Flood Adaptation for Historic Buildings

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Roles and Responsibilities

Federal

- FEMA/NFIP
- NPS/National Standards & Guidelines

State

- State EMA
- SHPO/State Guidelines

Local

- Ordinances/Floodplain Managers
- Local Guidelines/Architectural Review Boards

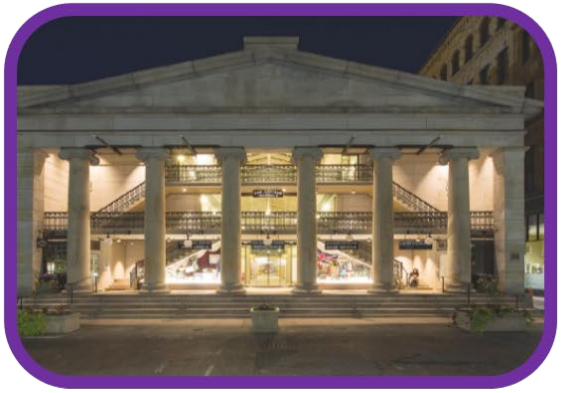
Framing the Issue

- **Natural threats**
  - New trends
  - Increased intensity
- **Economic threats**
  - Raising insurance rates
  - Loss of real estate value
  - Cost of damage
- **Political threats**

Secretary's Standards for the Treatment of Historic Properties

Preservation

Restoration



Rehabilitation

Reconstruction

Publication Series

The Secretary of the Interior's Standards

Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings

Preservation Briefs

Interpreting the Standards Bulletins

Preservation Tech Notes

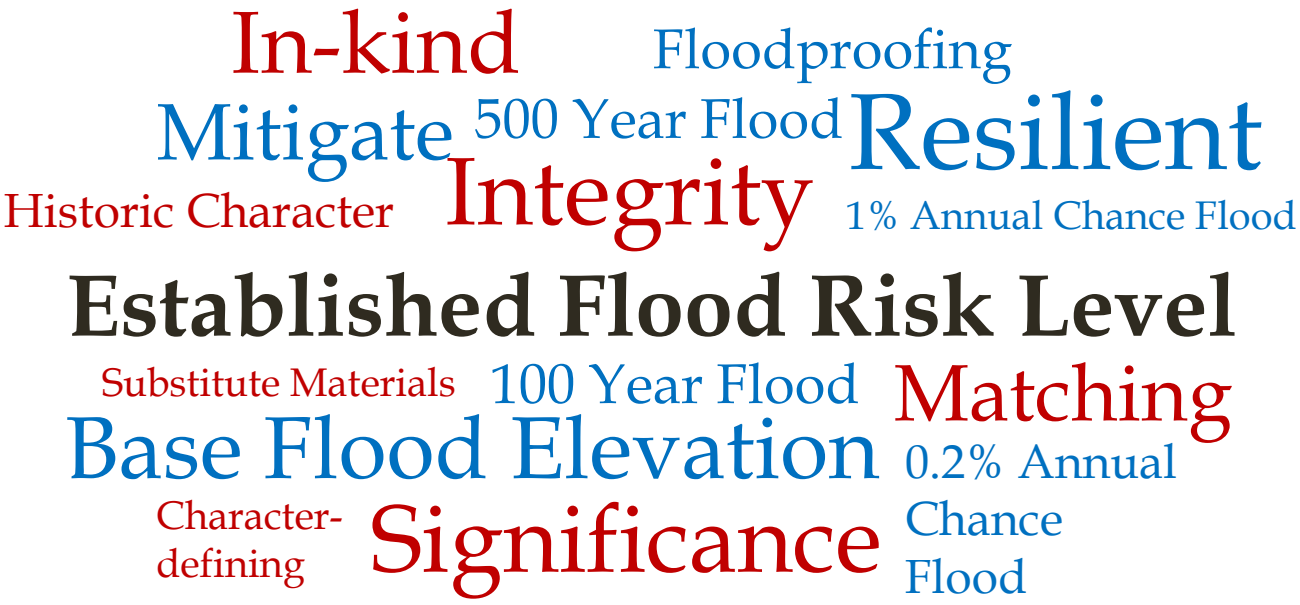
Flooding Guidelines

Available online now!

