

STATE AND LOCAL MITIGATION PLANNING  
how-to guide

# Developing the Mitigation Plan

identifying mitigation actions  
and implementation strategies



U.S. Department of Homeland Security



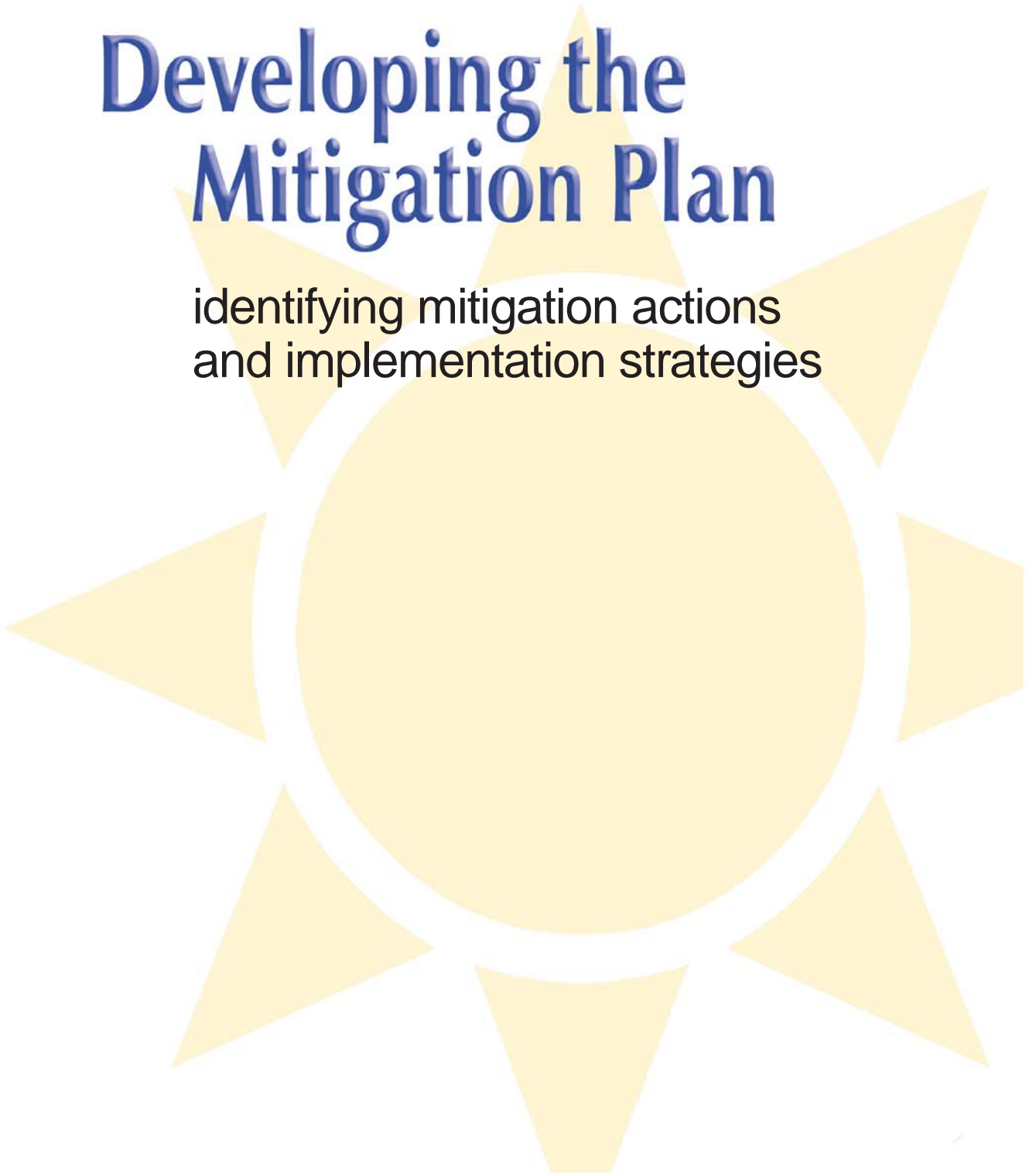
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STATE AND LOCAL MITIGATION PLANNING  
how-to guide

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# the hazard mitigation planning process

Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural and human-caused hazards. As shown in this diagram, the hazard mitigation planning process consists of four basic phases.

For illustration purposes, this diagram portrays a process that appears to proceed sequentially. However, the mitigation planning process is rarely a linear process. It is not unusual that ideas developed while assessing risks should need revision and additional information while developing the mitigation plan, or that implementing the plan may result in new goals or additional risk assessment.

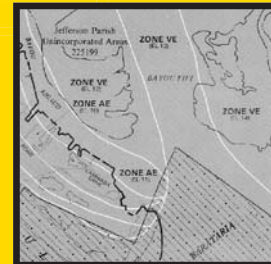
## organize resources

From the start, communities should focus on the resources needed for a successful mitigation planning process. Essential steps include identifying and organizing interested members of the community as well as the technical expertise required during the planning process.



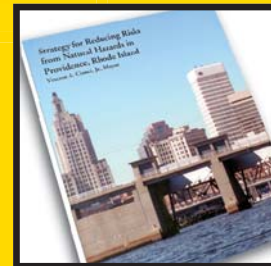
## assess risks

Next, communities need to identify the characteristics and potential consequences of hazards. It is important to understand how much of the community can be affected by specific hazards and what the impacts would be on important community assets.



## develop a mitigation plan

Armed with an understanding of the risks posed by hazards, communities need to determine what their priorities should be and then look at possible ways to avoid or minimize the undesired effects. The result is a hazard mitigation plan and strategy for implementation.



## implement the plan and monitor progress

Communities can bring the plan to life in a variety of ways ranging from implementing specific mitigation projects to changes in the day-to-day operation of the local government. To ensure the success of an on-going program, it is critical that the plan remains relevant. Thus, it is important to conduct periodic evaluations and make revisions as needed.



# foreword

# develop mitigation goals and objectives

## Overview

Now that your hazard profile and loss estimation as described in *Understanding Your Risks* (FEMA 386-2) has been completed, it's time to identify appropriate mitigation actions and develop a strategy to implement them. To guide your decisions, you will develop goals based on your hazard profile and loss estimation findings. You will then formulate objectives to define a path for attaining your goals.



**Goals** are general guidelines that explain what you want to achieve. They are usually broad policy-type statements, long term, and represent global visions, such as:

- The economic vitality of the community will not be threatened by future flood events.
- Minimize wildfire losses in the urban wildfire interface area.
- The continuity of local government operations will not be significantly disrupted by disasters.

**Objectives** define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable, such as:

- Protect structures in the historic downtown area from flood damage.
- Educate citizens about wildfire defensible space actions.
- Prepare plans and identify resources to facilitate reestablishing county operations after a disaster.

**Mitigation Actions** are specific actions that help you achieve your goals and objectives. For example:

- Elevate three historic structures located in the downtown district.
- Sponsor a community fair to promote wildfire defensible space.
- Retrofit the police department to withstand high wind damage.



**You should address all of your hazards**, but focus first

on what you determine to be the most significant and

then address the others when time and resources are available. New tools such as HAZUS-MH are capable of producing multi-hazard risk assessments and aggregating loss estimates when more than one hazard is present.



**Goals, objectives, and actions** are based on a community's values, identity, and culture. There are no "wrong" goals when

it comes to mitigating the effects of hazards. However, community mitigation goals should be consistent with the state's goals and should not contradict other community goals, such as those expressed in the local comprehensive or general plan.

In this step, information revealed in the hazard profiles and loss estimation will be used to develop clear mitigation goals—general guidelines that explain what you want to achieve—and objectives—statements that detail how those goals will be achieved. One way to begin this step is to phrase the findings of the vulnerability assessment as problem statements by reviewing the results of the hazard



and loss estimations and noting trends or patterns in the types and location of previous or potential hazard events, and in the vulnerability of infrastructure, buildings, or populations. You can then structure goals and objectives that steer you toward appropriate mitigation actions.

### The loss estimation you completed

in the second phase of the mitigation planning process should have helped you determine the following:



- Which areas of the community or state are affected by hazards;
- What assets will be affected and how;
- How likely it is that the hazard event may occur; and
- How intense the hazard event may be in terms of its economic and social impacts.

## Procedures & Techniques

### Task A. Review and analyze the results of the hazard profiles and loss estimation.

If you followed the planning process outlined in these guides, you completed a profile and loss estimation for each of the hazards affecting your community or state using the methodology outlined in *Understanding Your Risks* (FEMA 386-2). The hazard profiles include details on the causes of hazards, the likelihood of occurrence, severity, and extent of areas affected. Knowing the severity and frequency of a hazard are factors, among others, that you will consider as you decide which hazards to focus on first.

The loss estimation provides a dollar amount of damages for a particular hazard event in your jurisdiction. It can also provide related economic information, such as business interruption and revenue losses. After reviewing the loss estimation results, the planning team will have a better understanding of the potential impacts or consequences of the hazards. The planning team can now use the loss estimation and community asset data, and hazard profiles to prioritize the hazards and develop problem statements.

#### 1. Review the findings of your risk assessment.

At the end of Phase 2, you compiled the results of your work into a written report. Most of the information needed to complete this task can be drawn from this report. Some technical assistance may be needed to interpret these findings:

- Note the causal factors of each hazard.** For example, flooding in your community may be due to increased flows from excessive rains, snow melts, or backwaters from another river, or your community may experience flash floods in a particular area because of a small creek's capacity or increased paved surfaces due to development. Knowing the causes of the hazard will help determine what type of actions you can take to prevent future damage. Look at the hazard profiles you completed at the end of Step 2 in *Understanding Your Risks* for this information.



b. **Note the hazard characteristics.** How the hazard behaves will greatly influence the range of actions you take and when you implement them. For example, if areas in your community are vulnerable to chronic, low-level, but high-frequency hazard events (e.g., a 10-year flood), you may decide to take immediate actions to protect these assets. Similarly, knowing that the community is vulnerable to a lower probability, but high-damage hazard event (such as an earthquake in the New Madrid fault area) may lead you to take actions that could be accomplished over a longer period of time, but should also be started immediately. An example of this would be initiating the adoption of updated building codes. Look at the hazard profiles you completed at the end of Step 2 in *Understanding Your Risks* for this information.

Keep in mind that even if you followed the steps in *Understanding Your Risks*, you may not have necessarily distinguished between areas subject to chronic, low-damage events and areas subject to low probability, high-consequence events. However, understanding these conditions at this point is important for developing goals, objectives, and mitigation actions.

c. **Note which important and/or critical assets (historic, civic, emergency facilities, transportation, lifelines, etc.) identified in Phase 2 are located in hazard areas.** Look at the asset inventory you completed at the end of Step 3 in *Understanding Your Risks* for this information.

d. **Identify specific characteristics of assets in hazard areas that contribute to their vulnerability** (e.g., older buildings not up to current code located in the floodplain, manufactured housing located in flood- or tornado-prone areas, a hospital whose access can be blocked by landslides that may occur following an earthquake, or houses with wood shingle roofs located next to fire-prone woodlands). Look at the asset inventory you completed at the end of Step 3 in *Understanding Your Risks* for this information.

e. **Review the composite map of vulnerabilities and loss estimate tables to identify the areas and hazards that would produce the most potential losses** (see page 4-2 of *Understanding Your Risks*). Note whether there are special features or characteristics in these hazard areas, such as an economic hub, parkland, or special needs populations, including the elderly or low-income residents.





## Results from the loss estimation

must be presented to citizens, business owners, and elected officials so that they can understand the information. It may be necessary to reformat the data for different types of meetings or presentations, depending on the technical background of the audience. The preformatted data reports and graphic maps contained in HAZUS-MH are useful and effective at communicating risks and making presentations.



You should also revisit the community's collective notions of perceived risks and compare them to the actual risks and potential losses threatening your community. In the beginning of the planning process, team members, elected officials, and the public may have had preconceived notions of which hazards presented the greatest risk, but after preparing your hazard profiles and loss estimation, you now have a more fact-based idea of the hazards that present the greatest threats to your community. This may be an opportunity for a special briefing for community leaders, and for a more concerted effort to inform the public. The hazard profiles and loss estimation results should be reviewed with stakeholders when they come together to develop the goals and objectives for the plan.

## While taking note of the losses

your community faces in this step, begin to think about development policies, regulations, and/or practices that may need to be revised so that future development and construction occur in a safe manner. Furthermore, note whether there are businesses, other organizations, or individuals in the hazard areas that you previously overlooked as potential partners in the planning process.



### *2. Develop a list of problem statements based on these findings.*

Your risk assessment findings may not clearly point you to which hazard to address first. You may be asking: Should we focus on the hazard that could affect the greatest portion of land, such as a wildfire? Maybe our best bet is to focus on the hazard that would result in the greatest amount of damage, such as an earthquake with the potential to level the entire community, or maybe we should focus on the hazard with the greatest chance of occurring, such as a flood. Where should the planning team start in this analysis? One way to carry out this analysis is to develop a list of problem statements. Start by addressing previously listed items *a* through *e* to see your community's vulnerabilities more clearly. Write down each problem that was identified in the report. For example, in Hazardville, the risk assessment identified flooding, wildfires, and earthquakes as hazards affecting the town. THORR can now write such statements as:

- a. The manufactured home park is the most vulnerable area to flooding. This area floods each year. Flooding is caused by excessive rains.
- b. The sewage treatment plant is located in the 100-year floodplain.
- c. The lighthouse, of significant historic value, is threatened by erosion from coastal flooding. The rate of erosion is 5 feet per year.
- d. Wildfires could destroy the primary forest and a number of residential structures. We are experiencing the fourth year of drought conditions.



- e. Hazardville has a moderate earthquake threat. The town lies within a seismic zone that has a 10% chance of exceeding 0.3g in 50 years. An earthquake of that size could damage much of the town and disrupt lifelines, but would cause the most damage to the older buildings located in the downtown business district.

You will probably end up with several problem statements for each hazard. You may also notice that some areas or assets could be affected by multiple hazards. Writing down these issues will help you to better decide which issues to address first.

By the time you complete this exercise, you may have a very long list of problem statements. The challenge you now face is to convert the problem statements into general goal statements to address these issues. One approach you can take is to group problem statements by theme. Look for common or similar characteristics and group those statements together.



You may want to take the opportunity to **prioritize** the issues/problem statements to reflect their relative challenge to the state/community.

### **Task B. Formulate goals.**

Your mitigation goals should articulate the community's desire to protect people and structures, reduce the costs of disaster response and recovery, and minimize disruption to the community, tribe, or state following a disaster. These should not identify specific mitigation actions (those will be developed later), but identify the overall improvements you want to achieve.

Your state will have goals and objectives they wish to focus on, and any funding made available through state or tribal programs may need to address these priorities. Learn what these goals are before developing your own. Your goals should reflect the mitigation mission statement you developed in Phase 1 of the planning process (see *Getting Started*, FEMA 386-1), as well as state or tribal mitigation goals and other local community goals. Contact your State Hazard Mitigation Officer (SHMO) to verify your state's goals.

#### ***1. Develop proposed goal statements.***

Once your problem statements have been grouped by similar themes, you can develop proposed goal statements that correspond to the problem statements. Goals are broad, forward-looking statements that succinctly describe your aims. Several problem statements can lead to one broad goal.



## The Comprehensive Plan



A comprehensive plan (also called a general or master plan) is a document that expresses community goals and objectives. This plan documents the community's desired physical development and includes policy statements that indicate the desired rate and quantity of growth, community character, transportation services, location of growth, and siting of future public facilities and transportation. It also indicates how these goals are to be achieved. These plans are comprehensive in that they cover the entire geographic area of a community and include all of the physical elements that will determine the community's future development. These plans usually contain written policies and land use maps. The comprehensive plan has no authority in and of itself, but it serves as a guide for community decision-making. One of the most common tools used to implement plan policies is the community's zoning ordinance, which creates land use districts and specifies the land uses permitted in each district. All land within the community is classified into one of the zoning districts. Other tools that are used to implement plan policies include subdivision ordinances, site planning and development codes, tax policies, capital improvement policies, and building permit policies. *Not all communities have such plans, however.*

Most communities update their comprehensive plans on a periodic basis, generally every 5 to 10 years. These plans, therefore, should be reviewed for their relevance to current conditions. During review of the community's comprehensive plan, consider ways to incorporate hazard mitigation components into the plan at its next scheduled update. Many communities already have comprehensive plans, and incorporating hazard mitigation into the next plan update is a good way to keep the community focused on making day-to-day decisions that support hazard loss reduction.

For example, if your problem statements addressing floods are:

- The manufactured home park is the most vulnerable area to flooding. This area floods each year. Flooding is caused by excessive rains.
- The sewage treatment plant is located in the 100-year floodplain.

Your proposed goal statement may be:

- Minimize losses to existing and future structures within hazard areas, or
- Minimize losses to existing and future structures, especially critical facilities, from flooding.

The first goal is very general. It can apply to any structure, including critical facilities, and also addresses other hazards. The second goal focuses only on floods and points out critical facilities as a priority. There is no right or wrong way of writing your goals. Some mitigation plans have very general goal statements (see the following two excerpts), while others may be more specific. The key is to write goals that are achievable through the corresponding objectives.

### ***2. Review existing plans and other policy documents to identify potential conflicts.***

Hazard mitigation goals, while broad, should be consistent with the goals and objectives of other plans in your community. Comprehensive plans, for example, may address issues such as sustainable development, smart growth, watershed protection, and transportation policies. Review existing plans and list the goals established in these plans to assess whether they conflict with those for reducing the effects of hazards. In the event that goals do conflict, it is important to discuss how such a conflict would be resolved. It may be that the existing plan did not benefit from the hazard knowledge you now have. When the goals complement each other, an opportunity to build support for mitigation is created, and there is the potential to implement planning initiatives that serve multiple objectives for your community.

Look for plans or policies that address topics that are closely related to mitigating the effects of hazards, including:

- Sustainability
- Economic growth
- Growth management



- Environmental preservation
- Historic preservation
- Redevelopment
- Health and/or safety
- Recreation
- Land use/zoning
- Public education and outreach
- Transportation

When reviewing the plans, note sections and related ordinances that could be revised or updated to provide a more comprehensive approach to hazard mitigation. These changes may end up as recommended actions in Step 2. For example, sections addressing redevelopment may be revised to include provisions to incorporate a hazard mitigation assessment of new redevelopment proposals. Review goals presented in other community mitigation plans within your state, or those of other communities with similar hazards, to determine whether you have overlooked any key issues. Contact your SHMO for assistance.

### **Task C. Determine objectives.**

After you have developed your mitigation goals, you are ready to formulate objectives. Objectives are more specific and narrower in scope than goals. They expand on the goals and provide more detail on the ways to accomplish them. While the planning team undoubtedly will have many good ideas, the public should also be involved in developing these objectives. Several ways to include the public in this process are discussed in Task D. It is important to have measurable objectives because they provide a roadmap for successfully implementing the strategy.

Some goals and objectives may not be based solely on the results of the loss estimation, but also on social and environmental values, political desires, historic preservation concerns, and/or state mitigation priorities and funding opportunities. For example, a community with a large tourism industry may be more interested in protecting historic or commercial assets first than in protecting other assets that demonstrate a higher vulnerability to hazards. If this is the case, the planning team should document the reasoning behind these goals or objectives.



**Objectives** define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable.





### Example of state goals and objectives:

North Carolina State Mitigation Goals (excerpted from the August 2001 state plan).

**Goal 1 Maintain and enhance the North Carolina Division of Emergency Management’s capacity to continuously make North Carolina less vulnerable to hazards.**

- Objective 1.1 Institutionalize hazard mitigation.
- Objective 1.2 Improve organizational efficiency.
- Objective 1.3 Maximize utilization of best technology.

**Goal 2 Build and support local capacity and commitment to become continuously less vulnerable to hazards.**

- Objective 2.1 Increase awareness and knowledge of hazard mitigation principles and practice among local public officials.
- Objective 2.2 Provide direct technical assistance to local public officials and help communities obtain funding for mitigation planning and project activities.
- Objective 2.3 Encourage communities to develop, adopt, and implement local hazard mitigation plans.

**Goal 3 Improve coordination and communication with other relevant organizations.**

- Objective 3.1 Establish and maintain lasting partnerships.
- Objective 3.2 Streamline policies to eliminate conflicts and duplication of effort.
- Objective 3.3 Incorporate hazard mitigation into activities of other organizations.

**Goal 4 Increase public understanding, support, and demand for hazard mitigation.**

- Objective 4.1 Identify hazard-specific issues and needs.
- Objective 4.2 Heighten public awareness of natural hazards.
- Objective 4.3 Publicize and encourage the adoption of appropriate hazard mitigation actions.

### Task D. Get public input.

Involving the public when developing the community’s goals and objectives is important to ensure fair representation of all sectors in the community or tribe and reduces the chance that any concerns will be overlooked. The more that the public or those who will be affected by your plan participate in the process, the more likely it is that they will support the process and the plan. The method you choose to use to involve the public depends on the size of your jurisdiction, the style of public input that normally is used for community issues, the established timeline, and the resources available. You most likely developed a set of procedures earlier in the planning process when you established the planning team and secured support for the process. The following summarizes some of the in-







### Example of community goals and objectives:

Village of Gurnee, Illinois, Mitigation Goals (excerpted from the November 15, 2001 plan)

#### Goal 1 Protect existing properties.

Objectives:

- Use the most effective approaches to protect buildings from flooding, including acquisition or relocation where warranted.
- Enact and enforce regulatory measures that ensure new development will not increase flood threats to existing properties.
- Use appropriate actions to mitigate against the danger and damage posted by other hazards.

#### Goal 2 Protect health and safety.

Objectives:

- Advise everyone of safety and health precautions to take against flooding and other hazards.
- Improve traffic circulation during floods and at other times.
- Improve water quality and habitat.

#### Goal 3 Improve the quality of life in Gurnee.

Objectives:

- Preserve and improve the downtown core of businesses and services.
- Ensure that current owners can maintain and improve their properties.
- Use acquisition programs to expand open space and recreational opportunities.
- Maintain an attractive riverfront and other public open spaces.

#### Goal 4 Ensure that public funds are used in the most efficient manner.

Objectives:

- Prioritize mitigation projects, starting with sites facing the greatest threat to life, health, and property.
- Use public funding to protect public services and critical facilities.
- Use public funding for projects on private property where the benefits exceed the costs.
- Maximize the use of outside sources of funding.
- Maximize owner participation in mitigation efforts to protect their own properties.
- Encourage property-owner self-protection measures.

formation contained in *Getting Started: Building Support for Mitigation Planning* (FEMA 386-1).

#### ***1. Organize public forums to solicit input on community goals and objectives.***

You may choose to conduct more than one of the approaches proposed below, or you may use another method that has already been successful in your community, tribe, or state. All of the approaches provide citizens with an opportunity to voice their concerns, present ideas about the mitigation plan, and learn about how proposed actions may affect them.



## Involving the public and other stakeholders

in the development of goals and objectives is crucial to developing an effective plan. Inviting stakeholders to join a working group or advisory committee is a good way to involve them. People may be hesitant to serve on one of these committees because they may not realize how important it is or not know what to expect. Recruiting people may be easier if, from the beginning of the planning process, the planning team has organized public involvement and education activities. (See Step 3 in *Getting Started*, FEMA 386-1 for additional information.)



- a. **Town Hall meetings.** Town Hall meetings are an effective way to bring citizens and other stakeholders together to learn about study findings and the progress being made on the plan, and to provide input on the proposed goals and mitigation strategy.
- b. **Working groups or advisory committees.** Working groups or advisory committees may have already been established by topic areas, such as land use, environmental protection, and transportation. These committees can help the planning team identify goals and objectives specific to their topic areas. Membership in such committees should be broad-based. They should include people with direct knowledge or understanding of the topic, as well as those directly affected by the problems and/or those with a specific interest in it.
- c. **Facilitated meetings.** A large workshop or group session may be more appropriate when many stakeholders are expected to attend. These meetings are most productive when a trained facilitator is used. With the facilitator's assistance, the planning team can get opinions, suggestions, and other information that may be useful to consider when setting goals and objectives.

