Breaking the Disaster Cycle and Minimizing Damages through Collaboration and Planning

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FEMA Mitigation Planning

RiskMAP
Increasing Resilience Together
Presentation Overview

- EPA/FEMA Memorandum of Agreement (MOA)
- Overview of Mitigation Planning
  - Planning Process
  - Risk Assessment Data and Tools
  - Mitigation Resources
- Links to Long Term Recovery Planning
  - Post-disaster opportunities to rebuild more safely
- Looking Towards the Future
- EPA/FEMA Projects Under the MOA
EPA/FEMA Memorandum of Agreement

Overall Goals:

- **Enhanced Agency Coordination** for both Headquarters and Regional offices of both agencies
- **Smart Growth Assistance to local governments** recovering from recent disasters or working to mitigate future disasters
- **Community Resiliency and Climate Change Adaptation** that coordinates agency activities as appropriate through Smart Growth, recovery and mitigation planning programs
- **Cross-Training and Joint Training** at the national, regional, and local, and Tribal levels
Creating Resilient and Sustainable Communities

- FEMA – EPA partnership
- State and community disaster recovery
- Accommodating the next increment of growth
- Overlapping outcomes
  - Economic
  - Environmental
  - Community
  - Public Health
- Projects identified – more to come
  - Iowa, Kansas, Spirit Lake Nation
Introduction to Hazard Mitigation

Mitigation
Sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects

Recovery
Putting a community back together after a disaster

Preparedness
Getting people and equipment ready to quickly and effectively respond to a disaster

Response
Saving life and property during and immediately after a disaster
Mitigation Saves Lives and Protects Property
Hazard Mitigation

- Sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects
- Mitigation actions have a **long-term** impact
- Mitigation actions are different from:
  - Preparedness for an impending event
  - Immediate response to an event
  - Short-term recovery from an event
Benefits of Mitigation Planning

- Ongoing planning process can help raise risk awareness and reduce disaster losses
  - Citizens and Tribal members can learn more about what to do now to protect its members and assets, and minimize risk in the future (new development)

- May develop or update plan to identify high risk areas for planning
  - Data can also assist with emergency management

- Mitigation planning can be combined with other ongoing planning and risk reduction processes
  - Floodplain management, watershed management, comprehensive planning, building codes, zoning, etc.

- Access resources available in the recovery process to rebuild to mitigate future losses
  - Better positioned to apply for grant and project funds with an approved plan if a disaster affects a jurisdiction

- Mitigation is cost-effective; save $4 for every dollar spent
## Mitigation Plan Requirements for FEMA Assistance

<table>
<thead>
<tr>
<th>Program</th>
<th>State</th>
<th>Local</th>
<th>Tribal</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>No Mitigation Plan Requirement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA (A-B)</td>
<td>No Mitigation Plan Requirement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA (C-G)</td>
<td>✓</td>
<td></td>
<td>✓ (ONLY if Grantee)</td>
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<tr>
<td>FMAG</td>
<td>✓</td>
<td></td>
<td>✓ (ONLY if Grantee)</td>
</tr>
<tr>
<td>HMGP ($)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>PDM ($)</td>
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<tr>
<td>FMA ($)</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>SRL</td>
<td>✓</td>
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<td>✓</td>
</tr>
<tr>
<td>RFC</td>
<td>✓</td>
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<td></td>
</tr>
</tbody>
</table>

($) funding may be available for mitigation planning
Mitigation Planning Process

- Encourage sound decision-making based on a good understanding of hazards and vulnerabilities; and stakeholder values and priorities
Organize Resources

- **Assess support and capabilities; technical and financial resources**
  - Other Federal, State, local, or Tribal agencies, public/private sector, nonprofits, academia, regional planning agencies, professional associations

- **Engage the public**
  - Provide multiple opportunities for public participation throughout the planning area
  - Educate the public about hazards and mitigation actions

