Reviews and comments on hazard mitigation actions funded through state or federal grants that impact historic resources through the Section 106 process

## **g. Maryland Resiliency Partnership**

The Maryland Resiliency Partnership (MRP) includes various state agencies to provide a holistic approach to hazard mitigation planning by working collaboratively to increase the ability of buildings and infrastructure to withstand natural hazards and the effects of climate change. This includes supporting day-to-day decision making and long-term strategic planning to address hazard mitigation, floodplain management and coastal and climate resiliency, as well as encouraging activities that improve water quality across the state.

### *Planning/Preparedness*

- Provides tools to help local governments assess their vulnerability to natural hazards and climate change, lending their expertise where needed to support local mitigation projects and planning efforts
- Provides information to property owners and local government about mitigation, floodplain management, flood insurance, and protecting Maryland's history and diverse environment

### *Mitigation:*

- Funds multidisciplinary projects that apply mitigation and resiliency grants across different sectors

## h. Maryland Department of Natural Resources – Maryland CoastSmart Council

In 2014, the State of Maryland established the CoastSmart Council under the Maryland Department of Natural Resources (DNR) to establish criteria for State-funded spending on planning and capital improvement projects to mitigate potential sea level rise, coastal flooding, and storm surge. As part of its strategy to reduce the state's vulnerability to climate change, DNR prepared *Maryland at Risk: Sea-level Rise Adaptation & Response*, which recommends the following call to action:

The Comprehensive Strategy to Reduce Maryland's Vulnerability to Climate Change, a key component of Maryland's *Climate Action Plan*, sets forth the actions necessary to protect Maryland's people, property, natural resources, and public investments from the impacts of climate change. The vision for future preparedness is targeted at:

- 1) reducing impact to existing built environments, as well as to future growth and development;
- 2) shifting to sustainable investments and avoiding financial and economic impact;
- 3) enhancing preparedness to protect human health, safety, and welfare; and
- 4) restoring and protecting Maryland's natural resources and resource-based industries.

### Planning/Preparedness:

- Provides training for local government and links to support materials through its website

### Mitigation:

- Provides funding through grants

## i. Local Government

At the local level, county and municipal governments will often have an Office of Emergency Management, a Department (or Division of) Planning and Zoning, and a historic preservation commission, which may all participate in creating and implementing hazard mitigation plans and projects. The specific roles of each organization or group will vary based upon the local governmental structure, and they may be supported by other governmental departments and potentially nonprofit partners.

- Office of Emergency Management (OEM) – Responsible for conducting preparedness, response, recovery, and mitigation activities.
- Department of Planning and Zoning – Responsible for coordinating long-range planning through the development and implementation of a comprehensive plan. Enforces the zoning ordinance (which may address the treatment of properties in a historic district), processes building permits and reviews development proposals. If a community has a historic district commission, it is often housed under Planning and Zoning. A representative from Planning and Zoning is part of the planning team in updating the hazard mitigation plan. *(Refer to Planning & Preparedness, page 2.3.)*

Examples of emergency management activities typically conducted by an OEM include:

### Planning/Preparedness

- Educating and conducting outreach to communicate disaster/hazard event preparedness information to citizens, businesses, and communities
- Acting as team lead in the preparation of local hazard mitigation, Continuity of Operations, and Emergency Operations plans
- Conducting training and exercises to ensure the plans are functional and, if not, revise the plans
- Operating watch and warning systems

### Response & Recovery:

- Running the local Emergency Operations Center and taking the lead in incident management, and guiding and coordinating response and recovery efforts

### Mitigation:

- Serving as the leader for implementing the mitigation actions in the local hazard mitigation plan, and managing and conducting mitigation projects

## j. Local Volunteers

Although not formally part of the emergency management process, local volunteers, including historic preservation commissions, business associations and civic associations as well as nonprofit organizations and private citizens, can play a supporting role in all phases of the process, particularly in jurisdictions with limited governmental resources. Participation can also draw attention to areas of interest, such as the protection of cultural resources. *(Refer to Engage the Public, page 2.17.)*

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