Applying the Flood Guidelines

- **Must have a flood risk, based on empirical evidence**
- **Understand and identify flood characteristics AND property characteristics**
- **Different/alternative treatments found acceptable**

Jargon


In-kind
Floodproofing
Mitigate
500 Year Flood
Resilient
Historic Character
Integrity
1% Annual Chance Flood
Established Flood Risk Level
Substitute Materials
100 Year Flood
Matching
Base Flood Elevation
0.2% Annual
Character-defining
Significance
Chance Flood

Decision Making Process, It's a Process

1. Identify risk
2. Monitor conditions
3. Document historic resources
4. Review and understand applicable codes and regs
5. Assess feasible adaptation treatments
6. Make a treatment decision
7. Consult stakeholders
8. Implement and/or reevaluate

Identify the "High Level" Risk(s)

- Flood
- Wildfire
- Windstorms
- Increased Temperature
- Heavier precipitation
- New pests
- Higher water table
- Decreased humidity
- Etc.

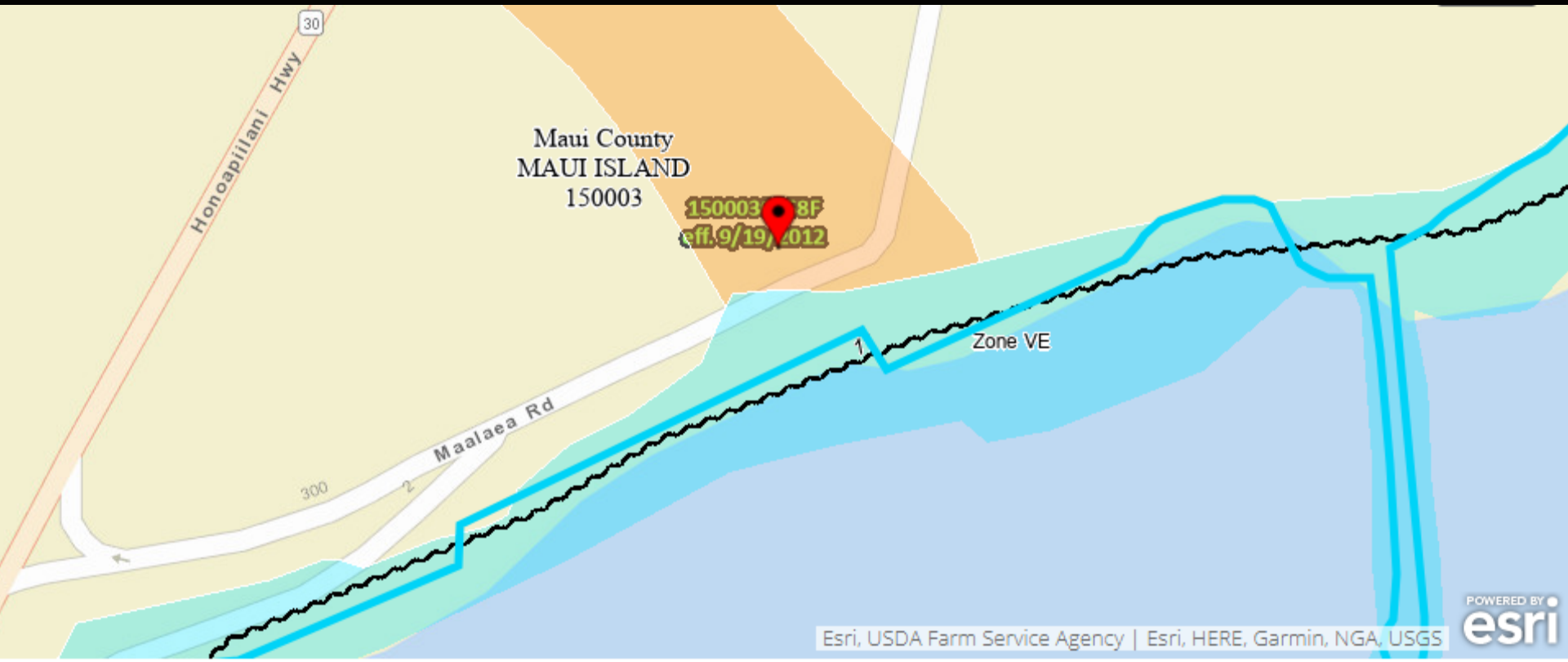
Identify Vulnerabilities and Resilience

- Which parts of the site, setting, and building are most at risk to damage?
- Is there existing capacity for resilience?

Monitor condition & reevaluate

Document the building, site, landscape, etc.

Review and understand applicable codes



PIN
- Approximate location based on user input and does not represent an authoritative property location

MAP PANELS
- Selected FloodMap Boundary
- Digital Data Available
- No Digital Data Available
- Unmapped
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

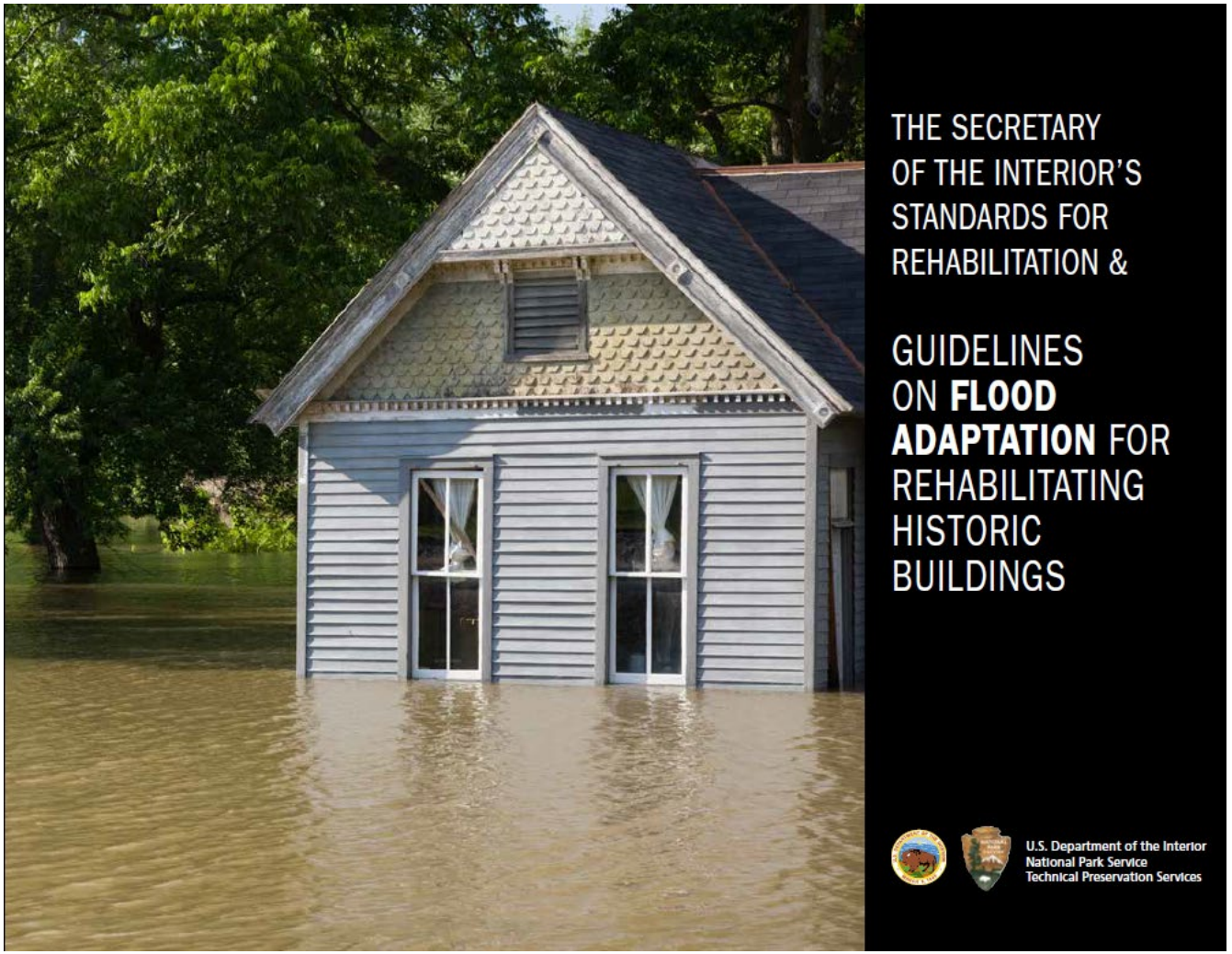
SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