Other participation methods include hosting a public workshop, establishing a hotline, conducting interviews, and distributing a survey or questionnaire (these methods are covered in *Getting Started*, FEMA 386-1). Workshops can be held at different milestones in the planning process for large or small groups of community, tribal, or state representatives, business representatives, and citizens. These meetings can bring problems and issues to the table and provide new ideas for solutions.

### ***2. Develop consensus on goals and objectives.***

An important task to accomplish during your public involvement activities is to build consensus on the proposed goals and objectives. Make sure that you allow time in the agenda for the participants to formally express their opinions on the proposed goals and objectives. See *Getting Started* (FEMA 386-1) for consensus building methods to use in your meetings. It is important for your elected leaders, civic organizations, and agencies to agree on the proposed goals and objectives, as they will guide your mitigation strategy.





## Sample Performance-Based Objectives

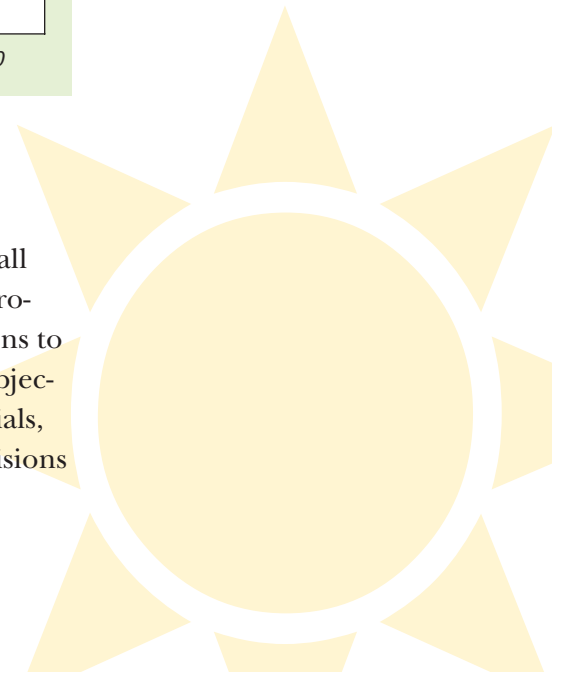
You may wish to include time frames and specific targets within those time frames as part of your objectives (see examples). There is no single method for developing good objectives. What is important is that the objectives you develop achieve the goals and allow you to measure progress toward reducing your risks.

Element	Sample Performance-Based Objectives
<b>Housing</b>	Within 2 years, reduce by 10% the number of houses in the floodplain that are subject to repetitive losses from flooding.
	Within 10 years, reduce by 30% the number of houses that are in the floodplain and vulnerable to flooding.
<b>Business</b>	Within 2 years, increase by 20% the number of businesses that have developed a business risk reduction plan.
	Within 3 years, increase from 15% to 60% the proportion of businesses that have flood insurance.
<b>Critical Facilities</b>	Within 5 years, increase by 25% the number of wastewater treatment plants that have carried out mitigation measures to ensure their functionality in a 100-year flood.
	Within 5 years, increase by 20% the number of electric utilities in seismically vulnerable areas that have undertaken seismic retrofit measures to ensure their functionality following a damaging earthquake of magnitude 6.0 or greater.
<b>Environment</b>	Within 3 years, reduce by 20% the number of agricultural businesses that have production, storage, or processing facilities that are vulnerable to flooding.

*Source: Hazard Mitigation in North Carolina: Measuring Success, February 2000*

## Summary

Developing clear goals and objectives that reinforce your overall purpose and mission for undertaking a mitigation planning process keeps the planning team focused and helps clarify solutions to problems and issues as they arise. Well articulated goals and objectives that are agreed upon by the planning team, elected officials, and the public provide the necessary framework by which decisions on mitigation actions will be based.



# The Hazardville Post

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## THORR Develops Hazard Mitigation Goals and Objectives

(Part 1 of a 4-Part Series on the Mitigation Strategy Process)

[Hazardville, EM] In a facilitated workshop last night, the Town of Hazardville Organization for Risk Reduction (THORR) developed several hazard mitigation goals to guide the town in its mission of disaster resistance. THORR has been working for the past several months to develop a hazard mitigation plan, using the process outlined in the Federal Emergency Management Agency's (FEMA) how-to guides.

To identify goals and objectives, THORR first overlaid a base map of the town with a hazard map created during the loss estimation

study completed in November 2001. Highlighting the areas in the town likely to suffer losses during hazard events, THORR and the advisory committee clarified the town's concerns with a list of problem statements, including the following:

- The manufactured home park is the most vulnerable area to flooding. This area floods each year. Flooding is caused by excessive rains.
- The sewage treatment plant is located in the 100-year floodplain.
- The lighthouse, of significant historic value, is threatened by erosion from coastal flooding. The rate of erosion is 5 feet per year.
- Wildfires could destroy the primary forest and a number of residential structures. We are experiencing the fourth year of drought conditions.
- Hazardville has a moderate earthquake threat. The town lies within a seismic zone that has a 10% chance of exceeding 0.3g in 50 years. An earthquake of that size could damage much of the town and disrupt lifelines, but would cause the most damage to older buildings in the downtown business district.

From these statements, THORR developed goals and objectives to address these problems. Joe Norris, Hazardville's Planning Department Director and task force leader, said that by defining the goals and objectives, "We are taking a long-range view to make our community more disaster resistant. We are developing these goals and objectives on a town-wide basis but are also considering statewide priorities."

Much of the credit for developing goals and objectives goes to the advisory committee. Advisory committee members had some very lengthy discussions about the difference between goals and objectives. Some members wanted to write very specific goals that sounded more like actions. Joe Norris was helpful in pointing out the difference and using existing goals and objectives of other Hazardville plans as examples to help guide the group.

"Sheila Frost, a local business leader and member of the advisory committee, worked really hard to bring town and county leaders together in a workshop to discuss sustainable development," Norris said. "At first, some THORR members didn't get the connection, but even-

*(continued on page 1-13)*

Town of Hazardville Composite Loss Map



*(continued from page 1-12)*

tually everyone realized that sustainable development could truly help our mission of disaster-resistance.”

As stated by Mayor McDonald, “The primary purpose of hazard mitigation is to minimize or eliminate the vulnerability of people, property, and resources to all types of hazards. A key benefit is that money spent on hazard mitigation today will significantly reduce human suffering and future demand for large amounts of dollars when disasters strike. As part of this, we must closely examine all current town operations and policies.”

Vincent D’Blizzard, a member of the advisory committee and president of the chamber of commerce, said that a hazard mitigation plan would reduce the economic losses that often follow a hazard event, including destruction of property, loss or interruption of jobs, and closing or disabling of businesses and critical facilities. D’Blizzard reminded business leaders that the manufactured home park where many of the workers live is prone to flooding and unreinforced commercial masonry buildings located in the older part of town are prone to earthquake damage. Mayor McDonald agreed, and added, “Mitigation is a philosophy that includes a range of actions that, when holistically implemented, increases a community’s resiliency to disasters.”

Some of the goals, and their associated objectives, identified in the workshop included:

**Goal #1:** Minimize losses to existing and future structures within hazard areas.

**Objectives:**

- Reduce damages to the manufactured home park in the floodplain.
- Address potential flooding problems to the sewage treatment plant.
- Strengthen existing buildings to withstand the impact of earthquakes.

**Goal #2:** Preserve invaluable cultural resources threatened by hazards.

**Objective:**

- Protect the lighthouse from erosion and coastal flooding.

**Goal #3:** Promote sustainable development to improve the quality of life.

**Objectives:**

- Establish open space parks and recreational areas in hazard areas.
- Provide for the conservation and protection of natural resources.
- Prohibit additional housing (especially elderly and high density) in areas of high hazard risk.

**Goal #4:** Increase public awareness of hazards to facilitate support for and adoption of mitigation actions.

**Objectives:**

- Develop education programs to reach all citizens, especially those within high hazard areas.
- Encourage businesses and private property owners to adopt appropriate mitigation actions.

**Goal #5:** Prevent destruction of forests and structures in the Urban Wildland Interface.

**Objectives:**

- Improve communications capability between local and county emergency management and law enforcement personnel.
- Protect structures in the Urban Wildland Interface.
- Develop evacuation procedures to enable residents near the forest to evacuate safely.





1 develop mitigation goals and objectives



step

2

identify and prioritize mitigation actions



3 prepare an implementation strategy



4 document the mitigation planning process



# identify and prioritize mitigation actions

## Overview

In Step 2, you will identify, evaluate, and prioritize mitigation actions that address the goals and objectives developed by the planning team in Step 1. These actions form the core of your mitigation plan, and will be the most outward representation of the planning process to the general public and political leadership in your community. As such, it may be tempting at this point in the planning process to quickly finalize a list of projects that would simply get the job done. However, it is important to take time to evaluate the relative merits of the alternative mitigation actions and the local conditions in which these activities would be pursued. In doing so, you can be confident that the actions you end up with will have public, government, and political support, and will be the appropriate technical response to the hazard issues in your community.

Some actions you identify may be “bricks and mortar” projects, such as constructing tornado shelters or safe rooms, and retrofit-



### Mitigation actions can be grouped into six broad categories:

- 1. Prevention.** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
- 2. Property Protection.** Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- 3. Public Education and Awareness.** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- 4. Natural Resource Protection.** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- 5. Emergency Services.** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- 6. Structural Projects.** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.



ting or rehabilitating existing structures to resist flood, wind, or seismic forces. Others may be non-construction related projects, such as acquisition and relocation of threatened structures and implementation of educational awareness programs. Regulatory actions are also non-construction alternatives that often take the form of new legislation or amendments to existing laws, building codes, or land development ordinances.

The evaluation and prioritization of the alternative mitigation actions will produce a list of recommended mitigation actions to incorporate into the mitigation plan. The process outlined in this step includes a comparative evaluation of the pluses and minuses for each potential action. During this effort, the planning team will address a number of important questions, including:

- Which actions can help us meet our mitigation objectives?
- What capabilities do we have to implement these actions?
- What impacts (if any) will these actions have on our community?

**Document the process** you used and the sources you sought to help identify possible mitigation actions. You will need this information in Step 4 to write your mitigation plan in accordance with relevant FEMA program requirements.



## Procedures & Techniques

### Task A. Identify alternative mitigation actions.

The purpose of this task is to identify a variety of possible actions to address the mitigation objectives you developed in Step 1. You will use **Worksheet #1: Identify Alternative Mitigation Actions** to record these actions for use in subsequent tasks. Start by filling in your community's goal and corresponding objective. Then consult a variety of sources, some of which follow, to identify potential alternative mitigation actions appropriate for your area. List these alternative actions and the sources used on your worksheet.

#### *1. Review existing literature and resources.*

Using your list of mitigation objectives as the foundation, identify alternative actions that may achieve these objectives. Existing literature can help identify alternative mitigation actions and shed light on specific issues to consider when you evaluate the alternatives later. A number of publications, Web sites, and other resources provide information on the structural integrity, specific design features, and approximate cost ranges of actions.

While there is no single source of information for all possible mitigation actions, the library in Appendix B provides many resources as a starting point for the planning team. Additionally, **Worksheet**



**Examples of alternative mitigation actions include:**

- Adopting land use planning policies based on known hazards
- Developing an outreach program to encourage homeowners to buy hazard insurance to protect belongings
- Relocating structures away from hazard-prone areas
- Developing an outreach program to encourage homeowners to secure furnishings, storage cabinets, and utilities to prevent injuries and damages during an earthquake
- Retrofitting structures to strengthen resistance to damage
- Developing, adopting, and enforcing effective building codes and standards
- Engineering or retrofitting roads and bridges to withstand hazards
- Requiring the use of fire-retardant materials in new construction
- Requiring disclosure of hazards as part of real estate transactions
- Adopting ordinances to reduce risks to existing hazard-prone buildings
- Imposing freeboard requirements in special flood hazard areas
- Implementing V Zone construction requirements for new development located in coastal A Zones

**Job Aid #1: Alternative Mitigation Actions by Hazard** (Appendix D) may help you identify potential mitigation actions. The matrix lists alternative mitigation actions that may be applicable across a range of seven major natural hazards. This job aid is organized according to the six broad categories of mitigation actions presented earlier. This listing is not exhaustive; therefore, the planning team should also ask the “expert” partners identified in Phase 1 (see *Getting Started*, FEMA 386-1) to suggest other possible mitigation actions.

Scientists and hazard experts (e.g., geologists, seismologists, hydrologists, etc.), as well as floodplain managers, emergency managers, fire marshals, public works engineers, transportation engineers, and civil engineers who are expert in applying mitigation and emergency management principles all have valuable experience in knowing what works to mitigate hazards. These experts can help you evaluate whether the mitigation alternative will fulfill your objective, if the action provides a long-term solution to the problem, and possibly what some of the social, administrative, environmental, and economic implications are for your planning area. Furthermore, some potential alternative actions involve complex engineering and may require additional study before a solution or alternative mitigation action can be identified. For example, if your objective is to reduce flood damage in a particular location, but you are not sure if the flooding is caused by undersized culverts, inadequate storm drainage, or debris, you will have to ask an engi-



**When identifying alternative mitigation actions**, be sure to evaluate needs for both existing and future buildings and infrastructure.



**States have prepared technical guides** to assist local communities. The following two guides available

through the Web include descriptions of various mitigation actions to address hazards:

- North Carolina Division of Emergency Management, *Tools and Techniques for Mitigating the Effects of Natural Hazards* at [http://www.dem.dcc.state.nc.us/mitigation/Library/Full\\_Tools\\_and\\_Tech.pdf](http://www.dem.dcc.state.nc.us/mitigation/Library/Full_Tools_and_Tech.pdf)
- Oregon Department of Land Conservation and Development (DLCD), *Planning for Natural Hazards—Oregon Technical Resource Guide* at <http://www.lcd.state.or.us/hazhtml/Guidehome.htm>



*Fill in the goal and its corresponding objective developed in Step 1. Use a separate worksheet for each objective. Make sure you note the sources of information. Use Worksheet Job Aid #1 in Appendix D as a starting point for identifying potential mitigation actions. The examples in this worksheet and the remaining worksheets refer to Hazardville and are for illustrative purposes. Blank worksheets can be found in Appendix C.*

**Goal:** Minimize losses to existing and future structures within hazard areas.

**Objective:** Reduce potential damages to the manufactured home park in the floodplain.

Alternative Actions	Sources of Information (Include sources you consulted for future reference and documentation.)	Comments (Note any initial issues you may want to discuss or research further.)
1. Acquire flood-prone structures	State Hazard Mitigation Officer	Effective for existing development. Some floodplain residents are just unwilling to sell. A number of elderly renters may be disproportionately affected because there are few affordable rental units in the community.
2. Construct a berm around the park	Hazardville Dept. of Public Works	This option would only work in areas where flooding is less than 2 feet deep, according to our risk assessment. Many of the sites at risk will get more than 4 feet of flooding during a 100-year flood.
3. Elevate structures	Hazardville Dept. of Public Works	Suitable for structures in good condition. Cost of elevation may outweigh expected losses to the home. Elevated structures can be more vulnerable to earthquakes unless additional bracing is used.

Have you considered alternative mitigation actions from other mitigation action categories?  
Check off ones that apply to this objective.

- |   |   |  |
|---|---|--|
| <input checked="" type="checkbox"/> Prevention          | <input type="checkbox"/> Public Education and Awareness | <input type="checkbox"/> Emergency Services  |
| <input checked="" type="checkbox"/> Property Protection | <input type="checkbox"/> Natural Resource Protection    | <input type="checkbox"/> Structural Projects |





neer to evaluate the flooding condition, or recommend that an engineering analysis be conducted to identify potential solutions.

**2. Review “success stories.”**

Other communities or states may have already addressed your same problem and developed a solution that may also work for your community. Ask your State Hazard Mitigation Officer (SHMO) to help identify success stories from other communities or states. In addition, FEMA has “success stories” and “best practices” guides that can help identify what other communities have done.

**3. Solicit public opinion and input.**

Surveys or questionnaires are very effective tools for gathering information on potential alternative mitigation actions that would be acceptable or preferred by community residents. With surveys, not only can you collect valuable information, but you can also establish rapport and foster involvement among citizens. Best of all, you reach people who don’t show up for meetings. A survey or questionnaire can be included in a utility bill mailing, conducted door-to-door, or posted on a community Web site.

The survey should ask for information such as:

- The residents’ understanding of what is currently being done to address hazards;
- What residents think is lacking in current efforts and what could be improved upon;
- Suggestions and preferences of proposed mitigation actions (see survey excerpt); and
- Which of your mitigation goals and objectives do residents feel are most important to pursue.

Surveys, however, can be costly for a community, tribe, or state to undertake. Volunteers can help to reduce costs. For some communities, however, a survey may be too expensive and alternative ways to obtain information must be pursued.



**FEMA’s Mitigation Resources for Success CD (FEMA 372)**

features a variety of technical, case study, and federal program information that will help build support and provide resources for undertaking hazard mitigation activities and programs. The CD includes useful information, publications, technical fact sheets, photographs, case studies, and federal and state mitigation program information and contacts. The documents and photographs can be exported to other documents, Web sites, and publications, and can be used in educational and training presentations. To obtain a copy, call the FEMA publications warehouse at 1-800-480-2520. FEMA’s Web site also includes a Web page with information on success stories: <http://www.fema.gov/fima/success.shtm>.



**Acknowledge current policies and practices**

that have been successful in your community, tribe, or state. Publicizing these successes fosters support for continuing or increasing mitigation efforts.



**University and college students**

are a useful and low-cost resource for developing surveys. Sociology, environmental sciences, or urban planning departments are good places to start. Workshops or public gatherings are another good way to involve the public in identifying a range of alternative mitigation actions. Survey questions can be handed out and collected from the group as part of the meeting to ensure that the planning team has provided an opportunity for public input to the plan. The survey excerpt shown here was developed and implemented with assistance from students in the University of Oregon Department of Community and Regional Planning.





**Excerpt from the Oregon Household Natural Hazards Preparedness Questionnaire, January 2003.** The complete survey can be found in Appendix E.

18. A number of activities can reduce your community's risk from natural hazards. These activities can be both regulatory and non-regulatory. An example of a regulatory activity would be a policy that limits or prohibits development in a known hazard area such as a floodplain. An example of a non-regulatory activity would be to develop a public education program to demonstrate steps citizens can take to make their homes safer from natural hazards. Please check the box that best represents your opinion of the following strategies to reduce the risk and loss associated with natural disasters.

Community-Wide Strategies		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Not Sure
A.	I support a regulatory approach to reducing risk.						
B.	I support a non-regulatory approach to reducing risk.						
C.	I support a mix of both regulatory and non-regulatory approaches to reducing risk.						
D.	I support policies to prohibit development in areas subject to natural hazards.						
E.	I support the use of tax dollars (federal and/or local) to compensate land owners for not developing in areas subject to natural hazards.						

### Capability Assessment

A capability assessment has two components: an inventory of an agency's mission, programs, and policies; and an analysis of its capacity to carry them out. A capability assessment is an integral part of the planning process in which you identify, review, and analyze what your state and community are currently doing to reduce losses and identify the framework that is in place or should be in place for the implementation of new mitigation actions. Depending on how your community or state is developing the mitigation plan, capability assessments can be conducted effectively at different points in the planning process. The capability assessment has been included here in this guide because the inventory will generate information that will help the community and state evaluate alternative mitigation actions. Similarly, analyzing what your community and state has the capacity to do, and understanding what needs to be changed or enhanced to facilitate loss reduction, enables you to address such shortfalls in your mitigation plan.



#### 4. Summarize your findings.

The planning team will use the results of Task A to evaluate the alternative mitigation actions in Task C. The planning team can use Worksheet #1 as the summary or, if a team member has time, he or she can summarize the research and present it in a more detailed manner. Any background information the planning team discovers along the way regarding the implications of various alternatives (e.g., relative costs, potential environmental impacts, regulatory requirements, etc.) should be available to the whole planning team for consideration in the next task.

#### Task B. Identify and analyze state and local mitigation capabilities.

In this task, you will review and analyze state and local programs, policies, regulations, funding, and practices currently in place that either facilitate or hinder mitigation in general, including how the construction of buildings and infrastructure in hazard-prone areas is regulated. You will also learn how your local, tribal, and state governments are structured in terms of professional staff that would be available to directly carry out mitigation actions, or to provide technical assistance. This inventory and analysis is often called a capability assessment. By completing this assessment, you will learn how

or whether your community will be able to implement certain mitigation activities by determining:

- Types of mitigation actions that may be prohibited by law;
- Limitations that may exist on undertaking actions; and
- The range of local and/or state administrative, programmatic, regulatory, financial, and technical resources available to assist in implementing your mitigation strategy.

This information will feed directly into the analysis of the specific mitigation actions you will undertake in Task C.

**1. Review the state capability assessment.**

The state capability assessment provides local jurisdictions with valuable information to determine the viability of certain mitigation actions. Review the information provided in the state capability assessment with regard to the following:

- Will the state be able to provide sufficient resources to assist you (financially, technically, administratively, or with respect to regulations) in implementing specific alternative mitigation actions (e.g., is technical staff or funding available to assist in evaluating your critical facilities for natural hazard vulnerability)?
- Will certain mitigation actions not be available to you (e.g., does the state prohibit the use of public funds to purchase private property)?
- Are there state regulations, initiatives, or policies that operate at the local level that have negative implications for improving loss reduction efforts? (For example, does the state require that all incorporated jurisdictions use a specific building code? This would be considered somewhat supportive because everyone in the building industry would use the same code throughout the state; however, it may hinder a coastal community’s ability, for example, to enact stricter requirements regarding wind loads.)

If the state capability assessment has not been completed, you may wish to work with your State Hazard Mitigation Officer to obtain the information to complete **Worksheet #2: State Mitigation Capability Assessment**. You will need this information to determine local capabilities.



**Inventory and analyze your capabilities** for implementing mitigation actions at the state and local levels.

DMA 2000 requires states, as part of their mitigation strategy, to discuss their “pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: an evaluation of state laws, regulations, policies and programs related to hazard mitigation as well as to development in hazard-prone areas; a discussion of state funding capabilities for hazard mitigation projects; and a general description and analysis of local mitigation policies, programs and capabilities” [44 CFR §201.4 (c)(3)(ii)]. The capability assessment provides an opportunity for the state to identify the resources and tools (programs, laws, policies, practices, and staffing) that pertain to loss reduction, and to evaluate these tools based on whether they support, facilitate, or hinder loss reduction at the state and local levels.

The state’s mitigation capabilities will have significant implications for the local planning effort. For example, the state may require that all local floodplain management ordinances contain the provision that new construction must be elevated to one foot above the base flood elevation. This is an example of a policy that supports mitigation. The state may have established a fund to assist local governments in acquiring property for various public benefits (including loss reduction). This is an effort that can facilitate local mitigation efforts. Alternatively, in an effort to stimulate tourism, the state may have an economic development program that provides incentives to businesses that locate along coastal waterfronts. This is an example of a program that may hinder mitigation efforts.

The state capability assessment serves as the backdrop or prelude to the identification of specific mitigation efforts targeted for state-level planning, as well as for local planning. Similarly, by evaluating the effectiveness of their existing activities with respect to capabilities of local jurisdictions, states can determine the need for any additional programs to assist communities in their mitigation efforts, and include those additional action items in the state mitigation plan.

States should coordinate the results of their capability assessment with tribal and local governments within their jurisdictional area.

Worksheet #2: State Mitigation Capability Assessment provides a suggested template for states to complete a capability assessment.