- **Build a planning team**
  - Identify dedicated and interested individuals to be on the planning team
Risk Assessment

- Process of measuring the potential for property damage, economic loss, injury, or death that may result from a hazard event
- There are four steps to completing a risk assessment
- The risk assessment provides the factual basis for mitigation actions proposed in the plan
Hazards to Consider

- Avalanche
- Coastal Erosion
- Coastal Storm
- Dam Failure
- Drought
- Earthquake
- Expansive Soils
- Extreme Heat
- Hailstorm
- Land Subsidence
- Landslide

- Riverine Flooding
- Ice Storm
- Sinkholes
- Storm Surge
- Tornado
- Tsunami
- Volcano
- Wildfire
- Windstorm
- Others?

Even if a State, Tribe, or community has not been affected by a hazard in several years, but if that hazard is possible, then it is relevant and must be addressed in the plan.

Multi-jurisdictional plans must address each hazard that might affect any part of each jurisdiction involved in the plan.
Vulnerability

- Vulnerability is susceptibility to damage or economic loss
- Depends on location, construction, and contents
  - Location (e.g., in a floodplain, on steep hillside)
  - Construction (e.g., elevated, meets building code)
  - Contents (e.g., antiques, important documents)
- Helps communities decide what to do and how to be safer and more resilient from disasters
Example Vulnerability Assessment

<table>
<thead>
<tr>
<th>Type of Structure (Occupancy Class)</th>
<th>Number of Structures</th>
<th>Value of Structures</th>
<th>Number of People</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># in Community or State</td>
<td># in Hazard Area</td>
<td>% in Hazard Area</td>
</tr>
<tr>
<td>Residential</td>
<td>61</td>
<td>16</td>
<td>25%</td>
</tr>
<tr>
<td>Commercial</td>
<td>5</td>
<td>4</td>
<td>80%</td>
</tr>
<tr>
<td>Industrial</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Agricultural</td>
<td>2</td>
<td>1</td>
<td>50%</td>
</tr>
</tbody>
</table>

Source: FEMA 386-2 Understanding Your Risks: Identifying Hazards and Estimating Losses
Collect Additional Building Data

- Age of building
- Square footage
- Function
- Content value
- Occupancy (and variation by time of day/season)
- Displacement cost
- Explain process for gathering data
- Identify data limitations

Source: FEMA 386-2 Understanding Your Risks: Identifying Hazards and Estimating Losses
Estimate Losses

- Estimate how assets will be damaged by a typical hazard event
- Loss estimation tables have been developed based on past damages
- Provided for flooding in How-To Guide (FEMA 386-2, pages 4-13 to 4-15)
  - Percent damage to structures
  - Percent damage to contents
  - Functional downtime is average time (in days) that a business will be disrupted by a hazard event
  - Displacement time is average time (in days) that business must operate from a temporary location
Develop the Mitigation Strategy

- Focus on the **most damaging** hazards and the **most vulnerable** assets
- Clarify problems, issues, and opportunities for hazard mitigation
- Engage the public
- Define goals and objectives that are related to potential impacts
- Identify and prioritize actions
- Consider capabilities and resources
Mitigation Project Examples

- **Voluntary acquisition of property for conversion to open space (in perpetuity)**
  - The planning process provides a good review process to develop and build support for this type of project
- **Demolition or relocation of high-risk buildings**
- **Elevation of existing structures to avoid flooding**
- **Structural and non-structural retrofitting (e.g., storm shutters, hurricane clips, bracing systems) to meet or exceed applicable building codes**
- **Construction of safe rooms**
- **Protective measures for infrastructure and utilities**
- **Storm water management projects**
- **Localized flood control projects to protect critical facilities**
Adopt and Implement the Plan

- Adopt the mitigation plan
- Implement the plan
  - Evaluate planning results
  - Monitor progress
- Incorporate other planning mechanisms
- Keep the public involved
- Revise/update the plan
Monitor Actions