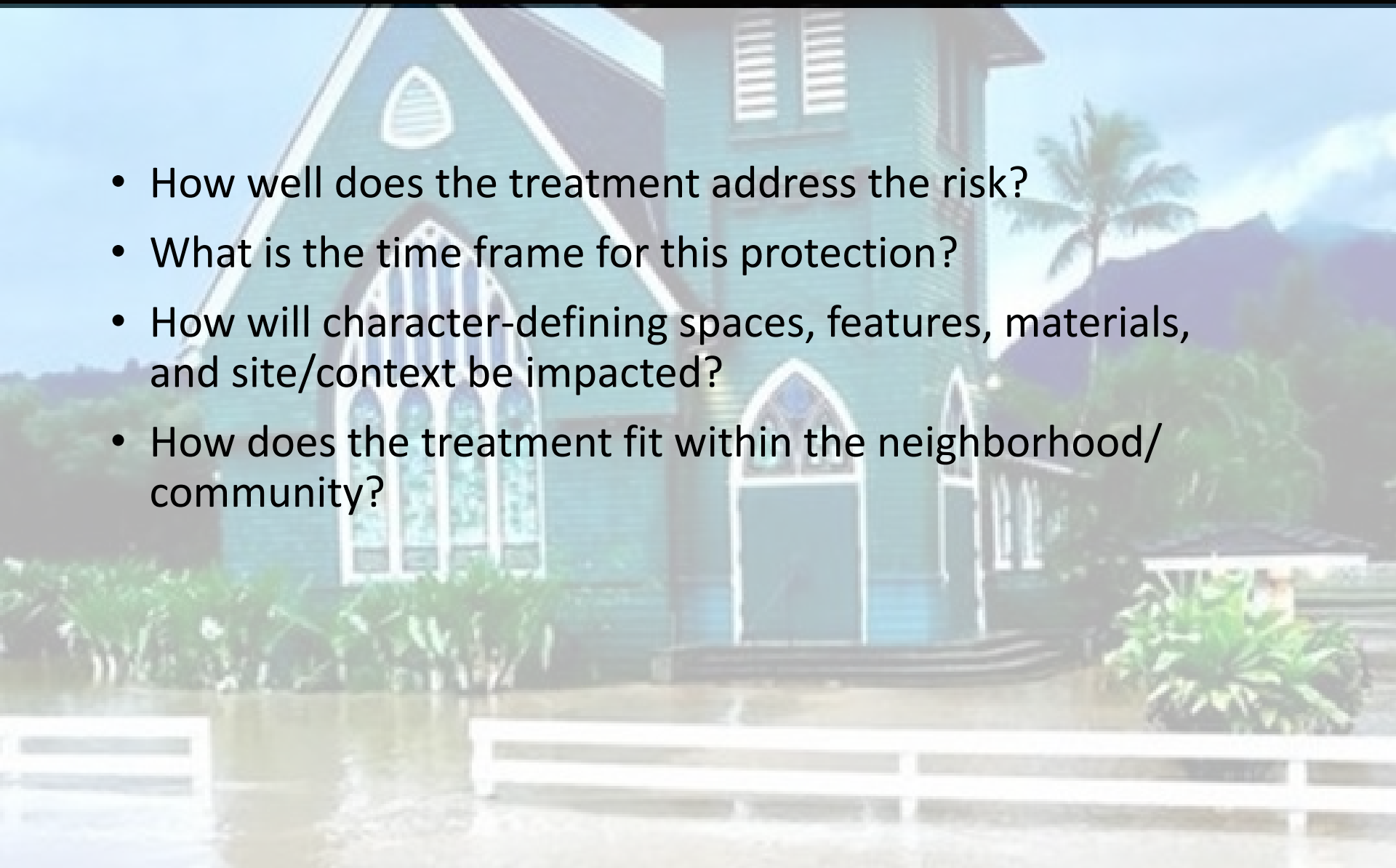
OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