*List the name of the agency and its mission and function in the first column. By identifying the missions and functions, as well as programs, plans, policies, regulations, funding, and other practices administered by agencies, states create an inventory of resources that can be brought to bear on mitigation efforts within the state.*

*List any programs, plans, policies, etc., this agency has in the second column. It is important to include within this column any legal authorities (which will be found within state regulations) that govern how land would be developed within hazard areas. Typically, these types of regulations are found in state codes under emergency management or public safety codes, building and construction codes, or planning codes. You should also take the opportunity to include any resources that this organization has developed for either state or local use as part of each respective program. Include any appropriate legal citations or source references for programs, regulations, policies, etc.*

*If you know a point of contact, list it in the third column.*

*Check off what type of effect the programs, plans, policies, etc., have on loss reduction. States should now evaluate the effects or implications of these activities on efforts to reduce losses within the state (fourth column). This evaluation should address the implications for both the state and local levels. The essential questions to be answered are: Does/would this program/plan/policy etc., support or facilitate mitigation efforts, or does/would it hinder these efforts? How or why? Put these reasons in the Comments column. At this point, you will not yet try to resolve any issues (such as if a particular program or policy could negatively affect proposed mitigation efforts). However, the planning team will carry forward this information as input into the evaluation of specific actions in Task C.*

*Finally, add any other comments you may have about the agency or its activities in the last column.*

Agency Name (Mission/Function)	Programs, Plans, Policies, Regulations, Funding, or Practices	Point of Contact Name, Address, Phone, Email	Effect on Loss Reduction* (✓)			Comments
			Support	Facilitate	Hinder	
<b>Department of Economic Development</b>  (To enhance the economic well-being of the citizens of the State of Emergency through public investment.)	1. <b>Infrastructure Development Fund</b>	<b>Goldie Graham</b> 586 Ventura Blvd. Capitalia, EM (555) 555-2345		✓		Provides grants and loans to fund local infrastructure improvements, including stormwater management projects, for new or expanding businesses.
	2. <b>Development Tax Credits for Priority Growth Communities</b>	<b>Buck Doughman</b> 200 Greenback Dr. Capitalia, EM (555) 555-2346			✓	Provides tax credits to private investors who develop land in Priority Growth Communities. Because Hazardville is one of the state's Priority Growth Communities, the state could be subsidizing developers to build in the floodplain.

**\*Definitions:**

**Support:** Programs, plans, policies, regulations, funding, or practices that help the implementation of mitigation actions.

**Facilitate:** Programs, plans, policies, etc., that make implementing mitigation actions easier.

**Hinder:** Programs, plans, policies, etc., that pose obstacles to implementation of mitigation actions.





After you have obtained state level information on programs, plans, policies, regulations, funding, and practices, review the results to gain a greater understanding of how these state resources will affect mitigation in your specific community. Since you have already done some research into potential mitigation actions (Task A), and you know your goals and objectives (Step 1), you can address in at least a minimal way whether these policies, regulations, etc., will have an impact on the type of mitigation actions you are beginning to explore.

**2. Complete a local capability assessment.**

The planning team can use **Worksheet #3: Local Mitigation Capability Assessment** and **Worksheet Job Aid #2: Local Hazard Mitigation Capabilities** to complete this subtask. The planning team can use Job Aid #2 to identify specific regulatory tools, staff, and financial resources that exist in your jurisdiction. The team can then transfer this information to Worksheet #3.

Your proposed mitigation actions will be evaluated against the backdrop of what is feasible in terms of your government’s legal, administrative, fiscal, and technical capacities. Additionally, there are many types of mitigation activities, some of which will require funding, construction-related actions, and procedural and policy changes. As such, local jurisdictions should examine these capabilities in light of the type of activities they are interested in pursuing.

As shown in Worksheet #2, your state’s capability assessment should include a description of a range of agencies and their resources, responsibilities, and limitations related to implementing mitigation initiatives. It is now time to create your own local capability assessment using Worksheet #3. Make a list of state agencies, regional organizations, and local government agencies mentioned in the state assessment. The state capability assessment will not focus on your specific jurisdiction; therefore, you should expand your list to include local agencies with policies, programs, and skills in multiple departments that can have an effect on mitigation activities. You may have identified some of these agencies when you prepared the hazard profile and loss estimate in Phase 2. At a minimum, you should list local government agencies, departments, and offices with responsibility for planning, building code enforcement, mapping, building, and/or managing physical assets, as well as for emergency management functions (see tip box above).

It may be helpful to list these organizations, as well as other departments or agencies that do not appear to have a direct impact on



**The following agencies** or departments can contribute to an understanding of the local tools and resources available for loss reduction:

- Building, Zoning, and Code Enforcement
- Councils of Government
- Economic Development
- Emergency Management
- Environmental
- Housing
- Planning
- Police and Fire
- Public Works
- Parks and Recreation
- Regional Planning Organizations
- Transportation



**If the planning team feels that there are significant political problems** in the community, a consultant may be the

best way to ensure an objective evaluation of the effects of programs, plans, policies, regulations, funding, and practices on loss reduction. An outside consultant should have the ability to look at a situation without attachment, emotion, or bias. You may decide to ask the consultant to perform the entire capability assessment, as some of the results of this assessment may be perceived as an attack on the responsible agency in your state or community.



## While a formal discussion on community capabilities is not required

# DMA

by the DMA 2000 requirements for *local* plans, *state* plans must provide some detail about local capabilities. To assist the state in meeting this requirement and to develop a more comprehensive understanding of mitigation's role in your community, performing a local capability assessment is *highly recommended*. Rules implementing DMA 2000 state that the local mitigation strategy must be "based on existing authorities, policies, programs, and resources, and [the community's] ability to expand on and improve these existing tools" [44CFR§201.6 (c)(3)].

## The Institute for Local Self Government



(Institute) is a non-profit organization that provides research, information, and support for the development of public policy for California communities and cities. One of its more notable programs, the Community Land Use Project, assists public agencies with decision-making and the defense of their practices in environmental preservation land use decisions. The Institute has a wealth of information on its Web site, including an easy to understand section on takings, government finance, and fiscal analyses, and tips for public participation and effective citizen involvement. Although targeted to a California audience, there is still a lot of useful information on the Web site that can be used by anyone. More information about the Institute can be found at <http://www.ilsg.org/>.

mitigation but could have an indirect effect on your mitigation program. The list should also include businesses and non-governmental or nonprofit organizations—charities, churches, and the American Red Cross, as well as operators of critical facilities, colleges, and universities—since they play important roles in pre- and post-disaster environments.

Planning team members will need to interview department or division heads in your local government to obtain information on all relevant programs, policies, regulations, funding, and practices. However, before talking with officials it is advisable to review reports, plans, and other community documents that are readily available to get a basic understanding of what exists in your jurisdiction. In this way, you can target or better tailor your questions when you interview them. By interviewing local officials, the planning team will gain a better understanding of the functions of relevant government agencies to determine whether their missions can, or already do, facilitate mitigation goals and objectives.

When completing the worksheet, be sure to note the sources and types of data that these agencies or organizations possess, and the databases, analytical tools (e.g., GIS, HAZUS, etc.), and software they use to analyze the information.



**An excellent Web site** for help in evaluating building codes and local general plans is <http://www.ibhs.org>. The Institute for Business and Home Safety has developed the *Community Land Use Evaluation for Natural Hazards Questionnaire* ([http://www.ibhs.org/land\\_use\\_planning](http://www.ibhs.org/land_use_planning)). It has also produced *Summary of State Land Use Planning Laws* (2002) ([http://www.ibhs.org/research\\_library/view.asp?id=302](http://www.ibhs.org/research_library/view.asp?id=302)) and *Summary of State Mandated Codes* (1999) ([http://www.ibhs.org/dg.lts/id.112/research\\_library.view.htm](http://www.ibhs.org/dg.lts/id.112/research_library.view.htm)).

Compiling this inventory will help the planning team identify what is currently being done and begin to assess what is working well. The second part of a capability assessment is the analysis of how effective the existing actions and capacities are and what gaps exist that hinder implementation. This evaluation allows the planning team to identify what may need to change to enhance what is working, or what to put into place to undertake new actions or implement existing ones. However, the more extensive analysis will occur when the planning team evaluates specific alternative mitigation actions by objective, as described in the next task.





**Worksheet #3 Local Mitigation Capability Assessment**

**step 2**

*List the name of the agency and its mission in the first column. By identifying the missions and functions, as well as programs, plans, policies, regulations, funding, and other practices administered by that agency, local and tribal jurisdictions create an inventory of resources that can be brought to bear on mitigation efforts within the community or tribe. Use Worksheet #2: State Mitigation Capability Assessment and Worksheet Job Aid #2 in Appendix D to complete this worksheet.*

*List any programs, plans, policies, etc., this agency has in the second column. It is important to include within this column any legal authorities (which can be found by reviewing the state capability assessment) that govern how land would be developed within hazard areas. Typically, these types of regulations are found in local zoning, building, subdivision, and other special land development codes (such as floodplain management ordinances, hillside ordinances, etc.). You should also take the opportunity to include any resources that this organization has developed for local use as part of each respective program. Include any appropriate legal citations or source references for programs, regulations, policies, etc.*

*If you know a point of contact, list it in the third column.*

*Check off whether the programs, plans, policies, etc., have an effect on loss reduction. Communities and tribes should now evaluate the effects or implications of these activities on efforts to reduce losses within the jurisdiction (fourth column). The essential questions to be answered are: Does/would this program/plan/policy etc., support or facilitate mitigation efforts, or does/would it hinder these efforts? How or why? Put these reasons in the Comments column. At this point, you will not try to resolve any issues (such as if a particular program or policy could negatively affect proposed mitigation efforts), but the planning team will carry this information forward as input into the evaluation of specific actions in Task C.*

*Finally, add any other comments you may have about the agency or its activities in the last column.*

Agency Name (Mission/Function)	Programs, Plans, Policies, Regulations, Funding, or Practices	Point of Contact Name, Address, Phone, Email	Effect on Loss Reduction* (✓)			Comments
			Support	Facilitate	Hinder	
Department of Public Works  (To ensure the proper functioning of public infrastructure.)	1. Sanitation Division	M. T. Trashmore 800 Dumptruck Ave. Hazardville, EM (555) 555-1234		✓		Responsible for cleaning storm drains, gutters, roadside ditches, etc.
	2. Stream maintenance policy	M. T. Trashmore			✓	Streams and culverts are only scheduled to be cleaned/maintained every 3 years.
	3. Transportation Division	Potsy McAsphalt 495 Mixing Bowl Lane Hazardville, EM (555) 555-1235	✓			State DOT maintains funds to renovate state highways and bridges. Priority given to elevating structures vulnerable to flooding.

**\*Definitions:**

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**Facilitate:** Programs, plans, policies, etc., that make implementing mitigation actions easier.

**Hinder:** Programs, plans, policies, etc., that pose obstacles to implementation of mitigation actions.

## **Task C. Evaluate, select, and prioritize mitigation actions.**

In this task, the planning team will select mitigation actions suitable to your community and then decide in what sequence or order these actions should be pursued. Task C includes *suggested* methods for evaluating and prioritizing the alternative mitigation actions identified in Task A. There are other ways to evaluate and prioritize mitigation actions. However, the methods suggested here will help the planning team fulfill DMA 2000 requirements that require state, tribal, and local governments to show how mitigation actions were evaluated and prioritized.

Remember, your evaluation should determine whether the action would work for the *specific* mitigation objectives you formulated in Step 1. Your evaluation is not a judgment of the general merits of the action, but an assessment of the effect the action will have on the specified mitigation objective in a particular location within your jurisdiction.

The planning team should agree on the evaluation criteria and the process for prioritizing mitigation actions. See *Getting Started* (FEMA 386-1) for ideas on gaining consensus.

### ***1. Evaluate alternative mitigation actions.***

Now that the planning team has completed Worksheet #1 and the capability assessment (Worksheet #3) in Task B, it must evaluate whether existing and potential alternative mitigation actions fulfill your objectives and if they are appropriate for the planning area. There are many ways to develop and apply evaluation criteria. One method enables the planning team to consider in a systematic way the **S**ocial, **T**echnical, **A**dministrative, **P**olitical, **L**egal, **E**conomic, and **E**nvironmental (STAPLEE) opportunities and constraints of implementing a particular mitigation action in your jurisdiction. The planning team can use **Worksheet #4: Evaluate Alternative Mitigation Actions** to record the team's discussions.

The box that follows provides a list of the types of questions you can ask as part of the evaluation process to help you sort through which alternative actions may be best for your community. All of this information is intended to help the planning team weigh the pros and cons of different alternative actions for each of the identified objectives. However, this decision-making is not necessarily a straightforward process; it is highly specific to each jurisdiction. This process would be difficult to describe in a step-by-step procedure that would reliably lead all communities to the "right" solu-



tion, as the possible results or end products of the process are quite varied and do not necessarily follow a straight path.

## EVALUATION CRITERIA FOR MITIGATION ACTIONS

The following discussion explains each of the STAPLEE evaluation criteria. It includes examples of questions the planning team should consider, as well as who may be the appropriate person or agency to answer these questions as the team works through the list of alternative mitigation actions.

**SOCIAL.** The public must support the overall implementation strategy and specific mitigation actions. Therefore, the projects will have to be evaluated in terms of *community acceptance* by asking questions such as:

- Will the proposed action adversely affect one segment of the population?
- Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
- Is the action compatible with present and future community values?
- If the community is a tribal entity, will the actions adversely affect cultural values or resources?

Your local elected officials, community development staff, and planning board are key team members who can help answer these questions.

**TECHNICAL.** It is important to determine if the proposed action is *technically feasible*, will help to reduce losses in the *long term*, and has minimal *secondary impacts*. Here, you will determine whether the alternative action is a whole or partial solution, or not a solution at all, by considering the following types of issues:

- How effective is the action in avoiding or reducing future losses? If the proposed action involves upgrading culverts and storm drains to handle a 10-year storm event, and the objective is to reduce the potential impacts of a catastrophic flood, the proposed mitigation cannot be considered effective. Conversely, if the objective were to reduce the adverse impacts of frequent flooding events, the same action would certainly meet the technical feasibility criterion.
- Will it create more problems than it solves?
- Does it solve the problem or only a symptom?

Key team members who can help answer these questions include the town engineer, public works staff, and building department staff.

**ADMINISTRATIVE.** Under this part of the evaluation criteria, you will examine the anticipated *staffing*, *funding*, and *maintenance* requirements for the mitigation action to determine if the jurisdiction has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.

- Does the jurisdiction have the capability (staff, technical experts, and/or funding) to implement the action, or can it be readily obtained?
- Can the community provide the necessary maintenance?
- Can it be accomplished in a timely manner?

(continued on page 2-14)

### The U.S. State and Local Gateway

is an invaluable resource for understanding a range of community governmental capabilities. The Web site was developed to give state, local, and tribal government officials and employees access to a variety of federal, state, local, tribal, and organizational information and links. The site includes links to funding, best practices, tools, training, laws and regulations, current issues, partners, and other information by topic. The site can be accessed at [http://www.firstgov.gov/Government/State\\_Local.shtml](http://www.firstgov.gov/Government/State_Local.shtml).

### Funding

Spending is a fundamental power of local government. Spending decisions made at all levels of government can include consideration of hazard mitigation goals and objectives. Annual budgets and capital improvement plans offer an opportunity to include the costs of mitigation activities as part of routine state, community, or tribal outlays, rather than considering mitigation projects as separate special initiatives. Just as communities have the power to spend, they also have the power to withhold spending for the public good. Does your state

or community have the authority to withhold spending in hazard areas? For example, Florida Rule 9J5 discourages the extension of public infrastructure into coastal high-hazard zones by local communities.



**Current elected officials** often have very different priorities than their predecessors, and every elected official is likely to have his or her own agenda driving these priorities. However, elected officials are voted into their position to represent their constituents, and if your team has done a good job of getting the public to buy into and support your plan, elected officials are more likely to lend their support. This may be particularly important if your plan proposes to use a significant amount of tax revenue or other public funds to finance mitigation projects.

### State and local level government

politics and processes can sometimes be difficult to fully understand. An online study guide, which was designed to accompany *State and Local Politics*, Tenth Edition, by Burns, Peltason, and Magleby, provides an objective overview of the institutions and political forces that can shape policies and outcomes in state and local jurisdictions. The study guide is available at <http://cwx.prenhall.com/bookbind/pubbooks/burns6/>.



### An excellent resource

to assist in quickly determining your state's legal authorities with respect to planning to reduce natural hazard losses is available in an online report titled *A Survey of State Land-Use and Natural Hazards Planning Laws*. This report can be found at [http://www.ibhs.org/land\\_use\\_planning/](http://www.ibhs.org/land_use_planning/). The Web site also provides information on state-level technical assistance that is available through statutory requirements.



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**POLITICAL.** Understanding how your current community and state political leadership feels about issues related to the environment, economic development, safety, and emergency management will provide valuable insight into the level of political support you will have for mitigation activities and programs. Proposed mitigation objectives sometimes fail because of a lack of political acceptability. This can be avoided by determining:

- Is there *political support* to implement and maintain this action?
- Have political leaders participated in the planning process so far?
- Is there a *local champion* willing to help see the action to completion?
- Who are the stakeholders in this proposed action?
- Is there enough *public support* to ensure the success of the action?
- Have all of the stakeholders been offered an opportunity to participate in the planning process?
- How can the mitigation objectives be accomplished at the lowest “cost” to the public?

Ensure that a designated member of the planning team consults with the board of supervisors, mayor, city council, administrator, or manager.

**LEGAL.** Without the appropriate legal authority, the action cannot lawfully be undertaken. When considering this criterion, you will determine whether your jurisdiction has the legal authority at the state, tribal, or local level to implement the action, or whether the jurisdiction must pass new laws or regulations. Each level of government operates under a specific source of delegated authority. As a general rule, most local governments operate under enabling legislation that gives them the power to engage in different activities.

You should identify the unit of government undertaking the mitigation action, and include an analysis of the interrelationships between local, regional, state, and federal governments. Legal authority is likely to have a significant role later in the process when your state, tribe, or community will have to determine how mitigation activities can best be carried out, and to what extent mitigation policies and programs can be enforced.

- Does the *state, tribe, or community* have the *authority* to implement the proposed action?
- Is there a technical, scientific, or legal basis for the mitigation action (i.e., does the mitigation action “fit” the hazard setting)?
- Are the proper laws, ordinances, and resolutions in place to implement the action?
- Are there any potential legal consequences?
- Will the community be liable for the actions or support of actions, or lack of action?
- Is the action likely to be *challenged* by stakeholders who may be negatively affected?

Your community's legal counsel is a key team member to include in this discussion.

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### State, Local, and Tribal Authorities

State governments possess an inherent power (also called “police power”) to enact reasonable legislation and protect the health, safety, and welfare of the public. The Tenth Amendment of the U.S. Constitution delegates this power to states, which in turn, through their state constitutions, delegate some of these powers to local governments.

Laws, legislation, and related topics for **tribal** governments can be found at <http://www.findlaw.com/01topics/21indian/index.html>. The Web page includes links to law documents, briefs, articles, databases, government agencies, political information, and other related Web sites.

Most local governments are given a fair amount of autonomy to enforce their police power, particularly as it pertains to emergency management functions. State legislation, however, controls what local governments can legally do. While certain federal laws may have bearing on local government activities, the local government must have the proper delegation from the state in order to act. States grant local governments the authority to exercise powers in two ways:

**Dillon’s Rule.** Local governments in states with this type of legislative structure are only able to exercise powers that have been expressly granted to them in their state constitution or state laws.

**Home Rule.** Local governments in states with this type of legislative structure have much greater flexibility in their organizational structure, fiscal control, and governmental autonomy, as long as an activity is not prohibited by state legislation or in conflict with any state statute or the state constitution.

For more information, see <http://www.naco.org/pubs/research/briefs/dillon.cfm>.



### Examples of Local Police Powers

**Regulation.** Most states have granted local jurisdictions broad regulatory powers to enable the enactment and enforcement of ordinances that deal with public health, safety, and welfare. These include building codes, building inspections, zoning, floodplain and subdivision ordinances, and growth management initiatives.

**Acquisition.** Removing at-risk property from the private market is a useful mitigation tool. Legislation typically empowers governments to acquire property for public purposes by gift, grant, bequest, exchange, purchase, lease, or eminent domain. Land acquired for these purposes, however, must be given just compensation in return, or it is considered a taking. All of FEMA’s buyout programs operate on the basis of the *voluntary cooperation* of property owners.

**Taxation.** Taxes and special assessments can be an important source of revenue for governments to help pay for mitigation activities. In addition, the power of taxation can have a profound impact on the pattern of development in local communities. Special tax districts, for example, can be used to discourage intensive development in hazard-prone areas.



**eminent domain** *n.* the right of a government to appropriate private property for public use, usually with compensation to the owner.



### Takings

Regulating development on private property can be contentious and even litigious, particularly if the regulations are so restrictive that they constitute a “taking,” or if they are arbitrarily applied or enforced. The Fifth Amendment of the U.S. Constitution has a Takings Clause requiring that owners of private property taken for public use be given “just compensation.” A regulatory “taking” is a regulation or action that causes a private landowner to lose *all* economically beneficial use of his or her land. Care must be taken in drafting legislation that may reduce the fair market value of land. Any required changes in the use of private property must be clearly related to public health and safety concerns.



## Benefit-Cost Analysis



All projects using federal funds must be justified as being cost-effective. This can be determined through the use of various benefit-cost analysis methodologies, addressed in *Using Benefit-Cost Analysis in Mitigation Planning* (FEMA 386-5).

## Grants and services



from foundations, environmental organizations, volunteer groups, and other nonprofit organizations may be worth considering, as such organizations are often willing to contribute financial or other resources if they feel there is a significant need. Private industry, investors, and the business community should also be considered for potential sources of funding and in-kind services. As you review your state or community's fiscal capacity, continue to add new information to your list of potential funding sources identified earlier in the planning process. How to research and obtain funding for mitigation is discussed in more detail in *Securing Resources for Mitigation Planning* (FEMA 386-9).

Local foundations often play leadership roles in communities and can provide financial resources, technical assistance, and support. A complete list of community nonprofit, tax-exempt, publicly supported grant making organizations by state is available at <http://www.tgci.com/resources/foundations/community/index.html> or <http://www.tgci.com/resources/foundations/SearchGeoloc.asp>.

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**ECONOMIC.** Every local, state, and tribal government experiences budget constraints at one time or another. Cost-effective mitigation actions that can be funded in current or upcoming budget cycles are much more likely to be implemented than mitigation actions requiring general obligation bonds or other instruments that would incur long-term debt to a community. States and local communities with tight budgets or budget shortfalls may be more willing to undertake a mitigation initiative if it can be funded, at least in part, by outside sources. "Big ticket" mitigation actions, such as large-scale acquisition and relocation, are often considered for implementation in a post-disaster scenario when additional federal and state funding for mitigation is available.

Economic considerations must include the present economic base and projected growth and should be based on answers to questions such as:

- Are there currently sources of funds that can be used to implement the action?
- What *benefits* will the action provide?
- Does the *cost* seem reasonable for the size of the problem and likely benefits?
- What burden will be placed on the tax base or local economy to implement this action?
- Does the action *contribute to other community economic goals*, such as capital improvements or economic development?
- What proposed actions should be considered but be "tabled" for implementation until *outside sources of funding* are available?

Key team members for this discussion include community managers, economic development staff, and the assessor's office.

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## The Catalog of Federal Domestic Assistance Programs

(CFDA) is a collection of federal programs, projects, services, and activities that provide assistance or benefits to the American public. Available federal assistance includes grants, loans, loan guarantees, services, and other types of support. The online document is available at <http://aspe.os.dhhs.gov/cfda>.





## Economic Analysis Tool Box

**Local Economic Analysis Tools.** The National Association of Counties (NACo) collects, maintains, researches, and publishes economic and other information about counties. Reports are available online at <http://www.naco.org/pubs/research/special/index.cfm>. NACo also is currently developing a database of county policies, ordinances, and model programs that could be used as case studies for other communities.

Thirty-five of America's largest cities and 40 of America's largest counties were graded on their financial, human resources, and information technology management, and managing for results performance by the Maxwell Campbell Public Affairs Institute. The annual report for these cities and counties is available online at <http://www.governing.com/gpp/2000/gp0intro.htm> and <http://www.governing.com/gpp/2002/gp2intro.htm>, respectively.

