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• **PIE** is the result of an agreement between APA and FEMA, with ASFPM as partner, to produce a series of educational webinars on best practices in hazard mitigation planning.

• Webinars revolve around 4 central themes:
  • Focus on all hazards.
  • Focus primarily on mitigation planning but also its connections with recovery planning and preparedness.
  • APA and ASFPM act as co-conveners of all planning exchange webinars.
  • Planning exchange hosts will select topics and commit to moderate, present, and lead the planning exchange webinars.
Today’s Presentation

I. Overview and the Standards
II. Regulations
III. Community Associations and Planning Assumptions
IV. Q&A
Poll Question 1
The Problem:

Flood losses are increasing
- Now average over $10 billion/year
- Extreme events appear to be getting more frequent
- We are not getting ahead of development, adding 5,000+ rep loss properties/year.
- We’ve not mapped all flood hazard areas

Most communities’ subdivision standards are inadequate to ensure that
- All flood hazard areas on a tract of land are identified;
- Infrastructure is protected and resilient;
- Flooding potential on the site and adjacent areas has not increased; and
- Natural floodplain functions are protected, enhanced, or preserved.

Credit: Chopperguy Photographer Jerry Ferguson and Pilot Andrew Park
Origins of Current Project

• Need to update 1997 guidance in PAS Report No. 473, *Subdivision Design in Flood Hazard Areas*

• Opportunity to partner with Association of State Floodplain Managers to incorporate flood expertise and reach broader audience

• Opportunity to address new issues like climate change

No Adverse Impact (NAI) and natural and beneficial floodplain functions
Subdivision Design in Flood Hazard Areas: General Principles

1. Maintain Natural and Beneficial Functions of the Floodplain
2. Adopt a No Adverse Impact Approach to Floodplain Management
3. Avoid New Development in the Floodplain Whenever Feasible
4. Focus on Data-Driven Decision Making, Using the Best Available Data to Assess Risk and Inform Decisions
5. Consider Future Conditions of the Floodplain Including Development Impacts and Climate Change
Subdivision Design in Flood Hazard Areas: Planning and Design Principles

1. Communicate with and inform stakeholders and community members throughout the planning and design process in order to facilitate coordination and community buy-in

2. Apply multiple tools and techniques for ‘avoidance of the floodplain’ (restricting new development in the floodplain and if necessary, relocation of existing structures) and ‘resistance to flooding’ (taking actions to resist inundation, such as dry proofing, elevation, levees, etc.)

3. Allow for creativity in design, and, where possible, adopt a ‘watershed-scale approach’ to design and an ‘ecosystem-based approach’ to disaster risk reduction
4. Design new and adapt existing infrastructure, including stormwater facilities and transportation networks, to be resilient to both high- and low-frequency flooding events
5. Protect open space and incorporate green infrastructure into development patterns
6. Ensure that subdivision and related development regulations include provisions for enforcement personnel
The Process of Subdivision Design in Flood Hazard Areas

Routine activities of the Planning Department

• Ensure FPM capability (require CFM as condition of hire)
• Obtain and make available all flood risk information
• Proactive outreach to all, especially Owners Associations
The Process of Subdivision Design in Flood Hazard Areas

**Sketch Plan**
- Require good topo if you don’t already have it
- Ensure all existing easements/covenants are identified (i.e., properties with hazard mitigation related deed restrictions)

**Preliminary Plan**
- Ensure H&H and stormwater studies reviewed by a competent engineer
- Ensure rigorous variance criteria for flood related standards (use same standards that are in FPM codes)
The Process of Subdivision Design in Flood Hazard Areas

Final Plat
• Show flood risk information on final plat
• Physical monumentation of flood boundaries

Post Approval Management
• Who is maintaining stormwater infrastructure? Is it community or an OA?
The Standards

Natural and Manmade Geographic Features

• Require mapping of the 100-year floodplain and floodway for any area that could hold or convey water where a floodplain has not already been mapped
• Require and maximize width of riparian buffers (research shows ranges from 10 to 500 feet)
• Require dam and levee failure inundation zones on preliminary plans and plats
• Prohibit change of dam classification unless developer helps finance cost of dam upgrade
The Standards

