

# **UNIT 10:** **DISASTER OPERATIONS AND** **HAZARD MITIGATION**

## **In this unit**

Floodplain managers agree: It's not *if* your community will be flooded.

It's *when*.

Those who have been hit by a flood or other disaster usually regret they were unprepared. Whether it's your house or your community, you can take steps to be ready for the inevitable.

This unit covers three ways to get ready:

- ◆ Develop a disaster operations/recovery plan so you will be ready to respond to a disaster immediately,
- ◆ Prepare and adopt a hazard mitigation plan, and
- ◆ Know the sources of assistance to implement your mitigation plan.

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## **A. DISASTER OPERATIONS**

After a disaster you can expect everyone to want you to respond quickly and efficiently, without regard to other priorities. You will have to take on emergency post-disaster responsibilities, often at the expense of not performing your normal duties.

In addition, you may, yourself, have suffered damage or loss. So, while you are at work helping others, you may not be getting the help you need yourself. Add to this the need to be available at least 12 hours a day, with few trained helpers.

There may be pressure from the public and elected officials to waive normal procedures and regulations in order to help people return to normal as fast as possible. This is sometimes done in spite of the fact that “back to normal” means people and buildings exposed to the type of flooding that may have caused the disaster in the first place.

In short, your residents and businesses are primarily concerned with getting back to normal. Your stress level is high, patience can be low, the environment is unfamiliar, and there is never enough time or money.

To help you prepare for this scenario, it is strongly recommended that your permit office prepare procedures that will ensure full and fair enforcement of your regulations during this time of stress, confusion and controversy.

### **EMERGENCY OPERATIONS**

Remember, the emergency manager is responsible for disaster and emergency response activities, such as evacuation, rescue, sandbagging and coordination with the county, state and federal emergency management agencies. Once the disaster proves to be big enough, the emergency manager will open up the Emergency Operations Center (EOC).

You may have a role during the emergency. The permit office usually is expected to have a representative in the EOC during the disaster. While you work through this unit, you should meet with the emergency manager to review what he or she expects you to do before, during and after the disaster.

At some time you will move from the emergency phase to the recovery phase. That is where this section picks up. You also should review with the emergency manager what your office needs to be doing to help your community recover, and at what point you and your staff are free to pursue the activities covered in this section.

## **BUILDING CONDITION SURVEY**

A building condition survey is conducted to help the permit office manage time and resources most efficiently. The survey determines:

- ◆ If any building is so dangerous that it should not be reentered without a careful inspection.
- ◆ Which buildings will need a building permit before they can be repaired or reoccupied.

When possible, the building condition survey is done in conjunction with the emergency manager's initial damage assessment. If the area affected is relatively small, the survey may be skipped and the permit office can immediately begin inspecting damaged buildings.

### **High water marks**

High water marks are very valuable records. They will help residents relate the last flood to the regulatory protection level. For example, if the flood was estimated to be two feet below the base flood, people can be told that if they were substantially damaged, they will have to elevate their homes at least two feet above the high water marks

High water marks are also important for recording the extent of the flood and adding to the hydrologic record. Someone, usually the community's engineer, should be responsible for obtaining readings from stream gauges and other high water marks as they are reported. Using these high water marks, the engineer should prepare a flood boundary map and estimate a flood recurrence interval.

### **Work maps**

You should have work maps of the floodplain that show buildings, addresses and elevation contour lines. They should be sized for use during the survey. Made in advance of a disaster, they should be on letter or legal size paper for easy use in a vehicle.

Before the survey, you should review the work maps for the affected area(s) and, using the high water mark data, determine which areas are worst hit. This can be done by plotting known flood boundaries or matching high water marks to the elevation contour lines.

Any area where the flood crest was two feet or more above the buildings' adjacent grade should be outlined on the map and designated as the first priority for the building condition survey.

## Conduct

The building condition survey is conducted from outside all buildings, usually from a vehicle. Depending on the severity and duration of flooding, the survey may be conducted concurrently with the emergency manager's initial damage assessment.

On your work maps, code each building with an "A," "B" or "C" for the three categories of building condition:

*A - Apparently safe:* No exterior signs of structural damage. People can be allowed back in, but they will need building permits for repairs.

*B - Building obviously substantially damaged:* The flood swept the building away, it has collapsed or it is missing one or more walls. The building cannot be reoccupied without major structural work.

*C - Could be substantially damaged:* The building may be substantially damaged, but such damage is not obvious. Any building with more than two feet of water over its first floor falls in this category.

