Disaster Planning for Historic Properties

Integrating Hazard Mitigation and Historic Preservation in Pennsylvania

2015 Annual Conference
Westin Convention Center
1000 Penn Avenue, Pittsburgh
Sunday, October 18, 2015

Jeremy R. Young
Project Manager, Hurricane Sandy Recovery and Disaster Planning
The role of the SHPO is to identify and protect the architectural and archaeological resources of Pennsylvania. Our responsibility is to work with individuals, communities, local governments, and state and federal agencies to educate Pennsylvanians about our heritage and its value, to build better communities through preservation tools and strategies, to provide strong leadership, both individually and through partnerships, and to ensure the preservation of Pennsylvania’s heritage.
“To maintain our sense of place and quality of life, we must commit ourselves to making historic and cultural preservation an integral, indispensable part of living and working here. Lancaster County’s greatest assets are its historic buildings, landscapes, and cultural traditions – without them, the county loses its identity, and a part of America’s heritage goes with it.”
“Cultural and historical resources are an integral part of the overall quality of life in the county.”
“Historic preservation is an important element in the planning process because it ensures the legacy of not only the county’s but the nation’s, history for present and future generations. Preserving our historic resources is crucial to sustaining the quality of life that county residents enjoy.”
“Historic resources are a vital part of the county’s character, contribute to the county’s appeal as a tourism destination, and thus play an important role in the economy.”
“Lehigh and Northampton counties have a wealth of historic buildings, structures, sites and districts that...add to the beauty and attractiveness of the region, increase understanding and appreciation of our heritage, and improve the quality of life. Many significant historical features are of value to the local economy because they are tourist attractions.”
“As many of Huntingdon County’s communities are settled along rivers and creeks, flooding continues to be a threat to these historic towns, settlements, and other archaeological resources. Hazard mitigation planning should integrate these historic resources in the regular plan and plan updates.”
Kinzua Viaduct, Hamlin Township, McKean County

Destroyed by F-1 Tornado, 2003
Borough of Palmyra, Lebanon County
Threatened by Land Subsidence (Sinkholes), 2014
Hurricane Sandy
October 29, 2012
$1.5 million Grant Awarded to PHMC in 2014 is funding:

Disaster Recovery and Planning for Historic Properties

- Awarding subgrants to private property owners and nonprofit organizations for reimbursing the costs of repairing National Register-eligible or listed historic properties damaged by Hurricane Sandy.

- Undertaking municipal and county hazard mitigation planning to incorporate and prioritize historic properties.

- Developing model guidance and hazard mitigation demonstration projects related to historic properties.

- Providing training and educational programs on disaster-related topics.
Planning for Future Disasters
Prioritizing Historic Properties within the Disaster Cycle

Disaster Planning for Historic Properties Initiative
PHMC | State Historic Preservation Office, 2015-2017
Commonwealth of Pennsylvania
2013 State Standard All-Hazard Mitigation Plan

Approved:
October 18, 2013

Prepared for:
Pennsylvania Emergency Management Agency
2605 Interstate Drive
Harrisburg, PA 17110

Prepared by:
Michael Baker Jr., Inc.
1818 Market Street, Suite 3110
Philadelphia, PA 19103

Baker

State and Local Hazard Mitigation Plans
Disaster Mitigation Act of 2000

- Federal legislation amended the Robert T. Stafford Relief and Emergency Assistance Act

- Requires local jurisdictions to have hazard mitigation plans to be eligible for federal assistance following a disaster event

- **Emphasizes public participation** and coordination among state and local agencies

- **Encourages communities to continuously strive to improve their plans and resulting mitigation actions**

- The integration of historic properties into comprehensive mitigation planning is **critical to the spirit and intent of DMA 2000**
Why Prioritize and Plan for Historic Properties?

- They inform citizens of their unique local heritage, their cultural identity, and the origins of their community.
- They are the foundations of our communities’ built environment and they provide that familiar “sense of place”.
- They are very often valuable economic assets and tourism attractions.