- Review actions to determine if they are being implemented
- Identify milestones and a timeline
- Document progress
- Responsible parties should report on their progress periodically
Cedar Rapids, Iowa

Working Our Plan: Cedar Rapids Flood Recovery & Reinvestment

1. Improve Flood Protection
   - We will strengthen the protection of our homes, businesses, and public facilities against future flooding.
   - Three-year, three-part flood management strategy includes:
     - Temporary barriers to reinforce current levees
     - Construction of a permanent system of floodwalls and levees
     - Pumps to improve state-wide flood management policies

   **PROGRESS:**
   - 2.36 miles - length of temporary barriers purchased to reinforce current levees
   - $100,000 - cost of temporary barriers
   - 24 feet - increased height of current levees with temporary barriers
   - 63 property owners provided input on permanent flood management system
   - $1 billion - estimated cost of permanent systems of floodwalls and levees
   - 120 days - time to think to create new Flood Management Plan for permanent flood protection

   This is a sample of one of the 197 homes that will be built in Cedar Rapids in the future.

2. Reinvest in Housing, Businesses, and Neighborhoods
   - We are reinvesting in the neighborhoods and business districts around the Cedar River to create vibrant centers for our kids, grandkids and the next generation workforce.

   **PROGRESS:**
   - $200 million - permanent funds invested in 1,750 households
   - 14 - new homes built to replace the houses lost to flooding, so far
   - 1,400 - number of residents who participated in the creation of the Neighborhood Reinvestment Area Plan
   - 450 - small businesses reopened after the flood, so far

   - 80 million - permanent funds invested in rebuilding 800 businesses
   - 120 days - the time it took to create a Neighborhood Reinvestment Area Plan for 15 neighborhoods

   - This is a sample of one of the 197 homes that will be built in Cedar Rapids in the future.

3. Rebuild Public Facilities
   - We will rebuild and repair the flood-damaged City facilities with a focus on customer service needs and sustainable construction standards that will last for decades to come.

   **PROGRESS:**
   - 210 - number of City facilities damaged by the flood
   - 44 - number of public facility rebuilding projects submitted for FEMA funding
   - $500 million - estimated cost of rebuilding and repairing all damaged City facilities
   - 11 - number of public facility rebuilding projects expected to begin in 2009
   - 3 - number of open houses planned for the summer of 2009 to gather feedback on rebuilding community facilities
FEMA Tools and Training

- HAZUS-MH
- RiskMAP Flood Hazard Data
- Building Codes and Engineering Standards
  - National Earthquake Hazards Reduction Program
- Mitigation Planning Guides
- Floodplain Management Publications
- Recovery Planning Information
- Emergency Management Institute Courses
Estimate Losses

- Estimate how assets will be damaged by a typical hazard event

- HAZUS-MH (Hazards U.S. Multi-Hazards) is GIS-based software from FEMA used to inventory assets and estimate damages from flood, earthquake, and hurricane winds

- HAZUS-MH allows user to:
  - **Identify** vulnerable areas
  - **Assess** level of readiness and preparedness
  - **Estimate** potential losses from specific events
  - **Decide** how to allocate resources
  - **Prioritize** mitigation measures
  - **Simulate** mitigation measures
Risk MAP

Through collaboration with State, Local, and Tribal entities, Risk MAP will deliver quality data that increases public awareness and leads to action that reduces risk to life and property.
Flood Risk Datasets

- Changes Since Last Flood Insurance Rate Map
- Flood Depth & Analysis Grids
- Flood Risk Data (including digital products)
- Areas of Mitigation Interest (helps with planning)

RiskMAP
Increasing Resilience Together
Changes Since Last FIRM

Unchanged

SFHA Increase

Unchanged

SFHA Increase

SFHA Decrease

Unchanged

SFHA Increase
0.2% Depth (500-Year)
Areas of Mitigation Interest Purpose and Intended Uses