When the field work is done, summarize the survey findings and plot them on a master mitigation map. Use color coding, so areas coded B and C—those that are or may be substantially damaged—will stand out.

## Notice to owners

Upon completing the survey, hand-deliver a letter to each property surveyed, including those assessed as apparently safe. Each letter should include the building's address and, where known, the owner's name. A sample letter is in Figure 10-1.

Keep copies in the permit office and start a file on each property designated as "B—Building obviously substantially damaged" or "C—Could be substantially damaged."

With the letter include a copy of the FEMA/Red Cross book, *Repairing Your Flooded Home*. You can get supplies of them from FEMA or the Red Cross.

If too few copies are available, you may reproduce your own and even include your community's name on the cover. FEMA and the Red Cross encourage this, as it will make the book more pertinent to local readers.

Dear [Name]

The permit office conducted a windshield survey of flooded buildings in your neighborhood. A review of your building from the outside indicates that the structure was affected by the recent flood. Here are some things you should know:

1. Repairs to your building require a permit from the City's permit office. Before you remove, alter, or replace any of the following items, you MUST obtain a building permit: the roof, walls, siding, wallboard, plaster, insulation, paneling, cabinets, flooring, electrical system, plumbing, heating, or air conditioning.
2. The permit office will conduct a complimentary inspection of the damage to your building. This inspection will help you identify what needs to be repaired. It will also identify if a permit is needed and if your building could be substantially damaged. There is no cost for this inspection but it must be taken before you begin your repairs or reconstruction. We will contact you when we plan to do the inspection. If you have a preferred time, please call us to arrange an appointment.
3. You may proceed with clean up activities and temporary emergency repairs without a permit. These include:
  - Removing and disposing of damaged contents, carpeting, wallboard, insulation, etc.
  - Hosing, scrubbing, or cleaning floors, walls, ductwork, etc.
  - Covering holes in roofs or walls and covering windows to prevent the weather from inflicting further damage.
  - Removing sagging ceilings, shoring up broken foundations, and other actions to make the building safe to enter.
4. Some day in the future, your area will flood again. There are things you can do during repair and reconstruction to reduce damage from the next flood. Many of these are discussed in the attached book, *Repairing Your Flooded Home*. We'll be glad to talk to you about protecting your property from future flooding. If we receive a disaster declaration, there may be some financial assistance to help pay for making your property safer than it was before. In the meantime, read Step 8 in *Repairing Your Flooded Home* for some ideas.
5. In order to screen out possible opportunists from taking advantage of the current situation, any contracted work must be done by a firm licensed to work in the City. Furthermore, residents are cautioned and warned *not* to sign blank contracts, agree to have work performed without first seeing the contractor's registration card, or allow work or alterations not authorized by the City permit office.

For further information, please contact the permit office at \_\_\_\_\_.

Sincerely,

[Name], Director  
Permit Office

Attachment: Repairing Your Flooded Home

Figure 10-1: Sample letter to flood damaged property owner.  
(Reword for other types of disaster.)

## PERMIT REQUIREMENTS

As soon as possible after the flood, you should contact your state NFIP coordinator and FEMA Regional Office to review reconstruction regulatory requirements and to see if there are any new guidance documents.

### Permit required

A permit is needed for each building that will be repaired by removing, altering or replacing the roof, walls, siding, wallboard, plaster, insulation, paneling, cabinets, flooring, electrical system, plumbing, heating or air conditioning. These repair/reconstruction projects must meet your building code and flood protection ordinance.

The requirement for a permit cannot be waived, although your governing board may opt to waive permit fees. The board may not amend or ignore the NFIP substantial damage requirement.

### Clean up and emergency repairs

You may allow cleanup and temporary emergency repairs to proceed without a permit. These include:

- ◆ Removing and disposing of damaged contents, carpeting, wallboard, insulation, etc.
- ◆ Hosing, scrubbing or cleaning floors, walls, ductwork, etc.
- ◆ Covering holes in roofs or walls and covering windows to prevent weather from inflicting further damage.
- ◆ Making the building safe to enter by removing sagging ceilings, shoring up broken foundations, and other actions.

You may want to identify which buildings may need emergency work and review with the owner the benefits of having professional contractors do some of it.

Structural alterations—such as removing floors or studs, or replacing a furnace—are not allowed without a permit.

Owners of potentially substantially damaged buildings should be advised against making major repairs unless the building presents a safety hazard, because their buildings may be purchased, modified and/or demolished later.

## ENFORCEMENT

You took your first step in enforcing the repair permit requirement when you

delivered the notices to property owners after the building condition survey and started a file on each property.