Nationwide county data, including demographic and economic data and other statistics, can be found at <http://www.Capitolimpact.com>.

The National League of Cities researches and reports on programs and issues affecting cities and towns nationwide. The latest annual report focuses on recent trends in municipal finance and fiscal policy actions. According to the report, the methodology used should provide good generalized information about cities with populations of 10,000 or more. The report is available online at [http://www.nlc.org/nlc\\_org/site/programs/research\\_reports/index.cfm](http://www.nlc.org/nlc_org/site/programs/research_reports/index.cfm).

**Tribal Economic Analysis Tools.** The U.S. Department of Commerce, Economic Development Administration funded a report entitled *Job Creation and Job Skills Development in Indian Country*. It evaluated current literature on job creation and job skills in tribal communities and assessed tribal economic development-related issues. The report can be accessed at the following Web site: [http://www.osec.doc.gov/eda/html/1g3\\_researchrpts.htm](http://www.osec.doc.gov/eda/html/1g3_researchrpts.htm).

Native economic Development Guidance and Empowerment (eDGE) is an interagency initiative of the federal government to promote economic development within tribal and Alaska Native communities. Native eDGE provides links to federal and non-federal grants, loans, and technical assistance for tribal and Alaska Native organizations and individuals. The Web site is located at <http://nativeedge.hud.gov/>.

**Regional Economic Analysis Tools.** The National Association of Regional Councils (NARC) has compiled demographic information for regional councils within each state. NARC also has several publications that contain information on gathering baseline data, economic development strategies, and a directory of regional councils. This information can be helpful in determining current trends in government and can give you data that will be useful if you are undertaking a multi-jurisdictional plan. The association's Web site is located at <http://www.narc.org/>.

**HAZUS**

**HAZUS, FEMA's natural hazard loss estimation tool**, has an extensive inventory of data that communities can use and build upon. HAZUS-MH, the new multi-hazard version of HAZUS, includes data from the 2000 U.S. Census. See FEMA's Web site for more details: <http://www.fema.gov/hazus/index.shtm>.

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**ENVIRONMENTAL.** Impact on the environment is an important consideration because of public desire for sustainable and environmentally healthy communities and the many statutory considerations, such as the National Environmental Policy Act (NEPA), to keep in mind when using federal funds.

You will need to evaluate whether, when implementing mitigation actions, there would be negative consequences to environmental assets such as threatened and endangered species, wetlands, and other protected natural resources.

- How will this action affect the environment (*land, water, endangered species*)?
- Will this action comply with local, state, and *federal environmental laws or regulations*?
- Is the action *consistent with community environmental goals*?

Numerous mitigation actions may well have beneficial impacts on the environment. For instance, acquisition and relocation of structures out of the floodplain, sediment and erosion control actions, and stream corridor and wetland restoration projects all help restore the natural function of the floodplain. Also, vegetation management in areas susceptible to wildfires can greatly reduce the potential for large wildfires that would be damaging to the community and the environment. Such mitigation actions benefit the environment while creating sustainable communities that are more resilient to disasters.

Key team members include the local health department, conservation commissions, environmental or water resources agency, building officials, environmental groups, fish and game commissions, etc.

**SUMMARY.** In many cases, it will not be possible to simply attend a planning meeting and answer these questions. In those cases, designated team members will need to investigate the issues further and report back to the team. See Table 2-1 for considerations and sources of information for each mitigation evaluation criterion.



Table 2-1 suggests some considerations and sources of information for each STAPLEE criterion to use when completing Worksheet #4.

**Table 2-1: Researching STAPLEE Criteria**

<b>Evaluation Category</b>	<b>Considerations</b>	<b>Sources of Information</b>
<b>Social</b>	Community Acceptance	<ul style="list-style-type: none"> <li>■ Questionnaire (see Appendix E)</li> <li>■ Interviews with government staff, non-profit organizations, and neighborhood advocacy organizations</li> <li>■ Community plans</li> <li>■ Newspaper articles</li> </ul>
	Adversely Affects Segment of Population	<ul style="list-style-type: none"> <li>■ Maps showing demographics (race, age, income, voting districts, etc.) with locations of proposed mitigation actions</li> </ul>
<b>Technical</b>	Technical Feasibility	<ul style="list-style-type: none"> <li>■ Judgment of mitigation experts, scientists, and engineers</li> <li>■ Existing literature/studies on the action</li> </ul>
	Long-term Solution	<ul style="list-style-type: none"> <li>■ Judgment of mitigation experts</li> <li>■ Existing literature/studies on the action</li> </ul>
	Secondary Impacts	<ul style="list-style-type: none"> <li>■ Judgment of mitigation experts</li> <li>■ Existing literature</li> <li>■ Maps showing environmentally sensitive resources with locations of proposed mitigation actions</li> <li>■ Scientific and/or engineering evaluations</li> </ul>
<b>Administrative</b>	Staffing (sufficient number of staff and training)	<ul style="list-style-type: none"> <li>■ Capability assessment (see Worksheets #2 and #3)</li> <li>■ Jurisdiction organizational chart</li> <li>■ Availability of technical assistance from regional or state agencies</li> <li>■ Interviews with department heads and relevant staff</li> </ul>
	Funding Allocated	<ul style="list-style-type: none"> <li>■ Capability assessment (see Worksheets #2 and #3)</li> <li>■ Annual operating budget</li> <li>■ Capital improvement budget</li> <li>■ Interviews with department heads and relevant staff</li> </ul>
	Maintenance/Operations	<ul style="list-style-type: none"> <li>■ Capability assessment (see Worksheets #2 and #3)</li> <li>■ Existing literature on maintenance costs</li> <li>■ Interviews with department heads and relevant staff</li> </ul>
<b>Political</b>	Political Support	<ul style="list-style-type: none"> <li>■ Questionnaire (see Appendix E)</li> <li>■ Interviews with elected officials</li> <li>■ Newspaper articles</li> </ul>
	Local Champion or Plan Proponent (respected community member)	<ul style="list-style-type: none"> <li>■ Questionnaire (see Appendix E)</li> <li>■ Interviews with elected officials, community leaders, and private sector participants in planning process</li> </ul>
	Public Support (Stakeholders)	<ul style="list-style-type: none"> <li>■ Questionnaire (see Appendix E)</li> <li>■ Interviews with government staff, non-profit organizations, and neighborhood advocacy organizations</li> <li>■ Newspaper articles</li> <li>■ Public meetings</li> </ul>

**Table 2-1: Researching STAPLEE Criteria (continued)**

Evaluation Category	Considerations	Sources of Information
<b>Legal</b>	State Authority	<ul style="list-style-type: none"> <li>■ Research of state codes</li> <li>■ Contact with state attorney general's office</li> </ul>
	Existing Local Authority	<ul style="list-style-type: none"> <li>■ Research of local codes and ordinances</li> <li>■ Local legal counsel</li> </ul>
	Action Potentially Subject to Legal Challenge by Opponents (stakeholders who would be negatively affected)	<ul style="list-style-type: none"> <li>■ Research by local legal counsel</li> <li>■ Maps, census, plans</li> </ul>
<b>Economic</b>	Benefit of Mitigation Action	<ul style="list-style-type: none"> <li>■ Benefit-cost analysis software/methodology</li> <li>■ Judgment of experts</li> <li>■ Existing literature</li> <li>■ Case studies of similar implemented actions</li> <li>■ Economic impact assessment</li> </ul>
	Cost of Mitigation Action	<ul style="list-style-type: none"> <li>■ Order of magnitude cost estimate (e.g., Action A costs five times more than Action B)</li> <li>■ Judgment of experts</li> <li>■ Local contractors</li> <li>■ Case studies</li> </ul>
	Contributes to Economic Goals	<ul style="list-style-type: none"> <li>■ Judgment of experts</li> <li>■ Evaluation of community's comprehensive plan, economic development plan, and other community plans and policies</li> </ul>
	Outside Funding Required	<ul style="list-style-type: none"> <li>■ Order of magnitude cost estimate</li> <li>■ Evaluation of state and federal funding programs</li> </ul>
<b>Environmental</b>	Affects Land/Water Bodies	<ul style="list-style-type: none"> <li>■ Maps, studies, plans</li> <li>■ Coordination with state and federal resource agencies, including compliance with all relevant statutes and regulations</li> </ul>
	Affects Endangered Species	<ul style="list-style-type: none"> <li>■ Maps, studies, plans</li> <li>■ Coordination with state and federal resource agencies, including compliance with all relevant statutes and regulations</li> </ul>
	Affects Hazardous Materials and Waste Sites	<ul style="list-style-type: none"> <li>■ Maps, studies, plans</li> <li>■ Hazardous waste site databases</li> <li>■ Coordination with state and federal resource agencies, including compliance with all relevant statutes and regulations</li> </ul>
	Consistent with Community's Environmental Goals	<ul style="list-style-type: none"> <li>■ Maps of land use, zoning, sensitive areas, projected growth</li> <li>■ Interviews with government staff</li> <li>■ Review of local plans and policies</li> </ul>
	Consistent with Federal Laws	<ul style="list-style-type: none"> <li>■ Contact with federal agencies</li> </ul>



**Worksheet #4**

**Evaluate Alternative Mitigation Actions**

**step 2**

1. Fill in the goal and its corresponding objective. Use a separate worksheet for each objective. The considerations under each criterion are suggested ones to use; you can revise these to reflect your own considerations (see Table 2-1).

2. Fill in the alternative actions that address the specific objectives the planning team identified in Worksheet #1.

3. **Scoring:** For each consideration, indicate a plus (+) for favorable, and a negative (-) for less favorable.

When you complete the scoring, negatives will indicate gaps or shortcomings in the particular action, which can be noted in the Comments section. For considerations that do not apply, fill in N/A for not applicable. Only leave a blank if you do not know an answer. In this case, make a note in the Comments section of the “expert” or source to consult to help you evaluate the criterion.

**Goal:** Minimize losses to existing and future structures within hazard areas.

**Objective:** Reduce potential damages to the manufactured home park in the floodplain.

STAPLEE Criteria Considerations → for Alternative Actions ↓	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Community Environmental Goals	Consistent with Federal Laws
1. Acquire flood-prone structures	-	-	+	+	+	-	-	-	-	+	+	+	+	+	-	-	-	+	+	+	+	+	+
2. Construct a berm around park	+	+	-	-	-	-	-	-	+	+	-	+	+	+	-	+	+	-	-	+	+	+	+
3. Elevate structures	+	+	-	+	-	-	-	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	+

Alternative Actions	Comments
1. Acquire flood-prone structures	Will need to seek outside funding.
2. Construct a berm around park	Will not provide 100-year flood protection to most homes. May be best for units that have not been purchased or elevated.
3. Elevate structures	Don't know what effect the action will have on older, less sturdy structures. Would need to determine structural integrity of older homes. Further study may be necessary.



## As you start the prioritization process,



look for ways to eliminate from consideration those actions that, from a **technical** standpoint, will not meet your objective, even though they may have been indicated as generally applicable to your situation. For example, if an alternative mitigation action is to relocate a building out of the floodplain, the building may be structurally unsound and may not survive a move. Such an action can now be eliminated from your list and there is no need to undertake a detailed evaluation of the remaining criteria, thereby saving you time. You should provide comments—a short summary of your reasoning—in Worksheet #4 indicating why you believe your actions will not work. If you cannot judge the action on its technical merits because of a lack of data, document that fact in the “Comments” section. Items in the “Comments” section can then lead to developing a list of necessary implementation steps, such as conducting additional studies.

A community can go through a process of identifying and evaluating alternative mitigation actions and discover that everything is in place to undertake a certain type of action that would be very effective and easily affordable. However, the community simply may not like some of the social or environmental implications of that action. The Town of Hazardville faces this type of issue with its historic lighthouse. One solution would be to move the lighthouse inland to remove it from the danger it faces from the eroding cliffs. But, the community would then lose the historic and cultural value of its long-standing position at the main entrance to town overlooking the sea. As such, the planning team may decide to undertake a more expensive or difficult action that it is not necessarily as equipped for but feels strongly should be the preferred alternative. Table 2-2 presents five possible situations the planning team could encounter.



### At times, you may feel that your community does not have enough information

about a specific situation to recommend a particular mitigation action. In these cases, your mitigation action can be to recommend further study. For example, if your community has 20 critical facilities that should be addressed in the plan, how do you decide which ones should be dealt with first, and what type of action should be used for mitigation? In a situation like this, your recommendation could be to “Conduct an investigation of the 20 critical facilities over the next three years to determine the most appropriate mitigation actions to protect them from flooding, high winds, and seismic hazards.”

## HAZUS

### HAZUS can provide information to help evaluate different mitigation approaches for a given problem.

Sophisticated HAZUS users interested in developing more detailed damage and loss estimates for individual or groups of buildings can use HAZUS-MH, which comes with two useful tools: AEBM (Advanced Engineering Building Module) and InCast (Inventory Collection and Survey Tool). For earthquake mitigation purposes, using the AEBM creates building-specific damage and loss functions that could be used to assess losses for an individual building (or group of similar buildings) both in their existing condition and after some amount of seismic rehabilitation. Building-specific damage and loss functions are based on the properties of a particular building. The particular building of interest could be either an individual building or a typical building representing a group of buildings. The procedures are highly technical, and users should be qualified seismic/structural engineers who, for example, might be advising a local jurisdiction regarding the merits of adopting an ordinance to require cripple-wall strengthening of older wood-frame residences. The AEBM concept will be expanded to other hazards in future HAZUS models.

For better characterization of damages to individual structures or groups of buildings, the multi-hazard InCast tool allows users to input building-specific characteristics such as location, occupancy type, and structural information. The InCast data integrates seamlessly within HAZUS-MH and can provide enhanced and more complete building inventories, thus improving the reliability of risk assessment results.





**Table 2-2: Potential Results of the Evaluation of Alternative Mitigation Actions**

This table illustrates the type of situations that may arise when evaluating mitigation actions. The intent is to help the planning team understand that the decision-making process can lead to a variety of different types of recommendations—from clear-cut actions to seeking more information to combinations of different actions. The point is that the planning team is highly unlikely to face a situation that has no prospects for any type of meaningful mitigation.

Situation	Example	Recommendation (What would you do?)
<p><b>1. A single preferred alternative action can be identified to meet an objective.</b></p> <p>In this situation, the community has sufficient data to provide a clear understanding of the nature of the problem, and an alternative action can be identified for which funding is readily available and all the necessary capabilities are in place. In addition, the alternative action is generally consistent with the needs and values of the community.</p> <p><i>Note: A desirable result, but the least common to occur.</i></p>	<p>For a hypothetical objective to "reduce flood losses" in a particular part of a community, an alternative might be to <b>"acquire properties subject to repetitive flood loss and relocate structures to city-owned land."</b></p> <p>The ideal situation would include the availability of federal grant monies and local matching funds to acquire properties and relocate the subject structures to city-owned land. If this land is outside of the floodplain, is properly zoned, and can be deeded to landowners without the objections of the adjacent property owners, there should be no hesitation on the part of the community to select and implement this alternative.</p>	<p><b>Select the alternative.</b></p>
<p><b>2. Two or more alternative actions seem technically feasible and acceptable, but more data is needed to determine which is most appropriate.</b></p> <p><i>Note: A very common result.</i></p>	<p>Again for a generic objective to "reduce potential damage to critical facilities located in the floodplain," alternative mitigation actions could include:</p> <p><b>Alternative A: Relocate critical facilities in the floodplain to less hazard-prone areas.</b></p> <p><b>Alternative B: Retrofit critical facilities in the floodplain.</b></p> <p>In this situation, if the planning team does not have enough details about the condition of a particular facility to determine if it is a good candidate for relocation or would benefit more from retrofitting, they will be hard pressed to make the choice.</p> <p>The planning team could elect to recommend a study to assess the condition of the facility and then determine which action is most appropriate.</p>	<p><b>Identify a study to determine which alternative is most appropriate as an action item in the implementation strategy.</b></p> <p><i>Note: The time frame required for studies can vary widely. If the results of the study become available within the "planning horizon," then it would be appropriate for the planning team to take up the consideration of these alternatives as part of a process of periodic updates and refinements of the plan (see FEMA 386-4).</i></p>
<p><b>3. A low-cost alternative action is identified that is possible to accomplish immediately, but is not as effective and/or desirable as another alternative action that requires the acquisition of significant resources.</b></p> <p><i>Note: Another very common result.</i></p>	<p>For an objective to "protect structures in the urban/wildland interface," alternatives could very well include:</p> <p><b>Alternative A: Begin a public education campaign to raise awareness of the dangers of wildfires.</b></p> <p><b>Alternative B: Establish a fuel reduction program to assist property owners in the wildland/urban interface.</b></p>	<p><b>Select both alternatives.</b></p>



**Table 2-2: Potential Results of the Evaluation of Alternative Mitigation Actions (continued)**

Situation	Example	Recommendation (What would you do?)
	<p>While Alternative A is less effective, it builds support for Alternative B and has relatively small "hard costs."</p> <p>The planning team can choose to implement the public education campaign, while simultaneously taking steps (such as identifying funding, recruiting staff, preparing a best management practice guide, etc.) toward establishing a fuels reduction program.</p>	
<p><b>4. An alternative action is identified that is possible to accomplish, but is not desirable from the viewpoint of a portion of the community, while another less objectionable alternative action requires the acquisition of significant resources.</b></p> <p><i>Note: A common result that is the most difficult to resolve. These situations are the ones that test both the process and the participants.</i></p>	<p>For a specific objective to "preserve historic structures threatened by coastal erosion" (such as a historic lighthouse that has great cultural value to members of the community), alternative mitigation actions can include:</p> <p><b>Alternative A: Remove historic structures from the coast to safer ground.</b></p> <p><i>Note: This action would afford predictable protection but would permanently alter the historic character of the community. There are also concerns regarding funding and the ability to secure the technical expertise necessary for this option.</i></p> <p><b>Alternative B: Retrofit historic structures to avoid storm surge damage, thereby maintaining the historic character of the community.</b></p> <p><i>Note: This action will require the identification of other sources of funding (grants, donated materials, and in-kind labor); development of staff capabilities; and/or hiring a consultant with expertise in historic preservation. It may not be as effective in the long term in reducing potential damages to the lighthouse.</i></p> <p>In this case, the choice is not clear-cut. If properly designed, the planning team will represent a reasonable cross section of the community, and with adequate public input, will make the decision they feel is in the best interest of the community.</p>	<p><b>Select the alternative that best reflects the "will" of the community.</b></p>
<p><b>5. An alternative action is identified that is desirable in terms of the long-term sustainability of the community, but is opposed by the affected population and requires substantial funds to implement.</b></p> <p><i>Note: A common result.</i></p>	<p>An objective to "substantially reduce or eliminate flood losses" can result in the identification of an alternative to "<b>acquire repetitive loss properties in high-hazard areas.</b>"</p> <p><i>Note: acquisition programs are voluntary and residents often resist this potential disruption of historic and family ties to their property.</i></p>	<p><b>Select the alternative and list it as both a pre- and post-disaster action.</b></p>



**Table 2-2: Potential Results of the Evaluation of Alternative Mitigation Actions (continued)**

Situation	Example	Recommendation (What would you do?)
	<p>This type of action is optimally initiated using pre-disaster funds, with the understanding that complete implementation may not occur until after a disaster. Homeowners may be opposed to moving or may want to prevent a patchwork of open lands and existing homes, but may be more willing to sell if their home is substantially damaged by a hazard event or if several people on the block are willing to sell. Often, the largest amount of funds a community, tribe, or state may receive for mitigation is after a disaster.</p> <p>The committee should still put the acquisition forward as a priority item for mitigation, with the understanding that they may not be able to complete the action until after a disaster.</p>	

**2. Summarize and document recommended mitigation actions.**

After you have evaluated the potential alternative mitigation actions, pull out from Worksheet #4 those actions that the planning team has determined to be appropriate for your community. Clean up the comment notes or expand them to explain any special circumstances that must be kept in mind in the next step. For example, if you found that one action is more effective when undertaken in conjunction with another, then note this fact.

**3. Prioritize selected mitigation actions.**

Now that the planning team has a list of acceptable and doable actions for your community, it's time to prioritize them. You may have identified a dozen actions for each of the hazards affecting your community and are now faced with deciding where to start when you may have more than 50 possible actions. You may want to review your goals and objectives to see if you decided from the onset to address a particular hazard first (e.g., flooding or earthquakes) if the risk assessment and loss estimate found that these occurred more frequently and caused major losses. You should also review and take into account the results of your efforts earlier in Task C, in which you evaluated the alternative mitigation actions appropriate to your particular hazards. You now know, given state and local capabilities, what it would take to implement the alternative actions you ultimately select. Some common ways to rank actions follow. Use **Worksheet #5: Prioritized Alternative Mitigation Actions** to complete this step.



**You may want to refer to your composite vulnerability map**

completed during your risk assessment to review the areas that are highly vulnerable to multiple hazards. One option is to move to the top of the list those actions that address these problem areas.



During this final step, the following considerations should be kept in mind when prioritizing your mitigation actions:

- **Ease of implementation.** To initiate and/or maintain interest in the planning process, particularly if support is tentative, you may want to select those actions that are easily implemented first. Initiatives such as media attention to hazards and risks cost little and reach a large number of citizens.
- **Multi-objective actions.** Some mitigation actions may work toward achieving multiple community goals. For example, an acquisition and demolition project can lead to new open space that provides additional natural storage for floodwaters. This solves the problem of repetitively flooded structures, which are now removed, and provides opportunities for recreational use such as hiking/biking paths.
- **Time.** To demonstrate more immediate progress, you may choose to initiate mitigation actions that are quickly accomplished over those that would take a long time to obtain the necessary approvals or funding to carry out the project. For example, if you decide to implement both riverine and coastal flooding mitigation actions, you may decide to address the riverine flooding first in areas where homeowners and businesses have already expressed an interest in reducing flood damage. After initiating riverine mitigation actions, you may then focus on mitigating coastal flooding in areas where the property owners are perhaps not as aware of the potential benefits of hazard mitigation, and therefore getting their cooperation may take time.
- **Post-disaster mitigation.** A number of potential mitigation actions being evaluated by the planning team may not be able to be implemented in the near term due to funding availability or political and social considerations. In a post-disaster scenario, however, the extent of damages, political will, and access to state and federal mitigation funds can dramatically alter the feasibility of implementation. The acquisition/demolition of flood-prone structures and relocation of residents outside of the floodplain is a prime example. In many cases, this mitigation action becomes more feasible after a disaster. Consider targeting specific mitigation actions for implementation following a major disaster.

A common way to rank actions is to have the planning team vote on the actions; this approach is termed “multi-voting.” All of the



mitigation actions under consideration must be listed so that the entire planning team can see them. Each team member is then given half the total number of potential actions to use as individual votes. See the following table as an example. Assume the planning team consists of nine people; because there are four actions, each member is given two votes to apply to the mitigation actions he or she feels are most important, resulting in a total of 18 votes. The action that receives the most votes is the highest priority; the item with the second most votes is the second priority, etc.

**Multi-Voting Ranking**

Mitigation Action	Number of Votes	Priority
Elevate structures.	3	3
Build a berm around park.	2	4
Acquire flood-prone structures.	8	1
Establish public education and outreach projects.	5	2
TOTAL NUMBER OF VOTES	18	

Numerical ranking is another way to prioritize mitigation actions. Again, all of the mitigation actions are listed and the planning team reviews the entire list. After careful evaluation, the members assign a numerical ranking to each action. You then add the ranks given to the action and the one with the lowest number is the highest priority. If there are a large number of actions and many people voting, you can average the rankings instead of counting each one. See the following table as an example of averaging the rankings. Assume that the planning team consists of four people and each person ranks all four actions from 1-4. The rankings for each action are added and then divided by the number of votes.

For example, in the following table, acquire flood-prone structures received three “1” votes and one “2” vote. These add up to five, which is then divided by four to equal 1.25. Since it is closest to the “1” rank, it becomes the first priority.