The Importance of Preserving Historic Properties
Constitution of the Commonwealth of Pennsylvania

Article I, §27. The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania’s ... resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.
Phase I:
Identifying selected counties’ most hazard-prone historic properties through a carefully defined reconnaissance-level survey and recording hazard-specific information for vulnerability assessments

Phase II:
Developing strategies to protect these local historic assets during, and in the aftermath of, future natural disasters and integrating those strategies into select counties’ FEMA-approved hazard mitigation plans
The Disaster Planning for Historic Properties Initiative

“Pilot” Counties
“Historic Properties”

For local planning purposes, these may be defined as:

- Contributing to the community’s character
  - Ex: Local landmarks, residential neighborhoods

- Important economic development assets
  - Ex: Tourism destinations, downtown/village commercial districts, industrial buildings

- Meeting other local planning goals
  - Ex: County Comprehensive Plan (Municipalities Planning Code’s “plan for historic preservation” requirement)
“Historic Properties”

For federal and state law compliance purposes, these are more specifically defined as:

- Eligible for, or listed in, the National Register of Historic Places
- Various types
  - Buildings
  - Structures
  - Objects
  - Sites
  - Districts
- Archaeological sites

Definition of “Historic Properties”
Context of Hazard Mitigation Plan Integration
Integrating Historic Preservation & Hazard Mitigation:
Pennsylvania’s Guidance

- Developed a planning process to be used by Milton, Northumberland County, in future flood mitigation projects with the following goals:
  - Use the least intrusive techniques for the most historic buildings
  - Use a variety of techniques for different buildings
  - Eliminate as much risk as possible

- Only focused on flood hazards; not comprehensive in hazard scope
- Still very relevant and a good model
Integrating Historic Preservation & Hazard Mitigation: The Federal Guidance

- State and Local Mitigation Planning How-To Guide (FEMA 386-6)
  - Published by Federal Emergency Management Agency in 2005

- Comprehensive in its scope and covers a variety of hazards beyond flooding
Phase 1: Organize Resources

1. **Assess the level of awareness and support** for protecting your community’s historic properties, and **identify resources** for mitigating hazards to historic properties.

2. **Build the planning team**: identify and recruit historic preservation experts.

3. **Engage the public** during key points in the hazard mitigation planning process.
Phase 1: Organize Resources

Assess Awareness and Support for Protecting your Community’s Historic Properties—and Identify Resources

- What preservation efforts are currently underway in the community, and by whom?

- Does the community have a historic preservation plan or an historic district ordinance?
  - Comprehensive Plan “Historic Preservation Element”

- What are the obstacles to historic property preservation in the community?

- Identify resources (funding opportunities)
  - PHMC Keystone Preservation Grant Program
  - FEMA Pre-Disaster Mitigation Grant Program
Phase 1: Organize Resources

Build a Complete & Balanced Planning Team

- Historic preservation/heritage planners
- Preservation architects
- State, regional, and local historical societies
- Local, State, and Federal agencies that specialize in historic preservation and emergency management
  - PA Historic Preservation Office
  - PEMA
  - FEMA (HM, EHP Divisions)
- Businesses and Development Organizations for Historic Districts
  - “Main Street” organizations
  - Agricultural Preservation organizations
- Academia
Phase 1: Organize Resources

Engage the Public at Key Stages

- At “kick-off” to provide information about the planning process
- To understand what historic properties the community values
- At the conclusion of the risk assessment to report on findings
- During the development of goals and mitigation strategies/actions
- Throughout implementation of the plan
Phase 2: Assess Risks

1. **Identify hazards** that are likely to affect your community

2. Profile hazards to determine **hazard-prone areas** and the magnitude of each hazard

3. **Inventory historic properties** vulnerable to likely hazards by conducting field (re)survey for unknown resources and geospatial analysis of known resources
   - Assess vulnerabilities
   - Establish a hierarchy of community-driven preservation priorities

4. **Estimate** the associated amount of potential losses to historic properties ($)

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

State and Local Mitigation Planning How-To Guide

FEMA 386-6 / May 2005

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FEMA’s Guidance for Integrating Historic Preservation and Hazard Mitigation Planning

FEMA 386-6 (2005)
Phase 2: Assess Risks

Commonwealth of Pennsylvania
2013 State Standard All-Hazard Mitigation Plan

Approved: October 18, 2013
Prepared for: Pennsylvania Emergency Management Agency
Prepared by: Michael Baker Jr., Inc.

2013 State Standard All-Hazard Mitigation Plan
Commonwealth of Pennsylvania (PEMA)
Phase 2: Assess Risks
Phase 2: Assess Risks

Mocanaqua Historic District
Conyngham Township, Luzerne County
Phase 2: Assess Risks

Inventory Historic Properties

- Document properties as comprehensively as possible and record:
  - Primary building materials and structural system
  - Current physical condition
  - Building features that may be susceptible to local hazards
  - Character-defining architectural details
  - Market and Assessed Value ($)
  - Hazard-specific information
    - Ex: Building elevation in flood-prone areas

Field Survey to Document Hazard-Prone Historic Properties
PHMC’s Hazard-Specific Historic Resource Survey Form
## Phase 2: Assess Risks