## Initial inspection

As soon as possible after the notice is delivered, your office should inspect each flooded property to review needed repairs and determine if a permit is needed.

Use a checklist to make the inspection quick and consistent. A sample checklist is shown in Figure 10-2. Give a copy of the completed inspection to the property owner, along with safety, health and repair information.

## Posting

Upon completion of the inspection, you should post the appropriate sign on the front of the building so it is clearly visible from the street. Appropriate colored signs can be obtained in volume from the model code organizations. The ones shown here are from the Building Officials and Code Administrators (BOCA).

BUILDING DEPARTMENT  
**SAFE**  
For Occupancy

Address or Lot No. \_\_\_\_\_ Code Official \_\_\_\_\_  
Date \_\_\_\_\_ Inspector \_\_\_\_\_ Signature \_\_\_\_\_

If the building needs repairs that do not require a permit, post “Safe for Occupancy” and “Approved to Connect” (utilities) signs.

If a permit to make repairs is needed, post the “Habitable—Repairs Necessary” sign.

BUILDING DEPARTMENT  
**KEEP OUT**  
Uninhabitable

CONTACT BUILDING DEPARTMENT BEFORE ENTERING

Address or Lot No. \_\_\_\_\_ Code Official \_\_\_\_\_  
Date \_\_\_\_\_ Inspector \_\_\_\_\_ Signature \_\_\_\_\_

If it is not safe to clean up or work on the building without major structural repairs, post a “Keep Out—Uninhabitable” sign.

Only a representative of the permit office may remove or replace a sign after permits have been issued and repairs are made. The “safe for occupancy” signs may be removed by the owners in accordance with instructions issued by the community (for example, the permit office may want all signs posted until all inspections have been completed).

Property address: _____		Date: _____
Owner: _____		Phone: _____
<p>Check the appropriate column. Column 1 items note that the damage is minor, column 2 items can be expensive to repair, and column 3 items are indicators of substantial damage. Do not count clean up costs or damage to contents (including plug-in appliances) and other items not part of the building's structure (detached structures, fences, sidewalks, swimming pools, etc.).</p>		
1	2	3
<b>General condition</b>		
___		Building appears sound and safe to enter, needs minor work to make habitable
	___	Apparently safe to enter, needs extensive cleaning/repairs
		___ Foundation, floor, wall or ceiling damage such that building not safe to enter
<b>Depth of water</b>		
___		In crawlspace, <2" in unfinished basement, not in building
___		In unfinished basement, only affected contents and utilities
	___	< 3' in finished basement or over first floor
		___ ≥ 3' over first floor or in finished basement
<b>Foundation</b>		
		Type of foundation: ___ Slab ___ Basement/split level ___ Crawlspace
___		No signs of cracks or settling.
	___	Cracks in basement or crawlspace walls
		___ Buckling of slab or basement floor, broken crawlspace or basement wall
<b>Exterior</b>		
		Type of exterior walls: ___ Masonry ___ Wood/aluminum/vinyl siding
___		No signs of cracks or swelling, doors/windows stick but work
	___	Some swelling or warping of walls, doors/windows may need to be replaced
		___ Deck, porch, balcony damaged
		___ Shifting of wall on foundation, wall broken
<b>Floors</b>		
___		Concrete/tile/bare wooden floors: no signs of damage
___		Tile/vinyl/linoleum coming loose, can be cleaned and reglued
	___	Carpeting/vinyl/linoleum soaked, needs to be replaced
		___ Wooden floor or subfloor warped, broken, or needs replacement
<b>Interior</b>		
___		Water did not reach any wallboard, paneling or insulation, doors stick but work
	___	First four feet of wallboard, paneling or insulation must be replaced
		___ All wallboard, paneling or insulation in the lowest floor must be replaced
		___ Doors/molding/built-in bookcases swollen, warped, need to be replaced
		___ Studs/walls broken, shifted
		___ Ceiling sagging/collapsing