### Numerical Ranking

Mitigation Action	Rank Given to the Measure	Sum of the Rankings	Average of Rankings	Priority
Elevate structures.	1,3,4,3	11	2.75	3
Build a berm around park.	4,3,4,4	15	3.75	4
Acquire flood-prone structures.	1,1,2,1	5	1.25	1
Establish public education and outreach projects.	2,3,2,2	9	2.25	2



#### Los Alamos County, New Mexico, experienced a major wildfire in 2000,

which led to the burning of approximately 48,000 acres. When developing its hazard mitigation plan, the county identified a number of objectives, including reducing direct exposure of individual structures to wildfires. For this objective, the

planning team examined several wildfire alternative mitigation actions and narrowed them down to two main alternatives. Several hundred houses were located in the high fire-hazard area. Due to the architectural style of the area, many houses had wood shake shingles as roofing material. The alternative considered was to replace all the wood roofs with fire-retardant shingles. The second alternative was to create defensible space around the houses by strategically managing vegetation to decrease the fuel available for fires adjacent to the structures. The planning committee weighed the cost, the necessary time frame, and the longer-term effects of both alternatives. The cost of the roof replacements was an order of magnitude higher than the vegetation management action, would take longer to implement, and still result in fuel close to the houses. The defensible space action was relatively inexpensive, could be accomplished quickly, and would be effective as long as the vegetation was managed. The defensible space action was determined to be the best solution for the county.





**Worksheet #5 Prioritized Alternative Mitigation Actions**

**step 2**

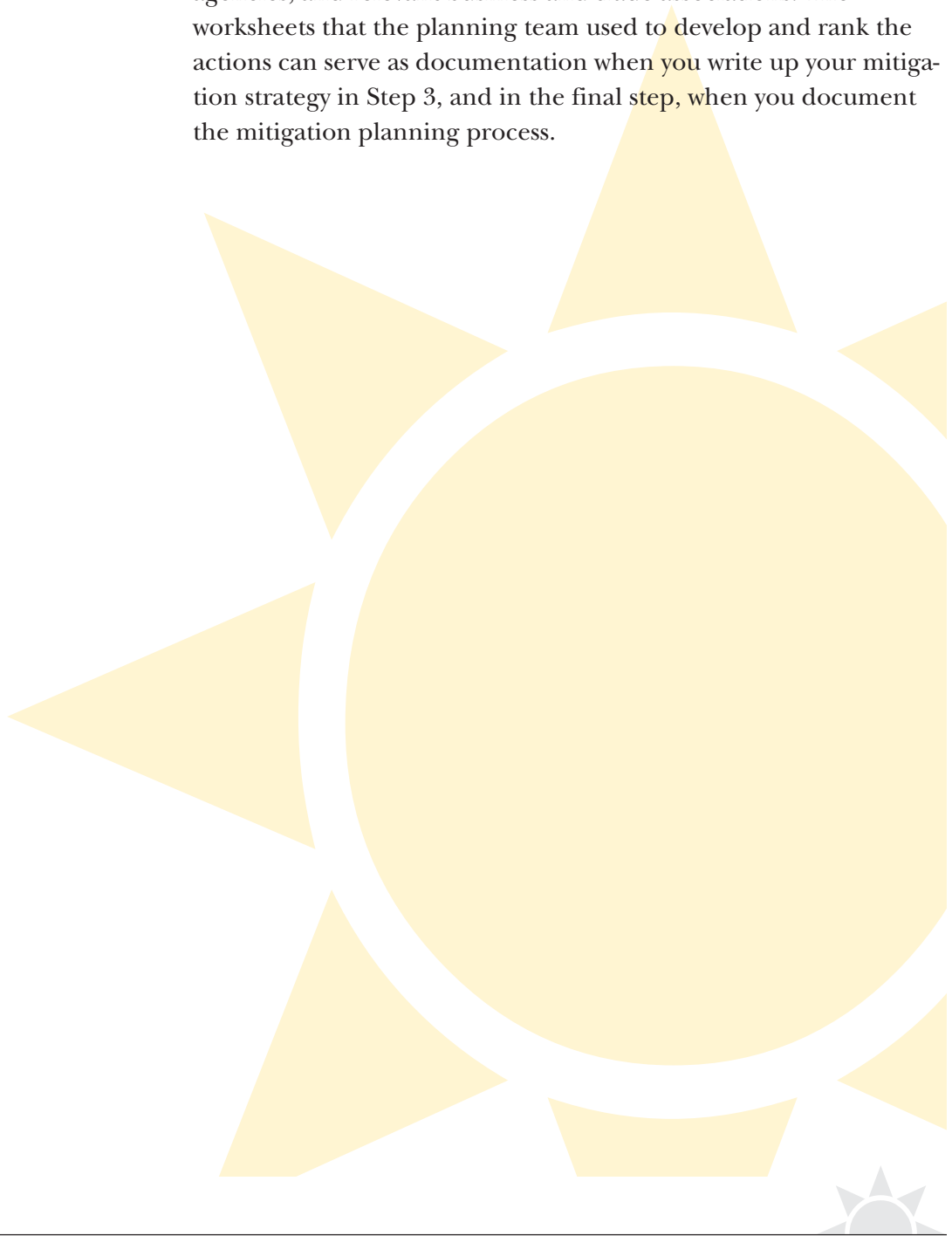
*List the Alternative Mitigation Actions, in order of priority. Identify the goal(s) and corresponding objective(s) each action addresses, and note the sources of information for easy reference and any comments or issues to keep in mind when implementing the action. Note that the prioritized actions in this example cover more than one goal.*

Alternative Actions (In Order of Priority)	Goal(s) and Objective(s) (From Worksheet #1)	Source(s) of Information (From Worksheet #1)	Comments (From Worksheets #1 and #4)
1. Acquire flood-prone structures	Goal: Minimize losses to existing and future structures within hazard areas. Objective: Reduce damages to the manufactured home park in the floodplain.	State Hazard Mitigation Officer	Effective for units with deepest potential flooding (4 feet). Some floodplain residents are just unwilling to sell. A number of elderly renters may be disproportionately affected because there are few affordable rental units in the community. Will need to seek outside funding.
2. Establish public education and outreach projects	Goal: Prevent destruction of forests and structures in the Urban Wildland Interface. Objective: Protect structures in the Urban Wildland Interface.	State of Emergency Dept. of Forestry	Educate homeowners on benefits of creating defensible space. Many defensible space tips are generally low-cost and easy to implement, and many homeowners have expressed a willingness to implement them. Benefits will not necessarily be widespread because it depends on homeowner's initiative to implement.
3. Elevate structures	Goal: Minimize losses to existing and future structures within hazard areas. Objective: Reduce damages to the manufactured home park in the floodplain.	Hazardville Dept. of Public Works	Suitable for structures in good condition. Cost of elevation may outweigh the expected losses to the home. Elevated structures can be more vulnerable to earthquakes, unless more bracing is used. Don't know what effect the action will have on older, less sturdy structures. Would need to determine structural integrity of older homes. Further study may be necessary.
4. Build a berm around park	Goal: Minimize losses to existing and future structures within hazard areas. Objective: Reduce damages to the manufactured home park in the floodplain.	Hazardville Dept. of Public Works	This option would only work in areas where flooding is less than 2 feet deep, according to our risk assessment. Best used for units that have not been purchased or elevated.



## Summary

Once you have finished with this step, you will have a list of socially acceptable, prioritized actions that address the problems identified in your community or state. They will be technically and administratively feasible, politically acceptable, legal, economically sound, and not harmful to the environment. You will have consulted a variety of sources, and obtained input from the public, community planners, subject matter experts from appropriate government agencies, and relevant business and trade associations. The worksheets that the planning team used to develop and rank the actions can serve as documentation when you write up your mitigation strategy in Step 3, and in the final step, when you document the mitigation planning process.



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## THORR Identifies Mitigation Actions

(Part 2 of a 4-Part Series on the Mitigation Strategy Process)

**[Hazardville, EM]** The Town of Hazardville Organization for Risk Reduction (THORR) has identified several mitigation actions to get Hazardville on the road to being disaster resistant. The mitigation actions were developed by five different workgroups consisting of a diverse group of citizens from all sections of town. Each workgroup was given one of the goals developed on February 4, 2002, and the accompanying objectives to help them develop mitigation strategies. The workgroups then researched each problem over the course of one month and developed a list of alternatives to solve the problem. In order to come up with viable alternative mitigation actions, each group gathered to discuss the goals and associated objectives, brainstorming to create a list of all possible mitigation actions to address the problems. Each idea was thoroughly discussed and debated within the group.

In the end, all of the alternative mitigation actions were evaluated based on the following criteria, known as STAPLEE:

1. **Social:** Is the action socially acceptable (is it compatible with present and future community values)?
2. **Technical:** Is the measure technically feasible?
3. **Administrative:** Does the community have the capability to implement and maintain the action?
4. **Political:** Is there public support both to implement and maintain the action?
5. **Legal:** Does the community have the authority to implement the proposed action?
6. **Economic:** Is the action cost-effective?
7. **Environmental:** Does this action affect the environment (land/water/endangered species)?

Based on concerns expressed by community members and a vote taken by THORR, it was decided that projects that would help solve the biggest and most recurring problems in the town should be addressed first. For example, since Hazardville is most likely to be affected by flooding, the first objective identified was to reduce damages to the manufactured home park in the

floodplain. The town has now made it a priority to buy houses that repetitively flood and to demolish them, leaving the land as open space. Mayor McDonald has proposed turning this open space into a greenway that the entire community can use, and would include a bike path and jogging trail running along the Raging River.

Some of the other actions discussed are, by order of priority:

- Establish a wildfire public education and outreach project;
- Elevate structures in the manufactured home park that are not purchased;
- Construct a berm around the manufactured home park to protect units subject to shallowest flooding;
- Reinforce the boardwalk to withstand storm surge damage;
- Eliminate potential fuels for wildfires;
- Retrofit older masonry buildings to withstand earthquakes; and
- Build retaining walls to limit landslides.

These actions are still important, but they have a lower priority than the floodplain property buyouts.



**1** develop mitigation goals and objectives

**2** identify and prioritize mitigation actions

**3** prepare an implementation strategy

**4** document the mitigation planning process

step



# prepare an implementation strategy

## Overview

In this step, the planning team will prepare a strategy for implementing the mitigation actions decided upon in Step 2. The implementation strategy identifies who is responsible for which actions, what funding mechanisms (e.g., grant funds, capital budget, or in-kind donations) and other resources are available or will be pursued, and when the actions are to be completed. It describes the way the community will use its resources to achieve its goals of reducing losses from future hazard events. It also focuses on coordination between the various individuals and agencies involved in the implementation to avoid duplicating or conflicting efforts.

*Bringing the Plan to Life: Implementing the Hazard Mitigation Plan* (FEMA 386-4) provides more information on implementing the hazard mitigation strategy.

## Procedures & Techniques

### Task A. Identify how the mitigation actions will be implemented.

In this task, the planning team will identify the responsible party or parties, funding resources, and a time frame for implementing the actions selected in Step 2. Table 3-1: Preparing an Implementation Strategy, on the following page, summarizes the subtasks involved and the process for obtaining the end results to include in the implementation strategy. The planning team should apply this process to all of the selected actions.

#### 1. Identify parties, define responsibilities, and confirm partners.

The capability assessment will be very helpful in completing this subtask. The planning team should review the list of agencies and organizations identified in the assessment and how they function so that the team can match the appropriate department or agency with the actions called for in the implementation strategy. For example, if your community decided that enacting a more stringent floodplain ordinance is a top priority, and you know that the



#### Now that projects have been identified,

this is a good time to examine partnerships and search for organizations

that could contribute or support the implementation process. (See *Getting Started*, FEMA 386-1, for information on building partnerships.)



#### Funding Your Actions

Some actions, such as developing policies or initiating

public information activities, will require little or no new funds to implement, as these may be integrated into the day-to-day operations of appropriate agencies. Other actions, such as building houses for low-income residents through Habitat for Humanity, may rely on donated time or materials from local individuals, organizations, or businesses. Many of the actions, such as structural retrofits of critical facilities, may involve identifying new sources of funding or programming the expenses into the next capital improvement budget. The planning team may designate one member or create a subcommittee to be responsible for identifying sources of financial and technical assistance.



**Table 3-1: Preparing an Implementation Strategy**

Task A 1		Task A 2		Task A 3
Identify parties and define responsibilities	Confirm partners (technical or financial)	Identify resources (local, state, and federal governments; foundations; business partners; non-profits) to implement the action	List materials needed (equipment, supplies, and vehicles)	Define the time frame for implementing the actions
Process	Process	Process	Process	Process
Define the roles of the lead and support agencies and/or organizations (work with the community manager and agency heads to determine lead and support agencies)	Contact technical and financial partners necessary for implementation	Prepare a budget and consult various resources to identify funding and technical assistance	Develop a list of all materials necessary for implementation	Discuss the time frame for carrying out each action
Result	Result	Result	Result	Result
Identification of lead and support agencies and organizations, and a listing of their roles and responsibilities	Confirmed commitments from agencies and organizations that will perform specific tasks	Development of a budget, broken out by task, to implement the action and a listing of funding and technical assistance sources	A listing of necessary materials that are available and those that must be purchased to implement the action	An agreed upon time frame for carrying out the actions

*Adapted from Integrated Hazard Assessment for the Island of Puerto Rico, Final Report, 2002*

Environmental Protection Department is listed as administering this ordinance, then you would list this department as the lead agency.

It is also important to review the capability assessment findings to better understand the administrative process necessary to see an action through to completion. For example, after the Environmental Protection Department prepares an amendment to the floodplain ordinance to make it more effective, the city council would be requested to review and adopt the regulations, triggering a public hearing and possibly a public comment period before the council can vote on the amendment. Knowing the process will assist the planning team in developing a more realistic time frame to accomplish the action.

This is a good time for team members to contact or meet with the community manager and lead and support agency heads who will play a role in implementing the actions. This will provide an opportunity to confirm their commitment and cooperation. This is also a good time for these partners to provide input on the steps necessary to carry out the actions, allowing the planning team to fine-





tune the proposed schedules. Department or agency heads should make sure the person(s) responsible for each task under each action has the time and ability to follow through; otherwise, implementation may be delayed.

## ***2. Identify resources to implement the actions.***

Resources include funding, technical assistance, and materials. The team should prepare a preliminary cost estimate or budget, broken out by task, for each of the actions. Knowing the cost will help the planning team target a variety of sources to fund the action. The planning team should also prepare a list of materials (equipment, vehicles, and supplies) that would be required to effectively implement the action. Oftentimes, these items are overlooked. When preparing the list, note which items you have and which you would need to purchase and include these costs in the budget. Additionally, long-term maintenance may be required for projects such as acquisitions. Be certain to factor the necessary maintenance funding into cost estimates and assign responsibility for the maintenance to the proper party. The team will probably need to seek help in preparing these budgets. To back up these estimates, the team should work with the agency or organization that will be responsible for the action.

The planning team should look at the state and local capability assessments to identify resources to implement the identified mitigation actions. The team should examine resources from all levels of government, private sector organizations, and universities to explore all possible sources of assistance. More information on resources is presented in *Securing Resources for Mitigation Planning* (FEMA 386-9).

- a. **Local and state governments** are granted the authority under their police power to protect the health, safety, and welfare of citizens. This includes enacting and enforcing building codes and zoning ordinances, and developing public education programs to alert residents to risks and how they can reduce hazard losses. If the local government is the party responsible for enacting one or more of the mitigation actions, it will need to earmark resources for implementing these actions. A primary funding source for state and local emergency management activities is the Emergency Management Performance Grant. This annual grant is provided by FEMA.
- b. **Sources of local revenue** often used to fund emergency management activities include general taxes, property taxes, exac-



tions, connection fees, impact fees (usually paid by private developers), and special assessment districts. An example of a special fee is a stormwater management fee used to maintain streams, culverts, and other flood control systems. In some cases, local governments use the proceeds to acquire structures in the floodplain.

The planning team should take appropriate action to ensure that funding for mitigation projects is incorporated into state or local budgets. These include:

- **Capital improvement budgets** can incorporate mitigation costs into capital improvement project budgets (e.g., including costs to retrofit a municipal building to current seismic or high wind standards). A key goal of the mitigation planning process is for mitigation to be considered in all capital improvement projects vulnerable to hazards or located within hazard areas.
- **Operating budgets** of specific departments such as public works, planning, building, or environment can include costs for consultants, supplies, and salaries to complete mitigation actions.
- **Special funds** can be established to deal with post-disaster funding needs. Many states have initiated “rainy day funds” to help provide the local match required for most federal grant programs.
- **Staff time** can be very cost-beneficial to use in hazard mitigation projects. Most planning, policy, and regulatory actions require only staff time and political commitment. Staff time can be used as an in-kind match to most federal grants. In a post-disaster setting, employees can coordinate projects and volunteers, assist in the clean-up effort, or help with other activities that can reduce losses and business interruption. It is critical to obtain city or county manager support for mitigation early on in order to have departments commit to significant staff time.

Year-end money may become available toward the end of the municipal, state, or federal fiscal year. To capitalize on this situation, the planning team should:

- **Make priority projects known** to the appropriate local, state, or federal agencies. Regional or district offices of federal



agencies are usually responsible for maintaining an understanding of local needs. If state and federal representatives have been included in the planning process all along, your jurisdiction may be well positioned to hear about these opportunities and successfully apply for funding.

- Assign a team member to **track information** on new federal, state, and regional grant programs.
- Examine how a **project could be broken into parts or phases** that could be quickly completed when funding becomes available.

In addition to funding, the planning team should keep in mind that states have experts available to assist local jurisdictions. Many of these experts were probably consulted when the team profiled the hazards during Phase 2 of the planning process. Most states have one or more of the following staff and/or technical capabilities:

- State Hazard Mitigation Officer
- State Geologist
- State Floodplain Manager
- State Climatologist
- State Forester
- Geographic Information System Specialist

c. **The federal government** is a good source of many grant programs and technical assistance for mitigation. In addition to FEMA, which is the lead federal agency in providing pre-and post disaster mitigation assistance to states, tribes, and communities, several other key departments or agencies are involved in mitigation assistance. These include the U.S. Department of Agriculture for watershed planning, the Department of Housing and Urban Development and its Community Development Block Grant program (CDBG), and the Small Business Administration with pre- and post-disaster loans. Keep in mind, however, that most FEMA funding is distributed by states to the local level. Having an approved mitigation plan in place is required in most cases to receive these federal funds. The library in Appendix B contains more information on federal resources. Following is a sampling of relevant Web sites:



## Relevant Web Sites

<b>Army Corps of Engineers</b>	<a href="http://www.usace.army.mil/">http://www.usace.army.mil/</a>
<b>Department of Agriculture</b>	<a href="http://www.usda.gov/da/disaster/nda.htm">http://www.usda.gov/da/disaster/nda.htm</a>
<b>Dept of Agriculture, Natural Resources Conservation Service</b>	<a href="http://www.nrcs.usda.gov/RID/RID.html">http://www.nrcs.usda.gov/RID/RID.html</a>
<b>Department of Housing and Urban Development</b>	<a href="http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/driquickfacts.cfm">http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/driquickfacts.cfm</a>
<b>Department of Transportation</b>	<a href="http://www.fhwa.dot.gov/programadmin/erelief.html">http://www.fhwa.dot.gov/programadmin/erelief.html</a>
<b>FEMA Flood Mitigation Assistance Program</b>	<a href="http://www.fema.gov/fima/mtap/shtm">http://www.fema.gov/fima/mtap/shtm</a>
<b>FEMA Hazard Mitigation Grant Program</b>	<a href="http://www.fema.gov/fima/hmgrp/">http://www.fema.gov/fima/hmgrp/</a>
<b>FEMA Individual Assistance Program</b>	<a href="http://www.fema.gov/rrr/inassist.shtm">http://www.fema.gov/rrr/inassist.shtm</a>
<b>FEMA National Dam Safety Program</b>	<a href="http://www.fema.gov/fima/damsafe">http://www.fema.gov/fima/damsafe</a>
<b>FEMA National Earthquake Program</b>	<a href="http://www.fema.gov/hazards/earthquakes/">http://www.fema.gov/hazards/earthquakes/</a>
<b>FEMA National Flood Insurance Program</b>	<a href="http://www.fema.gov/nfip">http://www.fema.gov/nfip</a>
<b>FEMA National Hurricane Program</b>	<a href="http://www.fema.gov/hazards/hurricanes/">http://www.fema.gov/hazards/hurricanes/</a>
<b>FEMA Pre-Disaster Mitigation Program</b>	<a href="http://www.fema.gov/fima/pdm.shtm">http://www.fema.gov/fima/pdm.shtm</a>
<b>FEMA Public Assistance Program</b>	<a href="http://www.fema.gov/rrr/pa">http://www.fema.gov/rrr/pa</a>
<b>Small Business Administration</b>	<a href="http://www.sba.gov/disaster">http://www.sba.gov/disaster</a>

### Home- or business-owners carrying flood insurance

auto-matically have Increased Cost of Compliance (ICC) coverage. ICC provides benefits for bringing buildings up to code if they have been substantially damaged. This is important information to have when costs for retrofitting structures after a flood are estimated.



### Benefits of the Hazard Mitigation Plan

After November 1, 2004, only communities, tribes, and states with a FEMA-approved mitigation plan will become eligible to receive mitigation funds following a presidentially declared disaster. Having an approved plan in place will be required in order to receive HMGP funds. Furthermore, after November 1, 2003, plans will be required in order to receive funding for “brick and mortar” projects under FEMA’s Pre-Disaster Mitigation Program.



d. **Private sector organizations and businesses** have a lot to gain by engaging in activities to reduce risks in the community. Businesses and other private interests may be willing to contribute time, labor, materials, space, and other support as part of their commitment to community improvement.

The planning team should also consider securing private grant funds that are available for environmental and natural resource protection, and for sustainable community development and redevelopment. The link between hazard mitigation and sustainability may not be as clear to some private funding sources and they may not list mitigation goals in their requests for proposals. In this case, the planning team may decide to submit a grant application to fund that portion of the project that most closely matches the sustainability grant requirements. See *Planning for a Sustainable Future* (FEMA 364) for more information on the links between sustainability and mitigation.

e. **Academic Institutions** can provide valuable resources in the form of technical expertise and low-cost staff (students), meeting facilities, the latest data related to your state or community, and training resources for planning and related tools such as HAZUS.





## Private Sector Funding at Work

### **Tulsa Child Care Center Retrofit, Tulsa County, Oklahoma**

In June 2000, the City of Tulsa, its insurance committee led by State Farm Insurance, and Sunglow, Inc. conducted a Tulsa area childcare center retrofit, a non-structural approach to making buildings stronger during storms and tornadoes. Crosstown Learning Center, located in the Second Presbyterian Church in Tulsa, was retrofitted by covering all windows with impact-resistant film to prevent shattering during tornadoes (the labor was supplied by Sunglow, Inc. and protective film by Madico); two vending machines were anchored to the wall; and plastic sleeves were added to fluorescent light bulbs to prevent injuries from shattered bulbs. The City of Tulsa also helped the childcare center obtain a programmable weather radio to warn caregivers of severe storms approaching Tulsa County and assisted in the designation of the basement as a safe place during emergencies.

### **Miami-Dade County Residential Shuttering Program, Miami-Dade County, Florida**

The Miami-Dade County Residential Shuttering Program offers free hurricane shutters and installation to elderly low-income residents who qualify for the program. Applications are entered into a database maintained by the American Red Cross Miami and the Keys Chapter, with assistance from Friend, Inc., a coalition of local religious organizations. Eligible applicants are then placed into a lottery and chosen randomly. The program's goal is to shutter approximately 1,300 homes in eligible areas.

If residents cannot put up the shutters themselves, they can apply for this assistance from Friend, Inc. and the Miami-Dade County Community Emergency Response Team (CERT).