Layout and Design

• Ensure that floodplain areas are non-buildable, either as laid out as areas that are non-buildable on lots, or set aside as reserve areas entirely (not contained within lots)

• A No Adverse Impact standard for evaluating and mitigating most/all physical and ecosystem impacts of development and/or impacts on critical habitat

• The surface of new streets within subdivisions shall be built to at least the 100-year flood elevation

• Include use standards such as prohibition of hazardous uses/critical facilities.
The Standards

Infrastructure

• Size culverts and bridges to convey 100-year storm
• Prohibit OAs from maintaining stormwater and flood protection infrastructure
• Locate utility easements outside of the floodplain where possible

Platting

• Show flood elevation data (100-year, building pad elevations) on plats
• Require permanent markers of flood boundary
The Standards

Watershed Management

Require green infrastructure and low impact development techniques in both stormwater management and roadway design sections of subdivision regulations

Require post-development peak storm flows and runoff for the 100-year or less frequent storm be no higher than was the case prior to development

Require retention and detention facilities based on the 24-hour, 100-year storm

Prepare a habitat assessment to demonstrate that any subdivision development activities will not adversely impact the habitat and species it supports and describe any appropriate mitigation measures taken
Poll Question 2
SUBDIVISION STANDARDS

The Hippocratic Oath for Practitioners: Do No Harm
Initial Regulations

Floodplains Delineated on Parcels
On-Lot Hazard Notifications
On-Lot Hazard Notification Realized
On-Lot Floodplain Marker
Enhanced Regulations
No On-Lot Floodplains
Enhanced Regulations
Riparian Buffer
Compensatory Storage
Recorded Easement
Open Space Management Plan

KEY FEATURES

- Describe open space /conservation areas
- Identify priority areas for protection
- Allocate responsibility for operation and maintenance of open space
- Estimate cost of O&M and means by which funds will be obtained or provided
- Provides for enforcement of Management plan
- Provide that Open Space Management Plan is binding on all responsible parties
- Be officially recorded with the county Recorder
- Identify how and by whom plan will be enforced
EXAMPLE OPEN SPACE PLAN

NOTE: THIS IS A GRAPHICAL REPRESENTATION ONLY.
LOCAL REGULATION REQUIREMENTS MUST BE FOLLOWED.
Poll Question 3
Flood Control Facilities and Community Associations

Three Planning Assumptions to Examine
Community Associations and the Planning Process

- Collection of data and review of threats
- Approval of proposed mitigation
- Inspection of the construction of critical facilities
- Does planning include assessment of the ability of the owner to maintain critical facilities over the long term?
- A community association requires that certain assumptions be challenged at the onset
Assumption #1

A community association has an infinite life with owner self-assessments as the primary (or only) funding source.

• Many Community Associations have a limited service life depending on funding.

• Downward pressure on assessments by owners

• Short term vs. long term interests result in inadequate reserve funding.—what happens to the facilities when they fail?

• Critical when association is responsible for infrastructure necessary for public safety
Assumption #2

A community association has the expertise (or knows how to get it) to maintain critical facilities

- No staff engineers or facilities managers
- Managed by volunteer board members helped by community managers
- Managers can handle routine maintenance of non-critical components
- Managers and Board members lack the expertise to manage critical facilities
- Public entities play no role in community association management
Assumption #3

The owners of a community association will assess themselves as necessary to properly maintain critical facilities

- Reliance on developer or seller disclosures for cost of ownership
- Limited understanding of critical facilities cost of maintenance
- Assessment calculations incomplete or inaccurate
- No budget for disaster repair
- Owners unprepared for cost of maintenance or repair of critical facilities
- Rejection of additional assessments
Questions to Ask

Will a community association facility be part of a regional flood control plan?

Private lake as holding pond?

Levees protecting more than one subdivision?

Will a public entity assume responsibility if the community association lacks the funds to repair a critical facility?
Conclusion and Solutions

Is the assumption important to the planning decision?

If a critical assumption is found to be faulty, should planners challenge the developer to provide a solution?

Special Districts or municipal ownership as an alternative to community association responsibility for critical facilities.