Figure 10-2a. Sample checklist for initial inspection of a flooded building

1	2	3	
			<b>Heating &amp; central air conditioning</b>
			Type of system: ___ Forced air ___ Electric baseboard ___ Other: _____
___			Water did not reach any electrical parts, gas jets, or ductwork
	___		Ductwork needs to be disassembled and cleaned or replaced
		___	Gas jets and/or electrical parts need to be cleaned or replaced
		___	Propane/fuel tank needs to be reconnected and/or anchored
			<b>Electrical</b>
___			Water did not reach any outlets, switches, meters, or fuse or breaker boxes
	___		Outlets, switches, breakers, lights or other fixtures need to be replaced
		___	Meter or service box need to be repaired or replaced by a professional
			<b>Plumbing</b>
___			Drains and sewers need to be cleared
___			Sump pump needs to be repaired or replaced
		___	Water heater needs to be replaced <i>[need a permit or licensed plumber?]</i>
		___	Water softener needs to be replaced <i>[need a permit or licensed plumber?]</i>
			<b>Kitchen and bath</b>
___			Kitchen and bath(s) only need to be cleaned up
___			Built-in appliances, ovens, etc. need cleaning by a professional
	___		Built-in appliances, ovens, etc. need to be replaced
		___	Cabinets/counters warped or otherwise need to be replaced
		___	Plumbing fixtures cracked, broken or need to be replaced
___	___	___	Number of checks in each column
			Completed by: _____
<p>If all checks are in column 1, no building permit is needed. If there are any checks in columns 2 or 3, a building permit must be applied for and a repair/reconstruction estimate (prepared and signed by a licensed contractor) must be submitted.</p> <p>Except where professional cleaning is needed, any items checked in columns 1 or 2 can be performed by the owner.</p> <p>A licensed contractor may charge for the repair/reconstruction estimate, especially if the owner intends to do the work.</p> <p>Any item checked in column 3 and any alteration to the electrical or plumbing systems must be performed by a licensed contractor.</p> <p>The owner should read <i>Repairing Your Flooded Home</i>, page 15-29 for clean up and repair guidance and pages 39-41 for mitigation suggestions to incorporate into the repairs.</p> <p>For further information, please contact the Permit Office at _____.</p>			

Figure 10-2b. Sample checklist for initial inspection of a flooded building

## Follow up

Here are some things to help with enforcement:

- ◆ As you develop procedures, check with your utility companies and appropriate community utility departments. Advise them of your enforcement procedures.
- ◆ If not in place, establish a policy that utilities may not turn service back on unless there is an “Approved to Connect” sign posted on the building. This will help greatly in getting people to comply with the regulations after a disaster and prevent accidents.
- ◆ Instruct police and other departments about the permit requirements and ask them to report to you any construction projects under way without posted permit signs.
- ◆ Within a week of issuing the notices to the owners, visit the notified properties to ensure that the owners are abiding by the requirements.
- ◆ Keep a master list or map to track your survey, inspection and permit application findings.

## Flooded buildings

Flooded buildings are harder to inspect than those damaged by other means. Much of the damage is hidden behind walls or under floors, so the owner may not recognize the long term effects of water, moisture and mold.

You should require that the wallboard/plaster and insulation be removed from a flooded building. Once the owner says the framing members are dry, conduct an inspection. Check the cleanliness and moisture content before allowing the walls to be recovered. If the studs are too wet, tell the owner to allow them to dry more before they are covered over.

The best way to measure the level of moisture in wood is with a moisture meter. You can get a moisture meter through woodworking specialty companies. It needs to have a probe that can be stuck into the wood.

If the wood's moisture content exceeds normal levels for your area of the country (usually 10% - 15%), it is too wet to be covered by paint or wallboard. Reinspect it later after it is allowed to dry some more. If the owner is anxious to rebuild, make sure he or she has a copy of *Repairing Your Flooded Home*. Step 4 of that book reviews how to speed up the drying process.

## Contractor quality control

After a disaster, not-so-honest or unqualified contractors offer to help disaster victims, sometimes offering cut rates or special deals. Your community may want to control this by requiring that certain construction and reconstruction work be done by qualified and licensed people.

If you do license contractors, advise property owners of this requirement through the news media. You can also provide handouts on dealing with contractors and what to do in case of a dispute (for some good language, see Pages 41-43 in *Repairing Your Flooded Home*).

If you receive a sufficient number of complaints, you should relieve a contractor of his or her license to do business. You also can report bad contractors to state licensing agencies and/or the consumer protection division of the state attorney general's office.

Your work does not have to be a series of confrontations with contractors. They can be your best ally when telling a property owner why things have to be done a certain way. They also can help encourage property owners to retrofit and take additional steps to protect themselves from the next flood.

You may want to conduct workshops for contractors on flood repairs, mitigation measures, funding opportunities, etc.

## ADMINISTRATION

### Permit forms

If a permit is required, the property owner should be given the forms needed and told what repairs, if any, can proceed before the permit is issued. Keep these forms in the property's file:

- ◆ Notice to the owner (Figure 10-1).
- ◆ Initial inspection checklist (Figure 10-2).
- ◆ Permit application.
- ◆ Repair/reconstruction estimate.
- ◆ Substantial damage worksheets
- ◆ Inspection records.
- ◆ FEMA Elevation or Floodproofing Certificate, if the building is required to be elevated or floodproofed.
- ◆ Certificate of occupancy.