### **“FireFree! Get In the Zone” Program, Deschutes County, Oregon**

In an effort to address wildfire danger in the Bend, Oregon, area, four local agencies and a Fortune 500 corporation joined together in 1997 to create “FireFree! Get in the Zone,” a public education campaign designed to reduce the risk of damage by wildfires in Deschutes County and beyond. The campaign aims to educate the public about wildfire safety and promote behaviors and attitudes that translate into creating defensible space around homes and businesses. Initiated by SAFECO Corporation, the partnership originally included the Bend Fire Department, Deschutes County Fire Agencies, City of Bend Development Services, and The Deschutes National Forest. The Oregon Department of Forestry, Deschutes County, and a number of local government organizations and private businesses joined the program shortly thereafter. The campaign uses a combination of mass media advertising, public relations efforts, and educational materials, and engages in cooperative programs with other local organizations.

### **IBM Global Crisis Response Team Preparedness Assessments for Businesses, City of Sparks, Nevada**

In 2000, on-site preparedness assessments were conducted on more than 40 businesses through a partnership between the City of Sparks, Nevada, and disaster specialists from the IBM Global Crisis Response Team. Business owners were given a Disaster Readiness Questionnaire to help them take notes for making improvements, correcting exposures, or implementing recommendations made during the on-site walk-through portion of the assessment. The evaluations covered mitigation issues, such as non-structural earthquake bracing, storage practices, utility shut-offs, data storage backups, the impact of business interruptions, and how to obtain and properly use sandbags to protect against flooding. The on-site business reviews provided practical recommendations on how to protect businesses from the adverse effects of disasters, such as floods, earthquakes, and fires, and provided tips on how to minimize downtime after a disaster. Businesses were also given information on the National Flood Insurance Program, what to do in the event of a disaster, and a suggested list of on-hand supplies to include in their Corporate Office Survival Kits.

**For projects or activities with longer time frames,**

it would be advantageous to establish milestones or benchmarks, so that incremental progress can be monitored and interim successes documented.



**3. Define the time frame for implementing the actions.**

The planning team and responsible agencies should develop a specific time frame for implementing each mitigation action that your community has decided to pursue. Determining the time frame with staff members from the departments or agencies that are responsible for the mitigation action will greatly enhance the chance of your mitigation plan succeeding. The time frame should detail when the action will be started, when interim steps will be completed, and when the action should be fully implemented.

When identifying start dates, keep in mind any special scheduling needs, such as seasonal climate conditions, funding cycles, agency work plans, and budgets. Funding cycles will affect when you can begin implementing an action.

After you have identified the start dates, you may want to review the priority you initially gave to the actions to ensure that you address the issues in that order, whenever possible. If the order of priorities has changed, the planning team should make sure to document the reasons why. Once implementation begins, the planning team should periodically revisit the plan and actions to make sure they fit the changing needs of your community. These issues are discussed in more detail in *Bringing the Plan to Life* (FEMA 386-4).



**Example Implementation Strategy Format**

**Action:** (From your list of selected actions)

**Goal(s) and Objective(s) Addressed:** (Sometimes the action will address more than one goal and objective)

**Lead Agency:** (Provide the name and a brief description of the agency)

**Support Agency or Agencies:** (Provide the name and a brief description of each support agency)

**Budget:** (Provide the dollar amount or an estimate, if known; put TBD—to be determined, if not known; and/or indicate staff time if staff will be used)

**Funding Source(s):** (List the funding sources—e.g., operating budget, capital improvement budget, XYZ grant, XYZ foundation, etc.)

**Start and End Date:** (Indicate start and end dates; short-term, long-term, or ongoing; and milestones for longer term projects)

**Task B. Document the implementation strategy.**

After completing the process summarized in Table 3-1 for each action, you are now ready to document your results. Determine the format for presenting your implementation strategy. This, along with discussions of goals and objectives, and identification and prioritization of actions, will comprise your overall mitigation strategy.

There are many ways to present the implementation strategy. A format that the planning team can use is listed in the adjacent sidebar. If an action is currently being implemented, indicate it as ongoing under the time frame and indicate an end date, when applicable. Be sure to indicate long-term maintenance activities as ongoing. If you choose short-term and long-term time frames, make sure you define, at the beginning of the implementation strategy, the time period you consider to be short and long term (e.g., short-term actions are usually considered to be those that can be accomplished within one year of plan adoption).







## Planning for Post-Disaster Recovery and Reconstruction

Although no community wants to be faced with the daunting task of disaster recovery, the fact remains that many disasters are followed by the largest infusion of federal and state development capital that most communities will ever see at one time. Communities that have paid careful attention to hazard mitigation actions that could be implemented in that “Window of Opportunity” following a disaster, can quickly articulate their needs to state and federal officials. Time is a compelling factor in determining local recovery decisions and outcomes. By addressing these issues before a disaster strikes, communities can rally around a recovery strategy that considers long-term sustainable development objectives rather than rebuilding back to pre-disaster conditions. These communities will have a competitive edge when post-disaster funding and technical assistance become available.

Communities are encouraged to incorporate a post-disaster recovery component into the overall implementation strategy by addressing a set of priorities and policies that will help guide the recovery and reconstruction process. At a minimum, communities should consider a set of hazard mitigation actions that may not be economically or politically feasible in the near term but may become a realistic opportunity following a disaster event. These “on the shelf” mitigation actions could be evaluated against the actual disaster damages and, if appropriate, incorporated into a recovery strategy following a disaster event. Some communities, such as Hilton Head, South Carolina, are expanding this concept by developing a pre-event plan and establishing a recovery organization. This is an emerging area of disaster management practice that crosses over into city planning, redevelopment, and urban design. The recovery organization builds upon the existing framework of local government and often includes a Recovery Task Force with representation from the public and private sectors. The pre-event plan describes the policies, plans, implementation actions, and designated responsibilities related to a rapid and orderly post-disaster recovery process that would be activated following a natural disaster. The recovery organization differs from immediate emergency response functions in that they extend over a much longer period of time, involve a broader range of local land development powers, and operate in a parallel fashion to traditional emergency response activities.

Adopting a recovery and reconstruction ordinance may not be an appropriate course of action for many communities, particularly those located in less hazard-prone regions of the nation. However, considering policies that would efficiently and wisely guide post-disaster reconstruction in the implementation strategy would be a wise investment of resources for any community developing a hazard mitigation plan. The FEMA booklet *Planning for a Sustainable Future* (Publication 364) and the FEMA/APA *Planning for Post-Disaster Recovery and Reconstruction* (FEMA 421) provide additional information on this topic. Both publications can be ordered through the FEMA publications warehouse at 1-800-480-2520.

### **Task C. Obtain the consensus of the planning team.**

The planning team should review the resulting strategy and come to a consensus on the timing of the mitigation actions and on the agencies or other parties responsible. When the team confirms that the timeline and use of resources are realistic, and the appropriate agencies or individuals are designated the appropriate responsibilities, it confirms that the strategy is headed in the right direction.



Before finalizing the strategy, the team should take another look at all of the mitigation actions to ensure that the projects, taken together, reflect the goals, objectives, and priorities of the community and the team. It would also ensure that the timelines of the actions show project completions spanning from a short time after plan adoption through longer time frames. A consensus on the implementation strategy, followed by the adoption of the plan, has the essential ingredients of a functional plan that can truly help a community mitigate its losses from hazards.

## Summary

The implementation strategy you completed in this step will serve as the roadmap for making your state, tribe, or community more disaster resistant. The strategy clearly lays out who will be responsible for undertaking the identified actions, what funding sources are available, and the time frame for completing these actions. You and the planning team now have all the essential elements for your plan and are ready to complete Step 4: Document the Mitigation Planning Process.

# The Hazardville Post

Vol. CXII No. 332

Thursday, November 28, 2002

## The Implementation Strategy

(Part 3 of a 4-Part Series on the Mitigation Strategy Process)

[Hazardville, EM] Planning Department Director Joe Norris, lead planner of the Town of Hazardville Organization for Risk Reduction (THORR), reported that the implementation strategy for the first draft of the Hazardville Hazard Mitigation Plan was complete and available for public review. Council Members, Town Department Heads, and community members have 30 days to submit their comments to Norris. THORR developed the implementation strategy with the help of all of the Town of Hazardville Department Heads. At the direction of the Town Manager, each Department Head has agreed to allow a portion of staff time to be used to help secure funding and eventually monitor the mitigation actions. Below is an excerpt of the implementation strategy. A complete copy of the draft plan is available at the Hazardville Library.

The State Office of Planning and the Office of Emergency Prepared-

ness helped THORR by providing guidance on coordinating the planning process and providing feedback on the development of mitigation strategies. The state also provided THORR with information on the types of mitigation projects likely to receive outside funding and how to look for existing sources of funding not typically used for hazard mitigation or emergency management activities. THORR found that the Hazardville Housing Acquisition Fund, normally used to purchase and demolish substandard housing, could be used for purchasing flood-prone houses. The relationship was beneficial to both parties—THORR received invaluable feedback and assistance, and the state helped one of its local communities protect itself from hazards.

When asked about the next step for Hazardville, Norris replied, “Now that the draft implementation strategy is complete, we have identified where our biggest losses

would be and have agreed on what we should do about them. It is time to roll up our sleeves, get to work, and put our money where our mouth is. We still have a very important document to write, which will show how we developed this plan and the process we went through to help protect Hazardville from future hazards.”

THORR completed the Hazardville Risk Assessment last November and has applied for grants to undertake its most important mitigation project, the purchase and demolition of houses in the floodplain. “Mitigation is the only hope for Hazardville to remain a viable, sustainable community long into the future. I am dedicated to ensuring that Hazardville and its citizens are safe from the effects of future hazards,” vowed Mayor McDonald.

**Action:** Acquire and demolish five houses identified as repetitive loss structures located in the floodplain.

**Goal(s) and Objective(s) Addressed:**

Goal 1: Minimize losses to existing and future structures within hazard areas.

Objective 1.1: Reduce damages to the manufactured home park in the floodplain.

**Lead Agency:** Department of Planning: Responsible for land-use planning, permitting, and economic development.

**Support Agency:** Department of Housing: Responsible for increasing and improving the housing stock, managing the Section 8 Program, and demolishing dilapidated or unsafe residential structures.

**Budget:** \$30,000 per house

**Funding Source(s):** Hazardville Housing Acquisition Fund (yearly appropriation and grants)

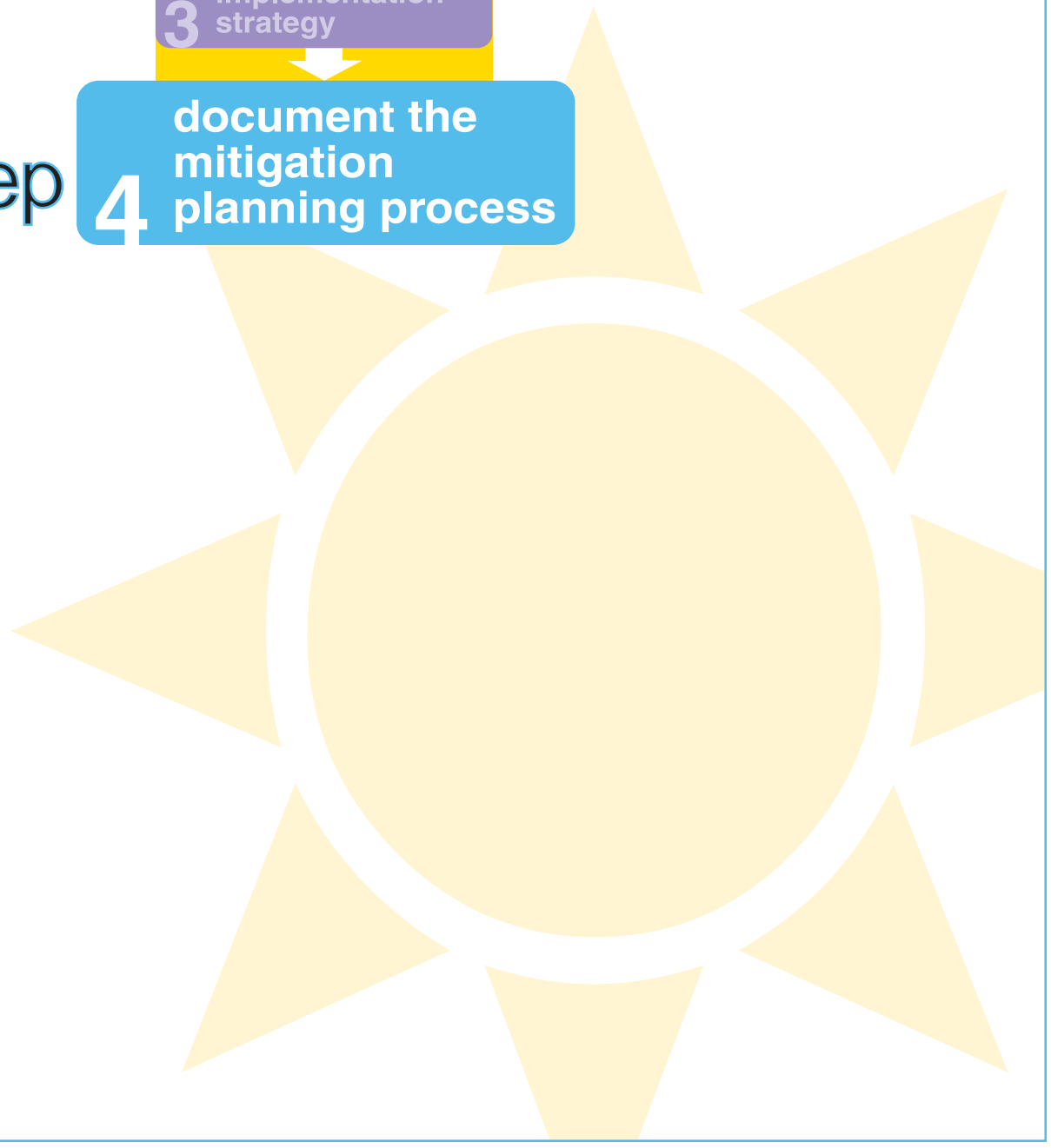
**Start and End Date:** July 2003 – August 2006

**1** develop mitigation goals and objectives

**2** identify and prioritize mitigation actions

**3** prepare an implementation strategy

**step 4** document the mitigation planning process



# document the mitigation planning process

## Overview

One of the most important reasons for having a hazard mitigation plan is to help the community make decisions that will reduce its vulnerability to hazards. Activities that local governments do every day, such as issuing building permits, approving development plans, and repairing roads and bridges, should reflect the community's mitigation vision and goals, whether it's using the most up to date building code, restricting growth in hazard-prone areas, or making infrastructure decisions based on the latest risk assessment findings. The hazard mitigation plan is a guide to keep you on track and serves as documentation of the thoughts and considerations that were the foundation of the planning process. As community leadership changes, and during intense decision-making situations (such as the post-disaster setting and when undertaking major land development decisions), the plan will serve as the representation of the community's principles for hazard loss reduction.

When it is time to put pen to paper, communities and states just initiating or beginning to upgrade existing mitigation plans will not necessarily have the ability to complete all the details of the planning process because of a lack of resources. In these cases, consideration and approval of the plans may be based on the level of documentation provided by the jurisdictions. For example, a community may not be able to complete a risk assessment for all parts of the community, but it may have dealt with the most populated areas first. Documenting in the plan the decision made to undertake this approach is just as important as providing a proposed schedule for completing the risk assessment.

Writing the mitigation plan document should have already begun in the previous steps of the planning process. Now it is time to finalize the plan.



**Review existing mitigation plans,** such as those from other communities or from your state, for ideas on how to structure your plan.



## Procedures & Techniques

### Task A. Make decisions about the style of the document.

#### 1. *Decide how to make the document readable.*

a. **Length.** Sometimes the length of the document can be intimidating to readers. There is no “one size fits all” for state or local mitigation plans. Generally, the plan should be long enough to address all of the required elements in the DMA 2000 regulations; however, it should still be functional and easy to read.

b. **Format/Sections.** There is no required plan format under DMA 2000 regulations. However, the information required in the regulations lends itself to organizing the plan in the following manner: planning process, risk assessment, mitigation strategy, and plan maintenance. Detailed technical information should be contained in appendices, along with detailed maps or financial information.

c. **Language level.** The language of the plan should not be overly technical or complex, nor overly simplified.

#### 2. *Determine how detailed the planning document should be.*

Determine how much information should be included in the planning document, and if there is any information that should be included in an appendix. For example, should the entire risk assessment be included in the main text of the mitigation plan, or should it be referenced as an attachment or appendix? A detailed risk assessment is usually put in an appendix to ensure that the mitigation plan is easy to follow and review; a description of the approach and summary findings, however, should be included in the text.

#### 3. *Establish the schedule for writing the plan.*

A schedule for completing your planning process was set earlier in the process. Your schedule should allow time for drafting and reviewing the plan. The planning team, affected or interested agencies, the public, the state, and FEMA regional staff should review the plan before it goes to your local governing body for approval. If you have not done so already, assemble a list of agencies to receive the draft plan. You should also schedule a public forum to give the public a chance to comment on the plan.

**The state may wish to suggest** a common format and style for all of its community plans.



**For multi-jurisdictional plans,** DMA 2000 criteria require that hazard and vulnerability data and projects unique to each jurisdiction be included in the plan [44CFR §201.6(c)(3)]. Refer to *Multi-Jurisdictional Approaches to Mitigation Planning* (FEMA 386-8) for more information on multi-jurisdictional plans.





Keep in mind that DMA 2000 requires state plans to be updated every three years and local plans every five years.

#### **4. Determine who should write the plan.**

You probably identified someone early in the planning process to write the plan. This person is not necessarily the same person who recorded the meetings. The person selected, however, should be someone who has been involved from the beginning. Possibilities include someone on the planning team, a consultant, intern, or agency staff. Keep in mind that this person has to have good writing and editing skills. If more than one person writes different sections, it is recommended that one person be responsible for final editing.

### **Task B. Write the plan.**

#### **1. Assemble information and write-ups from previous phases of the process.**

This includes:

- Meeting notes that document the planning process;
- Risk assessment and capability assessment findings and results;
- Your mitigation strategy; and
- Other existing plans, models, and state and program requirements to provide an organizational framework.

#### **2. Write the plan in conformance with FEMA program requirements.**

By using this how-to series, you are undertaking a planning process that conforms to several FEMA mitigation programs. FEMA's DMA 2000 requirements are written to fulfill the mitigation planning elements of all FEMA programs; however, refer to program guidance for the specific program to which you are applying, as reflected in Table 1: Hazard Mitigation Planning Process – Local Planning Requirements by Program (found in the Introduction section), for suggestions on how to organize your plan.

To meet DMA 2000 requirements, the plan should include:

##### **a. Description of the planning process [44CFR §201.6(c)(1)].**

This section outlines the process you used to create the plan, as well as a definition of the planning area. Identify who was involved in the process, how they were involved, and the methods of public participation that were employed, as well as a detailed description of the decision-making and prioritization processes.



#### **The hazard mitigation plan should be:**

**Complete.** Does it list all of the action steps to be implemented in all relevant parts of the community? Does it document all the activities of the state, tribe, or community?

**Clear.** Is it apparent who will do what by when? Are there easily identifiable inter-relationships between the loss estimation, problem statements, goals and objectives, the capability assessment, and the list of actions?

**Current.** Does the plan reflect the current work that is being accomplished? Does it anticipate newly emerging opportunities or challenges such as pending state legislation?

**DMA**

#### **The DMA 2000 State and Local Plan Interim Criteria (G-318)**

guidance document explains what a mitigation plan should include to meet DMA 2000 requirements. The CD ROM can be ordered through the FEMA publications warehouse at 1-800-480-2520.



## FEMA is currently developing a guide

on how to use HAZUS to meet DMA 2000 risk assessment requirements.

This guide will be based in part on the results of pilot risk assessments being completed in Warren County, Kentucky; Marion County, Indiana; Austin, Texas; the state of Wyoming; Scottsdale, Arizona; and Portland, Oregon.

HAZUS

## Although maps are not required

as part of the hazard profiles, it is a good idea to include them in the plan. Graphics help the reader visualize the geographic relationships between the loss estimation and the mitigation activity chosen. Note that the Community Rating System requires a floodplain map to obtain credits under this program.

DMA

## See *Bringing the Plan to Life*

(FEMA 386-4) for more information on how to adopt the plan and monitor its progress.



b. **Risk assessment** [44CFR §201.6(c)(2)]. Include your analysis of the hazards and risks facing your community, tribe, or state, including a discussion of your community's hazards and hazard history. Summarize the key elements of the risk assessment in the plan. You can use the hazard profile, maps, and loss estimation summary chart, or you can refer to your risk assessment included as an appendix (See *Understanding Your Risks*, FEMA 386-2, for more details.)

c. **Mitigation strategy** [44CFR §201.6(c)(3)]. Describe how the community and/or state intends to reduce losses identified in the risk assessment, including:

- Goals and objectives to guide the selection of activities to mitigate and reduce potential losses;
- A discussion of pre- and post-disaster hazard management policies and programs to mitigate hazards, including a capability assessment;
- Identification of mitigation actions that were considered in both pre- and post-disaster environments;
- A prioritized list of cost-effective, environmentally sound, and technically feasible mitigation actions; and
- Current and potential sources of federal, state, tribal, local, or private funding and other resources to implement the mitigation actions.

d. **A plan maintenance process section** [44CFR §201.6(c)(4)].

This section describes how you plan to:

- Monitor, evaluate, and update the mitigation plan;
- Incorporate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans; and
- Review progress on achieving goals and activities identified in the mitigation strategy.





**Now that you are organized** and have all the appropriate information, you can begin writing the plan. Here are a few things to keep in mind:

- Technical jargon should be avoided whenever possible. The plan should clearly and effectively communicate risks and hazards to all community members, including laypersons.
- Include definitions of all technical terms. People writing the plan are probably familiar with such terms as *retrofitting*, *flood-proofing*, and *special use overlay district*, but most people are not. Make sure a definition is included, either in the text or a glossary.
- Avoid the use of acronyms. While *HMGP* and *NFIP* make sense to mitigation planners, most people do not know what they mean. Sometimes, the use of acronyms is unavoidable, but make sure the term is explained the first time it is used in the document. Acronyms can also be included in a glossary.
- Technical or lengthy analyses should be included as appendices. Such information is good to include as background or as justification for certain parts of the plan, but it should not be included in the text portion of the document.

## Task C. Review the plan.

### 1. *Planning Team Review.*

The planning team should have an opportunity to review the plan and provide comments.

### 2. *Agency Review.*

Agencies involved in plan implementation should receive a draft copy for review.

### 3. *Public Review.*

Whether a public forum to review the plan is held following the receipt of agency comments, or concurrently as agencies review the draft, the public should have an opportunity to review the draft plan before it is presented for formal adoption. Provide a draft copy to your State Hazard Mitigation Officer (SHMO) for review prior to formal local adoption to see if the plan meets state and federal requirements. FEMA mitigation staff should review the document prior to formal local adoption to ensure that the governing body is acting on a document that meets federal requirements.

### Give the plan to someone who has not been involved



in the planning process to review. If it is clear to that reviewer, you are well on your way to having an understandable draft.



### Under the Community Rating System,

a public meeting must be held at least two weeks before the plan is voted on by the governing board, and the meeting must be properly publicized.



## Communities should check with their State Hazard Mitigation Officer



(SHMO) to determine the state's requirements for reviewing the plan. The SHMO must review the draft plan to get feedback on how well the plan addresses program requirements. The plan should meet all DMA 2000 requirements before it is presented to the local governing body for adoption. If the governing board has to approve multiple versions of the plan, it will probably lose some of its credibility.