### Building Data Requirements by Hazard

<table>
<thead>
<tr>
<th>Building Characteristics</th>
<th>Flood</th>
<th>Earthquake</th>
<th>Tsunami</th>
<th>Tornado</th>
<th>Coastal Storm</th>
<th>Landslide</th>
<th>Wildfire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Type/Type of Foundation</td>
<td></td>
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<tr>
<td>Building Code Design Level/Date of Construction</td>
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<tr>
<td>Roof Material</td>
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<tr>
<td>Roof Construction</td>
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<td>Vegetation</td>
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<tr>
<td>Topography</td>
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<tr>
<td>Distance from the Hazard Zone</td>
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</tbody>
</table>

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Relationship of Building Characteristics to Hazard Types

FEMA ‘How-To Guide’ 386-6
Phase 2: Assess Risks

Collect Building Elevation Information

- Many buildings constructed before 1975 (most historic buildings) do not have flood Elevation Certificates
  - **“Pre-FIRM” building**: A building for which construction or substantial improvement occurred on or before December 31, 1974, or before the effective date of an initial Flood Insurance Rate Map (FIRM).

- Elevation Certificates:
  - Help property owners demonstrate compliance with local floodplain ordinances
  - Provide the information necessary for insurers to determine proper flood insurance rates
Collecting Building Elevation Data for Historic (Pre-FIRM) Buildings

PHMC's Hazard-Specific Historic Resource Survey Form
Phase 2: Assess Risks

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Hazard Mitigation Integration Pilot Project, City of Philadelphia
Phase 2: Assess Risks
Phase 2: Assess Risks

Storm Surge Inundation (SLOSH Maximum of Maximums)

This web map displays a seamless national map of near worst case storm surge flooding (inundation) scenarios using the National Weather Service (NWS) SLOSH model maximum of maximums (MOMs) product for different hurricane wind categories at a high tide.

Category 4 Storm Surge Inundation (SLOSH Maximum of Maximums)

With this education and awareness tool, anyone living in hurricane-prone coastal areas along the U.S. East and Gulf Coasts can now evaluate their own unique risk to storm surge. This map makes it clear that storm surge is a significant concern for many areas.

Legend

- Category 4 (SLOSH MOMs)
- Storm Surge Inundation
- Inundation Depth
- Up to 3 feet above ground
- Greater than 3 feet above ground
- Greater than 6 feet above ground
- Greater than 9 feet above ground
- Levee Areas - Consult Local Officials For Flood Risk

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Hazard Mitigation Integration Pilot Project, City of Philadelphia
Phase 2: Assess Risks

Registered Historic Buildings at Risk: Various Flood Inundation Scenarios
City of Philadelphia

Total Estimated Floodprone Registered Historic Buildings, Citywide: 1,052

Disaster Planning for Historic Properties Initiative
Hazard Mitigation Integration Pilot Project, City of Philadelphia
Phase 2: Assess Risks

Registered Historic Buildings At Risk: Various Flood Inundation Scenarios*
Central Plan District, City of Philadelphia

Disaster Planning for Historic Properties Initiative
Hazard Mitigation Integration Pilot Project, City of Philadelphia
### Phase 2: Assess Risks

Table 1. Estimated total number of historic buildings* in each of the various identified flood hazard areas in Philadelphia (citywide).

<table>
<thead>
<tr>
<th>Estimated Number of Historic Buildings in...</th>
<th>Historic Building Designation Type</th>
<th>National Historic Landmark (NHL) Listed Buildings*</th>
<th>National Register Listed Historic Buildings*</th>
<th>Philadelphia Register Listed/Locally Designated Historic Buildings*</th>
<th>TOTAL Historic Buildings** (NHL-Listed* OR Listed in National Register* OR Listed in Philadelphia Register*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>...100-Year Flood Inundation Areas***</td>
<td></td>
<td>15</td>
<td>412</td>
<td>164</td>
<td>481</td>
</tr>
<tr>
<td>...500-Year Flood Inundation Areas***</td>
<td></td>
<td>20</td>
<td>914</td>
<td>444</td>
<td>1,036</td>
</tr>
<tr>
<td>...Category-1 Hurricane Surge Inundation Areas***</td>
<td></td>
<td>0</td>
<td>34</td>
<td>38</td>
<td>50</td>
</tr>
<tr>
<td>...+2 ft. Sea Level Rise Inundation Areas***</td>
<td></td>
<td>1</td>
<td>20</td>
<td>23</td>
<td>31</td>
</tr>
<tr>
<td>...+4 ft. Sea Level Rise Inundation Areas***</td>
<td></td>
<td>1</td>
<td>69</td>
<td>26</td>
<td>80</td>
</tr>
<tr>
<td>...+6 ft. Sea Level Rise Inundation Areas***</td>
<td></td>
<td>3</td>
<td>133</td>
<td>32</td>
<td>150</td>
</tr>
</tbody>
</table>

*Including buildings of individual merit and buildings contributing to an historic district.