- Creating public and community awareness of issues affecting flooding and risk
- Providing “food for thought” for communities to sharpen focus and research toward future plan updates and project development
- Identifying interrelationships between upstream/downstream community issues within a watershed
- Using existing areas of focus in mitigation plans to broaden awareness to new audiences
- Showing examples between communities and the public of what has worked in other areas to reduce damages
- Demonstrating that both existing physical hydraulic features (e.g., pinch points) and future development actions (e.g., significant proposed development) can have impacts
- Increasing public awareness of areas where actions can be taken to reduce risks
Quietwater neighborhood has flooded on 4 separate occasions since 1995. The results have produced over 36 claims from 16 structures. Of these structures, 12 are Repetitive Loss and 2 are Severe Repetitive Loss.
Other FEMA Resources

- **Mitigation Programs**
  - Risk Analysis – includes flood hazard maps
  - Risk Reduction – grant programs, building science, floodplain management
  - Best Practices Portfolio

- **Disaster Response and Recovery Resources**
  - Multi-hazard information
Post-Disaster Recovery Maps
Mitigation Planning How-To Guides

- FEMA 386-1 Getting Started
- FEMA 386-2 Understanding Your Risks
- FEMA 386-3 Developing the Mitigation Plan
- FEMA 386-4 Bringing the Plan to Life
- FEMA 386-5 Using Benefit-Cost Review
- FEMA 386-6 Integrating Historic Property and Cultural Resource Considerations into Mitigation Planning
- FEMA 386-7 Integrating Manmade Hazards into Mitigation Planning
- FEMA 386-8 Multi-Jurisdictional Mitigation Planning
- FEMA 386-9 Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects

http://www.fema.gov/plan/mitplanning/index.shtm
Call the Building Science Helpline at (866) 927-2104 or email FEMA-Buildingsciencehelp@dhs.gov.
Desired Outcomes – Shared Vision

- Create resilient and sustainable communities
- Opportunity to explore policy considerations
  - “Make room for the water.”
  - “Grow well where appropriate.”

www.floods.org
Community Recovery and Smart Growth Approaches

- Improve economic development
- Invest in long-term sustainability
- Provide affordable housing choices
- Offer options for green infrastructure
Looking Forward

- Improve interagency coordination
- Foster diverse partnerships
- Refine agency programs to better support community needs
- Include more sustainable approaches to community recovery
- Offer resources at the grass-roots level
- Apply strategies, tools and programs beyond disasters to build community preparedness and improve land use decision-making
Looking Forward

- Identify opportunities
- Create partnerships
- Optimize resources

- Build capacity
- Foster sustainability
- Promote preparedness

[Diagram showing a light bulb with a cloud and a community with the text: 'Once built no opportunity']
Questions???

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Greensburg, Kansas

- Total devastation.
- Opportunity to start fresh.
  - School.
  - Hospital.
  - Community facilities.
  - Infrastructure.
  - Housing.
  - Businesses.
  - New amenities.
Greensburg, Kansas

- **What’s remaining?**
  - People.
  - Jobs.
  - Housing.
  - Quality of life.
  - Final details.

- **Whole or sum of parts?**
Public Process + Committees

- Consensus was reached and people felt ownership
Sustainable Rebuilding

- Neighborhood visioning.
- Economic and redevelopment planning.
- Green infrastructure.
  - Stormwater management.
  - Flood mitigation.
- Affordable housing choices.
- Improve community interconnectivity.
- Streetscape design.
- Mixed use and infill development.
Economic + Redevelopment Planning
Mixed Use and Infill Development
Smart Growth Workshops

► Grass roots
► Simple and accessible
► “Discovered opportunities”
► Ownership and synergy
► New partnerships + resources
► Teaching beyond the disaster
Iowa City, Iowa
Iowa City, Iowa

- **Policy options**
  - Riverfront Corridor District
  - Transportation network / connectivity
Iowa City, Iowa