## States should check with their FEMA Regional Office



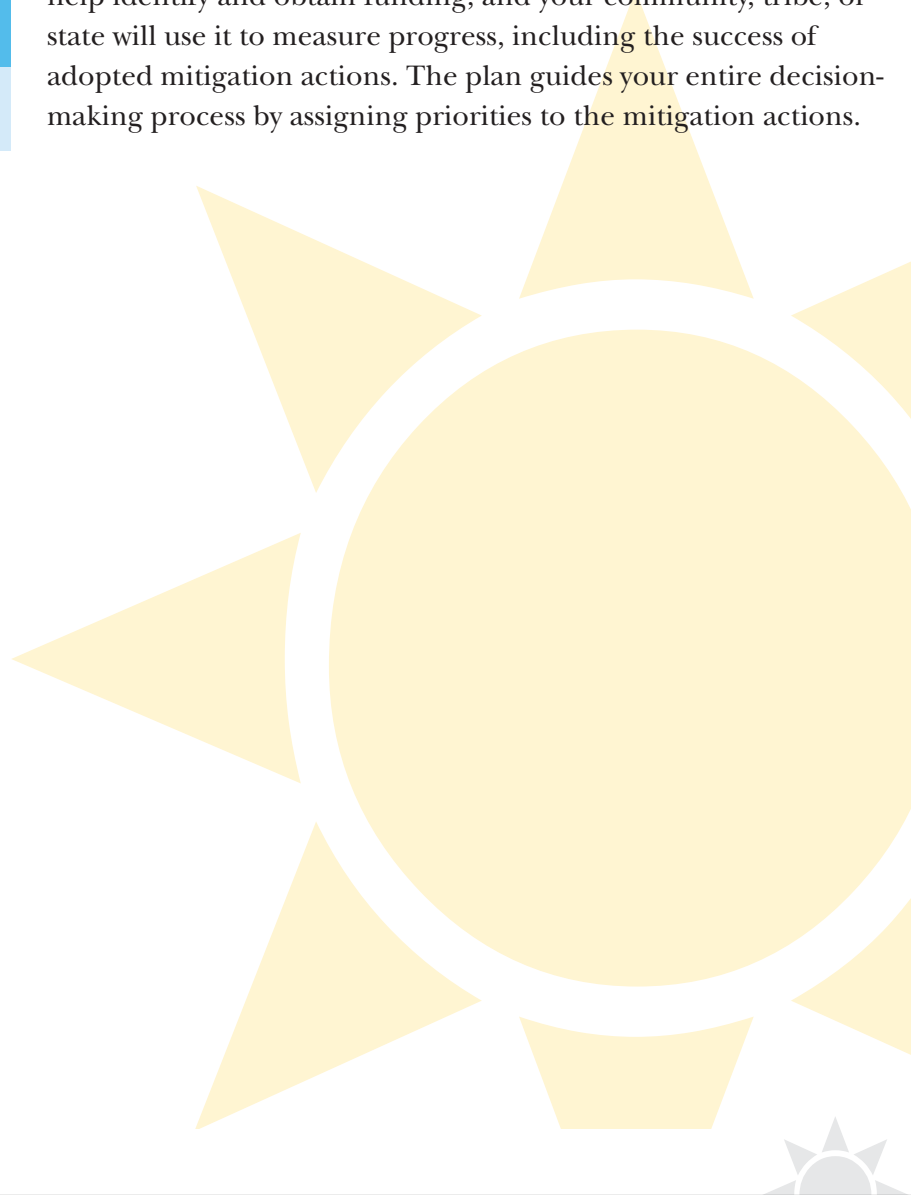
to determine the procedures established for reviewing draft plans.

### 4. Final Draft.

After comments have been received, revise the plan and prepare a final draft. Once comments from all relevant parties have been incorporated, you are ready for the next step: Presenting the plan to your local government body for adoption. This step is covered in a subsequent guide, *Bringing the Plan to Life* (FEMA 386-4).

## Summary

The mitigation plan document is the culmination of everything you have gathered and produced up to this point, but it is also your key to implementing the policies and projects that have been identified. It is a record of the process you used to develop your goals, objectives, and mitigation actions. The plan is a tool to be used to help identify and obtain funding, and your community, tribe, or state will use it to measure progress, including the success of adopted mitigation actions. The plan guides your entire decision-making process by assigning priorities to the mitigation actions.



# The Hazardville Post

Vol. CXIII No. 16

Thursday, January 16, 2003

## The Hazardville Mitigation Plan

(Part 4 of a 4-Part Series on the Mitigation Strategy Process)

**[Hazardville, EM]** The members of the Town Council were presented with a draft copy of the Hazardville Hazard Mitigation Plan at last night's public meeting. According to Planning Department Director Joe Norris, lead planner of the Town of Hazardville Organization for Risk Reduction (THORR), the feedback received from the Town Department Heads and community members was very helpful, and he confirmed that all of the comments would be taken into consideration in the final draft version of the plan. "Overall," Norris stated, "the comments we've received have been positive and supportive, indicating our plan is in line with the community's needs and interests. We plan to incorporate the citizen

feedback we received last night to ensure that we haven't missed the boat on any issue that is important to our community."

Norris said, "The mitigation plan was written by a graduate student intern from the Emergency State University's Planning Department, with oversight and assistance from all of the THORR members." In order to document the planning process, the student attended THORR meetings and took notes on the process, discussions, and decisions of the group. Norris pointed out to the Town Council that the plan itself is very straightforward, with many of the details presented in separate appendices. "We wanted this plan to be easy to read and to understand so we organized it clearly and in-

cluded an annotated outline in the introduction." Norris added that THORR would submit a draft plan to the State Hazard Mitigation Officer and the FEMA Regional Office for review to ensure all requirements have been properly addressed under the Disaster Mitigation Act of 2000, prior to submitting the final plan for approval.

According to Norris, the final plan and overall strategy will be presented to the Town Council for approval on February 13, 2003, and will then be forwarded to the State for final review. The State will review the final plan and send it to the FEMA Regional Office for approval.





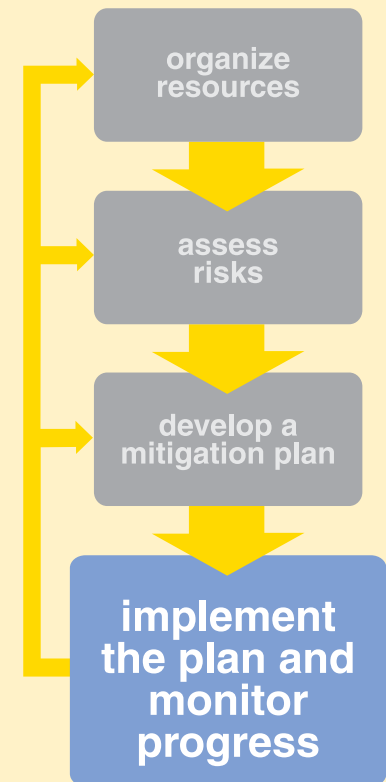
afterword



## You have a mitigation plan. Now what?

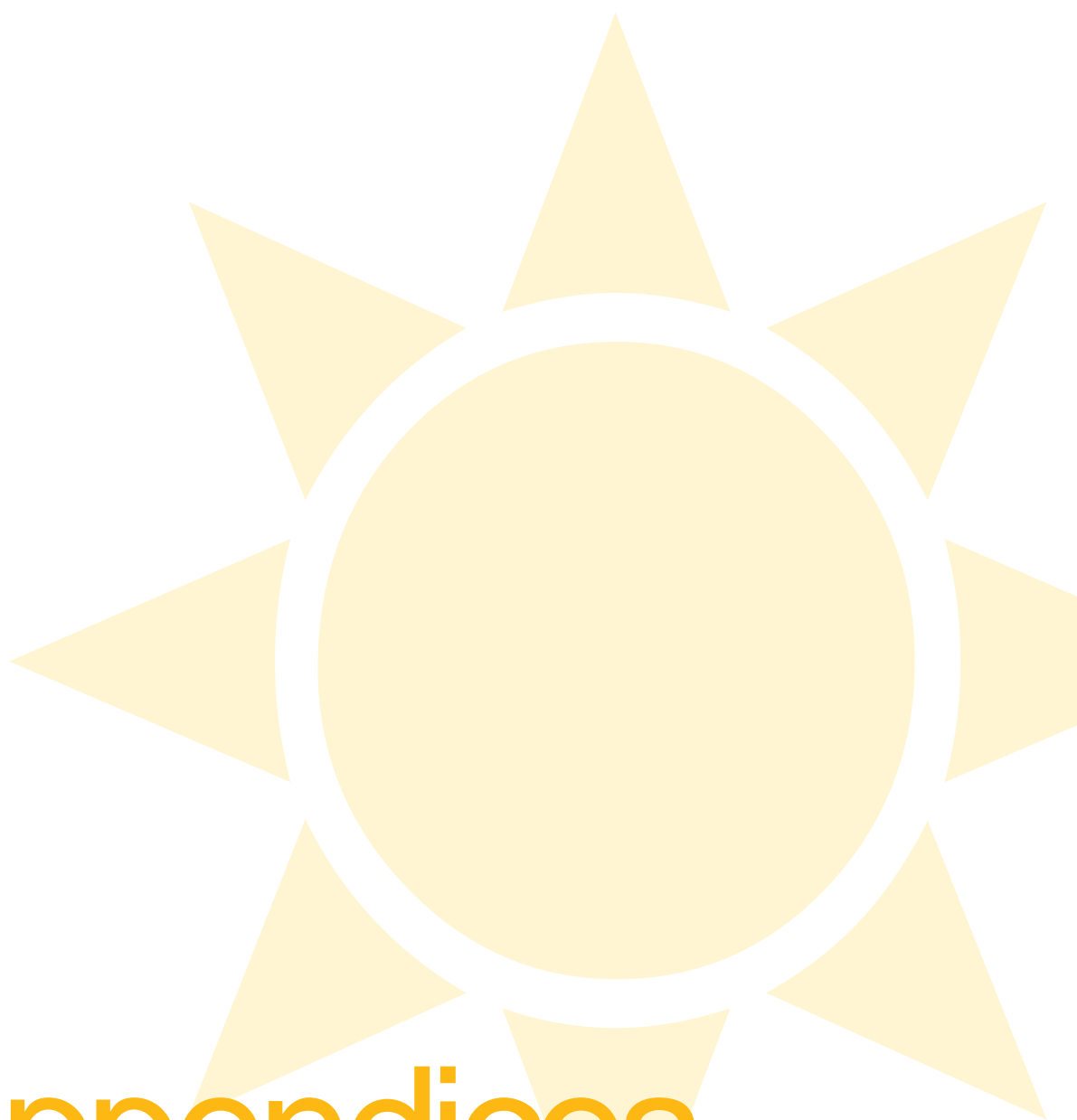
A common failure of some mitigation plans is that they are never implemented. Therefore, in the next phase of the mitigation planning process you will learn how to present the mitigation plan to your governing authority for adoption, formally authorizing the responsible bodies to implement the plan. DMA 2000 requires adoption of the plan by the local government to be eligible for consideration of approval by FEMA. Additionally, multi-jurisdictional plans must be adopted by all of the communities included in the plan in order for each jurisdiction to be eligible. Refer to *Multi-Jurisdictional Approaches to Mitigation Planning* (FEMA 386-8) for more information. If you followed the suggestions in this guide and kept everyone informed of your progress, and you solicited public input and addressed all of your important hazard related goals, your community should be well positioned for the final phase of the planning process—Implement the Plan and Monitor Progress.

**As detailed in the Foreword,** the hazard mitigation planning process consists of four basic phases.



The next how-to in the series, *Bringing the Plan to Life*, will assist you in maintaining an up-to-date, relevant plan.

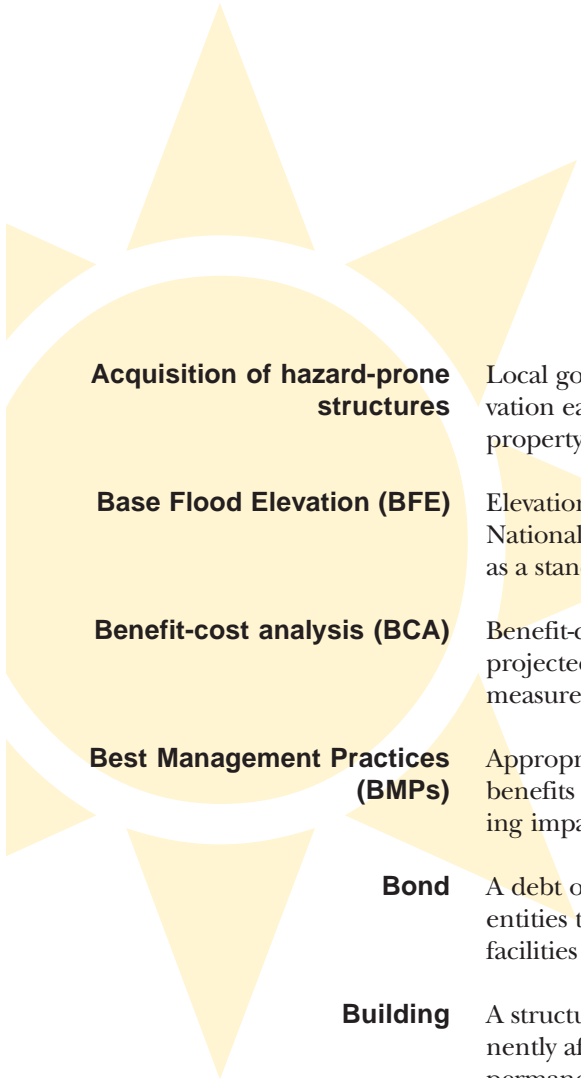




appendices

# appendix a

## glossary



**Acquisition of hazard-prone structures**

Local governments can acquire lands in high hazard areas through conservation easements, purchase of development rights, or outright purchase of property.

**Base Flood Elevation (BFE)**

Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum of 1929. The Base Flood Elevation is used as a standard for the National Flood Insurance Program.

**Benefit-cost analysis (BCA)**

Benefit-cost analysis is a systematic, quantitative method of comparing the projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

**Best Management Practices (BMPs)**

Appropriate, site-specific management techniques that maximize the benefits of land and natural resource management actions, while minimizing impacts.

**Bond**

A debt obligation issued by states, cities, counties, and other governmental entities to raise money to pay for public projects, such as government facilities and infrastructure.

**Building**

A structure that is walled and roofed, principally above ground and permanently affixed to a site. The term includes a manufactured home on a permanent foundation on which the wheel and axles carry no weight.

**Building codes**

Regulations that set forth standards and requirements for the construction, maintenance, operation, occupancy, use, or appearance of buildings, premises, and dwelling units. Building codes can include standards for structures to withstand natural hazards.

**Capability assessment**

An assessment that provides an inventory and analysis of a community or state's current capacity to address the threats associated with hazards. The capability assessment attempts to identify and evaluate existing policies, regulations, programs, and practices that positively or negatively affect the community or state's vulnerability to hazards or specific threats.

**Channel maintenance**

Ensuring that flood channels, storm sewers, retaining ponds, etc. do not become blocked by debris, sedimentation, overgrowth, or structural failure.

**Coastal zone**

The area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas with direct drainage to the ocean.



<b>Coastal zone management regulations</b>	Regulations enacted to control growth and protect natural resources along coastlines. Under the federal Coastal Zone Management Act (CZMA) enacted in 1972, states and local governments adopt coastal zone management regulations designed to preserve, protect, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the wildlife dependent on those habitats.
<b>Community Rating System (CRS)</b>	CRS is a program that provides incentives for National Flood Insurance Program communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of the policyholders in those communities are reduced.
<b>Comprehensive plan</b>	A document, also known as a "general plan," covering the entire geographic area of a community and expressing community goals and objectives. The plan lays out the vision, policies, and strategies for the future of the community, including all of the physical elements that will determine the community's future development. This plan can discuss the community's desired physical development, desired rate and quantity of growth, community character, transportation services, location of growth, and siting of public facilities and transportation. In most states, the comprehensive plan has no authority in and of itself, but serves as a guide for community decision-making.
<b>Construction of barriers around structures</b>	Protective structures, such as berms and retaining walls, created by grading or filling areas with soil meant to keep flood waters from reaching buildings.
<b>Critical facilities</b>	Facilities vital to the health, safety, and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.
<b>Dams</b>	Dams are artificial barriers which impound water, wastewater, or any liquid-borne material for the purpose of storage or control of water. For a more detailed definition, see the National Dam Safety Program Act (as amended through P.L. 106-580, December 29, 2000).
<b>Debris</b>	The scattered remains of assets broken or destroyed in a hazard event. Debris caused by a wind or water hazard event can cause additional damage to other assets.
<b>Density controls</b>	Regulations that manage growth by limiting the density of development, often expressed in terms of the number of dwelling units per acre. Density controls allow the community to plan in an orderly way for infrastructure.
<b>Design review standards</b>	Guidelines enacted by local governments requiring new development to meet certain appearance and aesthetic standards and establishing a process by which local officials can examine site plans or structure blueprints to assess compliance with those standards. Design review standards can help ensure new development blends with existing buildings and the landscape or meet other priorities, including hazard loss reduction.
<b>Design standards</b>	A set of guidelines pertaining to the appearance and aesthetics of buildings or improvements that governs construction, alteration, demolition, or relocation of a building or improvement of land.



<b>Disaster Mitigation Act of 2000 (DMA 2000)</b>	DMA 2000 (Public Law 106-390) is the latest legislation to improve the planning process. It was signed into law on October 30, 2000. This new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.
<b>Dune and beach restoration</b>	Actions taken to re-establish dunes and beaches that serve as natural protection against coastal flooding and storm surge. Dune and beach restoration activities consist of replenishing sand, re-planting protective vegetation, controlling or restricting foot and vehicles traffic, and constructing sand traps or wind barriers.
<b>Earthquake</b>	A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.
<b>Easements</b>	Grant a right to use property, or restrict the landowner's right to use the property in a certain way.
<b>Elevation of structures</b>	Raising structures above the base flood elevation to protect structures located in areas prone to flooding.
<b>Emergency response services</b>	The actions of first responders such as firefighters, police, and other emergency services personnel at the scene of a hazard event. The first responders take appropriate action to contain the hazard, protect property, conduct search and rescue operations, provide mass care, and ensure public safety.
<b>Eminent domain</b>	The right of a government to appropriate private property for public use, with adequate compensation to the owner.
<b>Environmental review standards</b>	Guidelines established to ensure new development adheres to certain construction and site design standards to minimize the impact on the environment.
<b>Erosion</b>	Wearing away of the land surface by detachment and movement of soil and rock fragments during a flood or storm over a period of years, through the action of wind, water, or other geologic processes.
<b>Federal Emergency Management Agency (FEMA)</b>	Independent agency created in 1979 to provide a single point of accountability for all federal activities related to disaster mitigation and emergency preparedness, response, and recovery.
<b>Fire-proofing</b>	Actions taken on and around buildings to prevent the spread of fires.
<b>Flood Mitigation Assistance (FMA) Program</b>	A program created as part of the National Flood Insurance Reform Act of 1994. FMA provides funding to assist communities and states in implementing actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other NFIP insurable structures, with a focus on repetitive loss properties.
<b>Floodplain development regulations</b>	Regulations requiring flood insurance and mandating certain design aspects of new or substantially improved structures that lie within regulated flood-prone areas. Current federal regulations through the National Flood Insurance Program require that, at a minimum, new residential buildings in the Special Flood Hazard Area have their lowest floor at or above the base flood elevation.



<b>Floodplain zoning</b>	Zoning regulations that prescribe special uses for and serve to minimize development in floodplain areas.
<b>Flood-proofing</b>	Actions that prevent or minimize future flood damage. Making the areas below the anticipated flood level watertight or intentionally allowing floodwaters to enter the interior to equalize flood pressures are examples of flood proofing.
<b>Forest and vegetation management</b>	The management of forests and vegetation so they are resilient to landslides, high-winds, and other storm-related hazards.
<b>Forest fire fuel reduction</b>	Minimizing fuel loads in forested areas by clearing excess ground cover and thinning diseased or damaged woodland to create healthier forests and to decrease the vulnerability to the devastation of forest fire.
<b>General obligation bond</b>	A bond secured by the taxing and borrowing power of the municipality issuing it.
<b>Goals</b>	General guidelines that explain what you want to achieve. They are usually broad policy statements, long-term in nature.
<b>Hazard</b>	A source of potential danger or adverse condition.
<b>Hazard information center</b>	Information booths, publication kiosks, exhibits, etc. that display information to educate the public about hazards that affect the jurisdiction and hazard mitigation activities people can undertake.
<b>Hazard mitigation</b>	Sustained actions taken to reduce or eliminate long-term risk from hazards and their effects.
<b>Hazard Mitigation Grant Program (HMGP)</b>	Authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation activities to be implemented as a community recovers from a disaster.
<b>Hazard profile</b>	A description of the physical characteristics of hazards and a determination of various descriptors, including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.
<b>Hazard threat recognition</b>	The process of identifying possible hazards and estimating potential consequences.
<b>Hazard warning systems</b>	Systems or equipment such as community sirens and National Oceanic Atmospheric Administration (NOAA) weather radios designed to provide advanced warning of an impending hazard. Warning systems allow communities to take protective actions before a hazard event occurs, including taking cover, finding shelter, or moving furniture, cars, and people out of harm's way.





<b>HAZUS, HAZUS-MH</b>	A GIS-based, nationally standardized, loss estimation tool developed by FEMA. HAZUS-MH is the new multi-hazard version that includes earthquake, wind, hurricane, and flood loss estimate components.
<b>Health and safety maintenance</b>	Sections of emergency response/operations plans that provide for the security of affected areas, including clean up and special precautions for each type of hazard (e.g., draining standing water after a flood, cautioning about aftershocks after an earthquake or successive tsunami waves, etc.).
<b>Hillside development regulations</b>	Site design and engineering techniques prescribed through regulations such as selective grading, drainage improvements, and vegetation clearance to eliminate, minimize, or control development on hillsides, thereby protecting the natural features of hillsides and reducing the likelihood of property damage from landslides.
<b>Levees and floodwalls</b>	Flood barriers constructed of compacted soil or reinforced concrete walls.
<b>Loss estimation</b>	Forecasts of human and economic impacts and property damage from future hazard events, based on current scientific and engineering knowledge.
<b>Mitigation actions</b>	Activities, measures, or projects that help achieve the goals and objectives of a mitigation plan.
<b>National Flood Insurance Program (NFIP)</b>	Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations as indicated in 44 CFR §60.3.
<b>Objectives</b>	Objectives define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific and measurable.
<b>Open space preservation</b>	Preserving undeveloped areas from development through any number of methods, including low-density zoning, open space zoning, easements, or public or private acquisition. Open space preservation is a technique that can be used to prevent flood damage in flood-prone areas, land failures on steep slopes or liquefaction-prone soils, and can enhance the natural and beneficial functions of floodplains.
<b>Ordinance</b>	A term for a law or regulation adopted by a local government.
<b>Performance standards</b>	Standards setting the allowable effects or levels of impact of development. Often used in conjunction with traditional zoning, the standards typically address specific environmental conditions, traffic, or stormwater runoff. Can also be imposed on structures in hazard areas to ensure they withstand the effect of hazards.
<b>Planning team</b>	A group composed of government, private sector, and individuals with a variety of skills and areas of expertise, usually appointed by a city or town manager, or chief elected official. The group finds solutions to community mitigation needs and seeks community acceptance of those solutions.
<b>Policy</b>	A course of action or specific rule of conduct to be followed in achieving goals and objectives.