Assess feasible adaptation treatments



Assessment criteria



- How well does the treatment address the risk?
- What is the time frame for this protection?
- How will character-defining spaces, features, materials, and site/context be impacted?
- How does the treatment fit within the neighborhood/ community?

Make a treatment decision

Consult stakeholders

- Involve all stakeholders, as appropriate.
- Obtain necessary approvals, permits, etc.
- Be prepared to communicate factors and limitations that helped lead to a particular treatment decision.

Implement treatment decision

Evaluate for intended resiliency

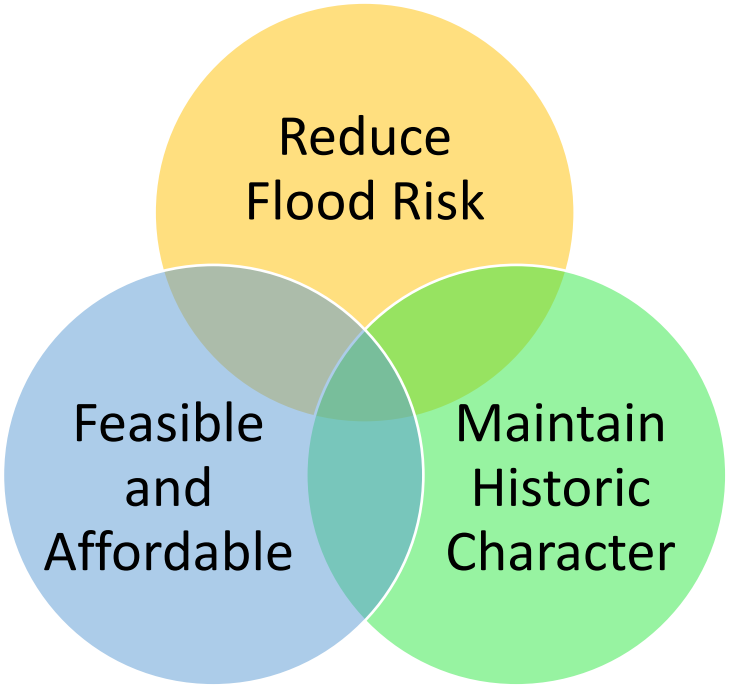
Adaptation Treatments

Protect Utilities
Landscaping, consider nature based
Unconventional

Keep Water Out:
Temporary Measures
Dry Floodproofing

Let Water In:
Wet Floodproofing
Elevate Interior
Abandon the Lowest Floor

Avoid:
Fill the Basement
Elevate Foundation
Move



Fortify – Keep Water Out

- Temporary barriers
- Permanent site structures
- Structural enhancements and waterproofing building envelope

Adapt to Reduce Damage – Let Water In

Source: City of Davenport, Iowa

Source: Galveston Historical Foundation

- Use flood-damage-resistant materials
- Elevate internally on platforms
- Abandon the lowest floor level

Relocate – Avoid the Flood

- Elevate above flood waters
- Move the building

Unconventional Adaptations

- Amphibious design
- Living shorelines

Cultural Resources, Partnerships, & Science

National Park Service
U.S. Department of the Interior