**Buildings may have more than one type of historical designation. For example, a building may be listed in the National Register of Historic Places and may also be listed locally in the Philadelphia Register of Historic Places.

***Buildings may be located within more than one type of flood inundation area. For example, a building may be vulnerable to inundation from a 100-year flood as well as from more regular flooding from high tides due to projected sea level rise.

* As identified by National Flood Insurance Program (NFIP) of the Federal Emergency Management Agency.

b As identified by the "Sea, Lake, and Overland Surge from Hurricanes" (SLOSH) model of the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service.

c As identified by the "Sea Level Rise Impacts" model of the NOAA’s Coastal Services Center.
Phase 2: Assess Risks

Establish a Preservation “Hierarchy”

- Prioritize historic properties for mitigation
  - Which properties would the community miss most if destroyed by disaster?
  - Public input is critical to identifying and prioritizing these properties

- Hierarchy of historic properties will inform mitigation action priorities in Phase 3

- Variables that may influence preservation priorities:
  - Public sentiment
  - Economic importance
  - Level of historical/cultural significance
  - Integrity
Phase 2: Assess Risks

Estimate Historic Building Replacement Costs

- Difficult to place a dollar value on elaborate and unique craftsmanship of historic buildings, but these estimations are necessary to understand cost-effectiveness of various hazard mitigation alternatives.
- Modern-day industry standards (RSMeans) for construction costs recommended—PLUS a multiplier (20% to 25%) for historic buildings.
- Qualified preservation architect or historic building rehabilitation contractor can assist with these estimations.
Phase 3: Develop a Mitigation Plan

1. Develop mitigation goals and objectives for your historic properties based on your community’s preservation priorities/hierarchy

2. Identify, evaluate, and prioritize actions

3. Prepare an implementation strategy

4. Document the mitigation planning process and public input
Phase 3: Develop a Mitigation Plan

Alternatives to Demolition and Relocation

- Pennsylvania’s early settlement patterns have resulted in many flood-prone historic communities.

- Acquisition/demolition most commonly funded flood mitigation technique for repetitive loss properties.

- What alternatives may minimize risk without compromising the integrity and historic fabric of your community?
Phase 3: Develop a Mitigation Plan

Identify appropriate and cost-effective mitigation actions

- Consider the impacts of actions on historic buildings
  - Appearance
  - Setting
  - Scale

- Benefit-Cost Analysis (BCA)
  - How does the cost of implementation compare to the amount of damage it would prevent?
International Best Practices for Historic Property Flood Mitigation
# Risk Reduction vs. Level of Impact to Historic Properties

<table>
<thead>
<tr>
<th>Flood Mitigation Alternative</th>
<th>Reduction of Risk</th>
<th>Level of Impact to Historic Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition &amp; Demolition</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Relocation</td>
<td>High</td>
<td>Medium to High</td>
</tr>
<tr>
<td>Elevation</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Dry Floodproofing</td>
<td>Low to Medium</td>
<td>Low to Medium</td>
</tr>
<tr>
<td>Wet Floodproofing</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Stream Channel Improvements</td>
<td>Low</td>
<td>High (for Archaeological Resources)</td>
</tr>
<tr>
<td>Levees &amp; Floodwalls</td>
<td>Medium</td>
<td>Medium</td>
</tr>
</tbody>
</table>

*Looking to the Future: Alternatives for Reducing Flood-Related Damage in Historic Communities*

PHMC/PEMA/FEMA/Borough of Milton, 2002
Phase 4: Implement the Plan and Monitor Progress

1. **Required regulatory review**
   - Section 106 of the NHPA
   - Pennsylvania History Code

2. **Apply for grants to implement historic property actions**

3. **Update your historic property inventory data**
   - Submit data request to SHPO for CRGIS updates every 5 years

1. **Evaluate and update your plan**
   - FEMA requires every 5 years
   - Consult PEMA Standard Operating Guide for new historic/cultural resource checklist items
Disaster Planning for Historic Properties
Integrating Hazard Mitigation and Historic Preservation in Pennsylvania

Questions?
Disaster Planning for Historic Properties
Integrating Hazard Mitigation and Historic Preservation in Pennsylvania

Thank You

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