<b>Post-disaster mitigation</b>	Mitigation actions taken after a disaster has occurred, usually during recovery and reconstruction.
<b>Post-disaster recovery ordinance</b>	An ordinance authorizing certain governmental actions to be taken during the immediate aftermath of a hazard event to expedite implementation of recovery and reconstruction actions identified in a pre-event plan.
<b>Post-disaster recovery planning</b>	The process of planning those steps the jurisdiction will take to implement long-term reconstruction with a primary goal of mitigating its exposure to future hazards. The post-disaster recovery planning process can also involve coordination with other types of plans and agencies, but it is distinct from planning for emergency operations.
<b>Private activity bond</b>	A bond whose interest may or may not be federally taxable. Under the Internal Revenue Code, private activity bonds are described generally as any bond: (1) of which more than 10% of the proceeds is to be used in a trade or business of any person or persons other than a governmental unit, and which is to be directly or indirectly repaid, or secured by revenues from, a private trade or business; and (2) in which an amount exceeding the lesser of 5% or \$5 million of the proceeds is to be used for loans to any person or persons other than a governmental unit. Certain private activity bonds are tax exempt when used to finance private water, wastewater, and multifamily housing projects.
<b>Public education and outreach programs</b>	Any campaign to make the public more aware of hazard mitigation and mitigation programs, including hazard information centers, mailings, public meetings, etc.
<b>Real estate disclosure</b>	Laws requiring the buyer and lender to be notified if a property is located in a hazard-prone area.
<b>Regulation</b>	Most states have granted local jurisdictions broad regulatory powers to enable the enactment and enforcement of ordinances that deal with public health, safety, and welfare. These include building codes, building inspections, zoning, floodplain and subdivision ordinances, and growth management initiatives.
<b>Relocation out of hazard areas</b>	A mitigation technique that features the process of demolishing or moving a building to a new location outside the hazard area.
<b>Reservoirs</b>	Large water storage facilities that can be used to hold water during peak runoff periods for controlled release during off-peak periods.
<b>Resources</b>	Resources include the people, materials, technologies, money, etc., required to implement strategies or processes. The costs of these resources are often included in a budget.
<b>Retrofitting</b>	See definition for structural retrofitting.
<b>Risk</b>	The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

<b>Safe room/shelter</b>	A small interior room constructed above grade and used to provide protection from tornadoes and other severe storm events. Bathrooms and large closets often double as safe rooms.
<b>Seawalls/bulkheads</b>	Vertical coastal walls that are built and designed to protect buildings against shoreline erosion. May also protect against storm surge.
<b>Sediment and erosion control regulations</b>	Regulations that stipulate the amount of sediment and erosion that is acceptable for land undergoing development.
<b>Shoreline setback regulations</b>	Regulations that establish a minimum distance between the existing shoreline and buildable areas.
<b>Special tax bond</b>	A bond secured by the pledge of a specific special tax.
<b>Special use permits</b>	Permits granted by local governments for land uses that have the potential for creating conflicts with uses on adjacent properties.
<b>Stakeholder</b>	Individual or group that will be affected in any way by an action or policy. Stakeholders include businesses, private organizations, and citizens.
<b>State Hazard Mitigation Officer (SHMO)</b>	The representative of state government who is the primary point of contact with FEMA, other state and federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.
<b>Storm water management regulations</b>	Regulations governing the maintenance and improvement of urban storm water systems and the implementation of land treatment actions to minimize the effects of surface water runoff. Land treatment actions include maintenance of vegetative cover, terracing, and slope stabilization.
<b>Strategy</b>	Collection of actions to achieve goals and objectives.
<b>Stream corridor restoration</b>	The restoration of the areas bordering creeks, including the stream bank and vegetation.
<b>Stream dumping regulations</b>	Regulations prohibiting dumping in the community's drainage system, thereby maintaining stream carrying capacities and reducing the possibility of localized flooding.
<b>Structural retrofitting</b>	Modifying existing buildings and infrastructure to protect them from hazards.
<b>Subdivision</b>	The division of a tract of land into two or more lots for sale or development.
<b>Subdivision and development regulations</b>	Regulations and standards governing the division of land for development or sale. Subdivision regulations can control the configuration of parcels, set standards for developer-built infrastructure, and set standards for minimizing runoff, impervious surfaces, and sediment during development. They can be used to minimize exposure of buildings and infrastructure to hazards.



<b>Taxation</b>	Taxes and special assessments can be an important source of revenue for governments to help pay for mitigation activities. The power of taxation can also have a profound impact on the pattern of development in local communities. Special tax districts, for example, can be used to discourage intensive development in hazard-prone areas.
<b>Transfer of development rights (TDR)</b>	A growth management technique through which development rights are transferred from a designated "sending" area to a designated "receiving" area. The sending area is generally prohibited from development and the receiving area is a targeted development area that can be built at a higher density.
<b>Urban forestry and landscape management</b>	Forestry management techniques that promote the conservation of forests and related natural resources in urbanized areas, with a focus on obtaining the highest social, environmental, and economic benefits.
<b>Vulnerability</b>	Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions.
<b>Wetlands development regulations</b>	Regulations designed to preserve and/or minimize the impact of development on wetlands.
<b>Wind-proofing</b>	Modification of design and construction of buildings to withstand wind damage.
<b>Zoning</b>	The division of land within a local jurisdiction by local legislative regulation into zones of allowable types and intensities of land uses.
<b>Zoning or land use map</b>	A map that identifies the various zoning district boundaries and the uses permitted by a zoning ordinance within those boundaries.
<b>Zoning ordinance</b>	Designation of allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.



# appendix b library

## **General Contact Information**

Federal Emergency Management Agency (FEMA)	<a href="http://www.fema.gov">http://www.fema.gov</a> FEMA Headquarters 500 C Street, SW, Washington, D.C. 20472 Phone: 202-646-4600
FEMA Publications Warehouse	800-480-2520
FEMA Mitigation Publications Library	<a href="http://www.fema.gov/library/prepandprev.shtm">http://www.fema.gov/library/prepandprev.shtm</a>

## **Web Sites**

American Planning Association	<a href="http://www.planning.org">http://www.planning.org</a>
Catalog of Federal Domestic Assistance Programs	<a href="http://aspe.os.dhhs.gov/cfda">http://aspe.os.dhhs.gov/cfda</a>
Community Rating System	<a href="http://www.fema.gov/nfip/crs.htm">http://www.fema.gov/nfip/crs.htm</a>
FEMA Individual Assistance Program	<a href="http://www.fema.gov/rrr/inassist.shtm">http://www.fema.gov/rrr/inassist.shtm</a>
FEMA Mitigation Planning	<a href="http://www.fema.gov/fima/planning">http://www.fema.gov/fima/planning</a>
FEMA Public Assistance Program	<a href="http://www.fema.gov/rrr/pa">http://www.fema.gov/rrr/pa</a>
Flood Hazard Mitigation	<a href="http://www.fema.gov/hazards/floods">http://www.fema.gov/hazards/floods</a>
Flood Mitigation Assistance Program	<a href="http://www.fema.gov/fima/mtap.shtm">http://www.fema.gov/fima/mtap.shtm</a>
Habitat for Humanity	<a href="http://www.habitat.org/">http://www.habitat.org/</a>
Hazard Mitigation Grant Program	<a href="http://www.fema.gov/fima/hmgp/">http://www.fema.gov/fima/hmgp/</a>
HAZUS and HAZUS-MH	<a href="http://www.fema.gov/hazus/index.shtm">http://www.fema.gov/hazus/index.shtm</a>
Home Rule and Dillon Rule	<a href="http://www.naco.org/pubs/research/briefs/dillon.cfm">http://www.naco.org/pubs/research/briefs/dillon.cfm</a>
Institute for Business and Home Safety	<a href="http://www.ibhs.org/">http://www.ibhs.org/</a>
Institute for Local Self Government	<a href="http://www.ilsg.org/">http://www.ilsg.org/</a>
Landslide Hazard Mitigation	<a href="http://www.fema.gov/hazards/landslides">http://www.fema.gov/hazards/landslides</a>
Maxwell Campbell Public Affairs Institute: City and County Report Cards	<a href="http://www.governing.com/gpp/2000/gp0intro.htm">http://www.governing.com/gpp/2000/gp0intro.htm</a> and <a href="http://www.governing.com/gpp/2002/gp2intro.htm">http://www.governing.com/gpp/2002/gp2intro.htm</a>

Mitigation Success Stories	<a href="http://www.fema.gov/fima/success.shtm">http://www.fema.gov/fima/success.shtm</a>
Multi-hazard Mapping Initiative	<a href="http://www.hazardmaps.gov">http://www.hazardmaps.gov</a>
National Association of Regional Councils	<a href="http://www.narc.org">http://www.narc.org</a>
National Dam Safety Program	<a href="http://www.fema.gov/fima/damsafe/">http://www.fema.gov/fima/damsafe/</a>
National Earthquake Hazard Reduction Program	<a href="http://www.fema.gov/hazards/earthquakes/eqmit.shtm">http://www.fema.gov/hazards/earthquakes/eqmit.shtm</a>
National Flood Insurance Program	<a href="http://www.fema.gov/nfip">http://www.fema.gov/nfip</a>
National Hurricane Program	<a href="http://www.fema.gov/hazards/hurricanes/nhp.shtm">http://www.fema.gov/hazards/hurricanes/nhp.shtm</a>
National League of Cities	<a href="http://www.nlc.org">http://www.nlc.org</a>
Native eDGE	<a href="http://nativeedge.hud.gov">http://nativeedge.hud.gov</a>
Pre-Disaster Mitigation Program	<a href="http://www.fema.gov/fima/pdm">http://www.fema.gov/fima/pdm</a>
Protecting Your Home	<a href="http://www.fema.gov/hazards/tornadoes/presskit3.shtm">http://www.fema.gov/hazards/tornadoes/presskit3.shtm</a>
Protecting Your Property from Fire: Dealing with Vegetation and Combustible Materials	<a href="http://www.fema.gov/fima/how2001">http://www.fema.gov/fima/how2001</a>
Protecting Your Property from Fire: Roofing	<a href="http://www.fema.gov/fima/how2002.shtm">http://www.fema.gov/fima/how2002.shtm</a>
Protecting Your Property from Wind	<a href="http://www.fema.gov/fima/how2018.shtm">http://www.fema.gov/fima/how2018.shtm</a>
Protecting Yourself from Tornadoes: Safe Rooms	<a href="http://www.fema.gov/mit/saferoom">http://www.fema.gov/mit/saferoom</a>
Small Business Administration	<a href="http://www.sba.gov/disaster">http://www.sba.gov/disaster</a>
The Grantsmanship Center: Community Foundations	<a href="http://www.tgci.com/resources/foundations/searchGeoLoc.asp">http://www.tgci.com/resources/foundations/searchGeoLoc.asp</a>
Tribal Governments: Laws, Legislation, and Related Topics	<a href="http://www.findlaw.com/01topics/21indian/index.html">http://www.findlaw.com/01topics/21indian/index.html</a>
U.S. Army Corps of Engineers	<a href="http://www.usace.army.mil">http://www.usace.army.mil</a>
U.S. Department of Agriculture	<a href="http://www.usda.gov/da/disaster/nda.htm">http://www.usda.gov/da/disaster/nda.htm</a>
U.S. Department of Agriculture, Natural Resources Conservation Service	<a href="http://www.nrcs.usda.gov">http://www.nrcs.usda.gov</a>
U.S. Department of Housing and Urban Development	<a href="http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/driquickfacts.cfm">http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/driquickfacts.cfm</a>
U.S. Department of Transportation	<a href="http://www.fhwa.dot.gov/programadmin/erelief.html">http://www.fhwa.dot.gov/programadmin/erelief.html</a>
U.S. Environmental Protection Agency	<a href="http://www.epa.gov/">http://www.epa.gov/</a>





U.S. State and Local Government Gateway [http://www.firstgov.gov/Government/State\\_Local.shtml](http://www.firstgov.gov/Government/State_Local.shtml)

Wildfire Hazard Mitigation <http://www.fema.gov/hazards/fires>

*NOTE: The World Wide Web is an ever-changing source of information and web addresses and the information they contain can change over time.*

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appendix c  
worksheets

Worksheet #1	Identify Alternative Mitigation Actions
Worksheet #2	State Mitigation Capability Assessment
Worksheet #3	Local Mitigation Capability Assessment
Worksheet #4	Evaluate Alternative Mitigation Actions
Worksheet #5	Prioritized Alternative Mitigation Actions



*Fill in the goal and its corresponding objective developed in Step One. Use a separate worksheet for each objective. Make sure you note the sources of information. Use Worksheet Job Aid #1 in Appendix D as a starting point for identifying potential mitigation actions.*

**Goal:** \_\_\_\_\_

**Objective:** \_\_\_\_\_

Alternative Actions	Sources of Information (Include sources you consulted for future reference and documentation.)	Comments (Note any initial issues you may want to discuss or research further.)

**Have you considered alternative mitigation actions from other mitigation action categories?**

**Check off ones that apply to this objective.**

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Prevention          | <input type="checkbox"/> Public Education and Awareness | <input type="checkbox"/> Emergency Services  |
| <input type="checkbox"/> Property Protection | <input type="checkbox"/> Natural Resource Protection    | <input type="checkbox"/> Structural Projects |

*List the name of the agency and its mission and function in the first column. By identifying the missions and functions, as well as programs, plans, policies, regulations, funding, and other practices administered by agencies, states create an inventory of resources that can be brought to bear on mitigation efforts within the state.*

*List any programs, plans, policies, etc., this agency has in the second column. It is important to include within this column any legal authorities (which will be found within state regulations) that govern how land would be developed within hazard areas. Typically, these types of regulations are found in state codes under emergency management or public safety codes, building and construction codes, or planning codes. You should also take the opportunity to include any resources that this organization has developed for either state or local use as part of each respective program. Include any appropriate legal citations or source references for programs, regulations, policies, etc.*

*If you know a point of contact, list it in the third column.*

*Check off what type of effect the programs, plans, policies, etc., have on loss reduction. States should now evaluate the effects or implications of these activities on efforts to reduce losses within the state (fourth column). This evaluation should address the implications for both the state and local levels. The essential questions to be answered are: Does/would this program/plan/policy etc., support or facilitate mitigation efforts, or does/would it hinder these efforts? How or why? Put these reasons in the Comments column. At this point, you will not yet try to resolve any issues (such as if a particular program or policy could negatively affect proposed mitigation efforts). However, the planning team will carry forward this information as input into the evaluation of specific actions in Task C.*

*Finally, add any other comments you may have about the agency or its activities in the last column.*

Agency Name (Mission/Function)	Programs, Plans, Policies, Regulations, Funding, or Practices	Point of Contact Name, Address, Phone, Email	Effect on Loss Reduction* (✓)			Comments
			Support	Facilitate	Hinder	

**\*Definitions:**

**Support:** Programs, plans, policies, regulations, funding, or practices that help the implementation of mitigation actions.

**Facilitate:** Programs, plans, policies, etc., that make implementing mitigation actions easier.

**Hinder:** Programs, plans, policies, etc., that pose obstacles to implementation of mitigation actions.



**List the name of the agency and its mission in the first column.** By identifying the missions and functions, as well as programs, plans, policies, regulations, funding, and other practices administered by that agency, local and tribal jurisdictions create an inventory of resources that can be brought to bear on mitigation efforts within the community or tribe. Use Worksheet #2: State Mitigation Capability Assessment and Worksheet Job Aid #2 in Appendix D to complete this worksheet.

**List any programs, plans, policies, etc., this agency has in the second column.** It is important to include within this column any legal authorities (which can be found by reviewing the state capability assessment) that govern how land would be developed within hazard areas. Typically, these types of regulations are found in local zoning, building, subdivision, and other special land development codes (such as floodplain management ordinances, hillside ordinances, etc.). You should also take the opportunity to include any resources that this organization has developed for local use as part of each respective program. Include any appropriate legal citations or source references for programs, regulations, policies, etc.

**If you know a point of contact, list it in the third column.**

**Check off whether the programs, plans, policies, etc., have an effect on loss reduction.** Communities and tribes should now evaluate the effects or implications of these activities on efforts to reduce losses within the jurisdiction (fourth column). The essential questions to be answered are: Does/would this program/plan/policy etc., support or facilitate mitigation efforts, or does/would it hinder these efforts? How or why? Put these reasons in the Comments column. At this point, you will not try to resolve any issues (such as if a particular program or policy could negatively affect proposed mitigation efforts), but the planning team will carry this information forward as input into the evaluation of specific actions in Task C.

**Finally, add any other comments you may have about the agency or its activities in the last column.**

Agency Name (Mission/Function)	Programs, Plans, Policies, Regulations, Funding, or Practices	Point of Contact Name, Address, Phone, Email	Effect on Loss Reduction* (✓)			Comments
			Support	Facilitate	Hinder	

**\*Definitions:**

**Support:** Programs, plans, policies, regulations, funding, or practices that help the implementation of mitigation actions.

**Facilitate:** Programs, plans, policies, etc., that make implementing mitigation actions easier.

**Hinder:** Programs, plans, policies, etc., that pose obstacles to implementation of mitigation actions.



<b>Alternative Actions</b>	<b>Comments</b>

*List the Alternative Mitigation Actions, in order of priority. Identify the goal(s) and corresponding objective(s) each action addresses, and note the sources of information for easy reference and any comments or issues to keep in mind when implementing the action.*

<b>Alternative Actions</b> (In Order of Priority)	<b>Goal(s) and Objective(s)</b> (From Worksheet #1)	<b>Source(s) of Information</b> (From Worksheet #1)	<b>Comments</b> (From Worksheets #1 and #4)

# appendix d worksheet job aids

## Worksheet Job Aid #1: Alternative Mitigation Actions by Hazard

You can use this job aid when filling out Worksheet #1. This job aid shows you at a quick glance the type of actions that can address the selected seven hazards. A description of each action is included in the glossary in Appendix A.

Alternative Mitigation Actions	Prevention																
	Building codes	Coastal zone management regulations	Density controls	Design review standards	Easements	Environmental review standards	Floodplain development regulations	Floodplain zoning	Forest fire fuel reduction	Hillside development regulations	Open space preservation	Performance standards	Shoreline setback regulations	Special use permits	Stormwater management regulations	Subdivision and development regulations	Transfer of development rights
Floods	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■
Earthquakes	■		■	■	■	■				■	■	■		■		■	■
Tsunamis	■	■	■	■		■					■	■	■	■		■	■
Tornadoes	■			■		■						■				■	
Coastal Storms	■	■	■	■	■	■	■	■			■	■	■	■		■	■
Landslides	■		■	■	■	■			■	■	■	■	■	■		■	■
Wildfires	■		■	■	■	■			■	■	■	■		■		■	■





Alternative Mitigation Actions	Property Protection					Public Education & Awareness		
	Acquisition of hazard-prone structures	Construction of barriers around structures	Elevation of structures	Relocation out of hazard areas	Structural retrofits (e.g., reinforcement, flood-proofing, storm shutters, bracing, etc.)	Hazard information centers	Public education and outreach programs	Real estate disclosure
Floods	■	■	■	■	■	■	■	■
Earthquakes	■			■	■	■	■	■
Tsunamis	■	■	■	■	■	■	■	■
Tornadoes					■	■	■	■
Coastal Storms	■	■	■	■	■	■	■	■
Landslides	■			■		■	■	■
Wildfires	■			■		■	■	■

Alternative Mitigation Actions	Natural Resource Protection							
	Best Management Practices (BMPs)	Dune and beach restoration	Forest and vegetation management	Sediment and erosion control regulations	Stream corridor restoration	Stream dumping regulations	Urban forestry and landscape management	Wetlands development regulations
Floods	■		■	■	■	■	■	■
Earthquakes	■							
Tsunamis		■		■				
Tornadoes								
Coastal Storms	■	■		■				■
Landslides	■		■	■	■		■	■
Wildfires	■		■				■	■



Alternative Mitigation Actions	Emergency Services						Structural Projects				
	Critical facilities protection	Emergency response services	Hazard threat recognition	Hazard warning systems (community sirens, NOAA weather radio)	Health and safety maintenance	Post-disaster mitigation	Channel maintenance	Dams/reservoirs	Levees and floodwalls	Safe room/shelter	Seawalls/bulkheads
Floods	■	■	■	■	■	■	■	■	■		
Earthquakes	■	■	■	■	■	■					
Tsunamis	■	■	■	■	■	■			■		■
Tornadoes	■	■	■	■	■	■				■	
Coastal Storms	■	■	■	■	■	■	■		■	■	■
Landslides	■	■	■	■	■	■					
Wildfires	■	■	■	■	■	■					



## **Worksheet Job Aid #2: Local Hazard Mitigation Capabilities**

This job aid will assist the planning team in identifying the various capabilities and capacities in your jurisdiction when completing Worksheet #3. Many of the terms below are defined in Appendix A.

Legal authority and administrative, technical, and fiscal capabilities and capacities in states and local jurisdictions vary greatly throughout the country. You should first use the results of your evaluation of state capabilities to identify any financial or technical assistance the state may be able to provide to local jurisdictions for mitigation purposes. Some states have tasked regional planning agencies with supporting local hazard mitigation planning initiatives. Discuss state and local capabilities with your State Hazard Mitigation Officer (SHMO) to identify outside resources that may be able to assist in plan implementation.

### **Section 1: Legal and Regulatory Capability**

The following section encourages the planning team to think about the legal authorities available to your community and/or enabling legislation at the state level affecting all types of planning and land management tools that can support local hazard mitigation planning efforts in your community.

The following planning and land management tools are typically used by states and local and tribal jurisdictions to implement hazard mitigation activities. Which of the following does your jurisdiction have? If the jurisdiction does not have this capability or authority, does another entity/jurisdiction have this authority at a higher level of government (county, parish, or regional political entity), or does the state prohibit the local jurisdictions from having this authority? You should include this information in the second column on Worksheet #3.



Regulatory Tools (ordinances, codes, plans)	Local Authority (Y/N)	Does State Prohibit? (Y/N)	Higher Level Jurisdiction Authority (Y/N)	Comments
a. Building code				
b. Zoning ordinance				
c. Subdivision ordinance or regulations				
d. Special purpose ordinances (floodplain management, stormwater management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)				
e. Growth management ordinances (also called "smart growth" or anti-sprawl programs)				
f. Site plan review requirements				
g. General or comprehensive plan				
h. A capital improvements plan				
i. An economic development plan				
j. An emergency response plan				
k. A post-disaster recovery plan				
l. A post-disaster recovery ordinance				
m. Real estate disclosure requirements				
n. Other				

## Section 2: Administrative and Technical Capacity

The following section encourages the planning team to inventory existing personnel and technical resources that can be used for mitigation planning and implementation of specific mitigation actions. Think about the types of personnel employed by your jurisdiction and the public and private sector resources that may be accessed to implement hazard mitigation activities in your community.

For smaller jurisdictions with limited capacities, no local staff resources may be available for many of the categories noted below. If so, the planning team should identify public resources at the next higher level of government that may be able to provide technical assistance to the community. For example, a small town may be able to turn to county planners or engineers to support its mitigation planning efforts or a regional planning agency may be able to provide assistance. For some hazard mitigation actions, consider federal agencies that provide technical assistance, such as the U.S. Department of Agriculture (USDA) Cooperative Extension Service, which has offices in most counties. The planning team in rural communities must be creative in identifying outside resources to augment limited local capabilities. For larger or more urban jurisdictions, this inventory task may involve targeting specific staff in various departments that have the expertise and may be used to support hazard mitigation initiatives.

You will need this information when completing **Worksheet #4: Evaluate Alternative Mitigation Actions** and when preparing your mitigation strategy in Step 3.



Identify the personnel resources responsible for activities related to hazard mitigation/loss prevention within your jurisdiction. Does your jurisdiction have:

Staff/Personnel Resources	✓	Department/Agency and Position
a. Planner(s) or engineer(s) with knowledge of land development and land management practices		
b. Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure		
c. Planners or engineer(s) with an understanding of natural and/or human-caused hazards		
d. Floodplain manager		
e. Surveyors		
f. Staff with education or expertise to assess the community's vulnerability to hazards		
g. Personnel skilled in GIS and/or HAZUS		
h. Scientists familiar with the hazards of the community		
i. Emergency manager		
j. Grant writers		



### Section 3. Fiscal Capability

Identify whether your jurisdiction has access to or is eligible to use the following financial resources for hazard mitigation. Use this information to fill in the second column on Worksheet #3 and when preparing your mitigation strategy in Step 3.

Financial Resources	Accessible or Eligible to Use (Yes/No/Don't Know)
a. Community Development Block Grants (CDBG)	
b. Capital improvements project funding	
c. Authority to levy taxes for specific purposes	
d. Fees for water, sewer, gas, or electric service	
e. Impact fees for homebuyers or developers for new developments/homes	
f. Incur debt through general obligation bonds	
g. Incur debt through special tax bonds	
h. Incur debt through private activity bonds	
i. Withhold spending in hazard-prone areas	
j. Other	