## Public information

Your community should tell residents about the regulatory requirements and the need to carefully clean and rebuild. You should issue news releases and/or distribute materials to advise property owners about:

- ◆ Activities that need a permit.
- ◆ Activities that do not need a permit (The language in Figure 10-1 could form the basis for a news release.)
- ◆ The substantial damage rule.
- ◆ The benefits of Increased Cost of Compliance flood insurance coverage (see Unit 8, Section B).
- ◆ The need for licensed contractors, if required in your community.
- ◆ The information provided in steps 2, 3 and 4 in *Repairing Your Flooded Home*, such as taking pictures for insurance and disaster assistance claims before throwing things away, how to drain a basement without breaking the walls, and health and safety precautions.
- ◆ The need to include property protection measures as part of repairing homes or businesses. People need to recognize that “returning to normal” means returning to a building that is subject to another flood.

## Technical assistance

Many technical issues can arise during post-disaster permit operations, but you have many sources of assistance:

- ◆ Call your state NFIP coordinator and FEMA Regional Office first. If there was a disaster declaration, they may be able to provide technical assistance staff or workshops to clarify things.
- ◆ Check with your state building code agency and the model building code organizations for publications and example forms for post-disaster operations.
- ◆ Ask your local or state health department for site-specific guidance on how to ensure that a building is fit for reoccupancy, well water is drinkable, etc.

Most states’ Cooperative Extension Services have post-disaster materials and can provide advice on technical matters. They are usually located with your land grant university’s agriculture school.

Some communities require that a contractor certify that a building has been properly cleaned. This should be allowed only if the contractor is qualified to do so.

Two organizations certify repair contractors. They can tell you who in your area are certified and what qualifications they have.

International Institute for Cleaning and Restoration Certification (IICRC)

2715 E. Mill Plain Blvd.  
Vancouver, WA 98661  
Phone: 360/693-5675

Association of Specialists in Cleaning and Restoration (ASCR)

10830 Annapolis Junction Road  
Suite 312  
Annapolis Junction, MD 20701  
Phone: 301/604-4411

### **Staff assistance**

If the disaster affected many properties, you likely will need more people to perform survey and inspection work. Staff assistance can come from:

- ◆ A mutual aid agreement with neighboring communities. There may already be some agreements with neighbors on sharing staff from other offices. If you don't have any, work with your emergency manager on procedures and agreement language.
- ◆ Other communities willing to offer help; check with your state NFIP coordinator.
- ◆ The building officials association, which may know of members available to help.

If there was a disaster declaration, check with your emergency manager. You may be able to get temporary hires, with part of the cost reimbursed through disaster assistance.

Disaster assistance may also reimburse your community for inspectors to conduct habitability inspections and to determine if buildings are substantially damaged.

## B. HAZARD MITIGATION

While this course has focused on regulations directed toward new construction in the floodplain, many communities are more concerned about existing flood problems. This section tackles the bigger issue—reducing flood losses and making sure other activities don't make things worse.

Many communities deal with flooding with only one or two activities. Every community in the NFIP regulates new development to make sure things do not get worse. Many communities tackle their local drainage problems with storm sewer or drainage construction projects. Communities in high hazard areas usually have flood warning and evacuation programs.

However, many communities do not realize how many other flood protection activities they could implement. Nor do they know of all the other federal, state, local and private agencies or organizations that can help them with a flood problem.

While flooding cannot always be stopped—and in many cases, should not be prevented—flood hazards can be reduced. As their definitions attest, the words "hazard mitigation" mean taking measures that minimize or reduce the impacts of flooding on human development.

### MITIGATION MEASURES

For the purposes of this course, flood hazard mitigation is defined as all actions that can be taken to reduce property damage and the threat to life and public health from flooding.”

“All” is the critical word. Each community should consider *all* possible measures for mitigating flood hazards, and each community should seek support from as many programs and agencies as possible.

Each mitigation measure is appropriate in different situations. Structural flood control projects can be the most efficient way to protect an existing critical facility or a concentration of damage-prone buildings. But in developing areas, regulations and acquisition make more sense, as they are inexpensive ways to prevent creation of flood problems.

“All actions” is an all-encompassing definition. To make “all actions” more manageable, flood hazard mitigation measures can be categorized under six basic strategies.

## Prevention

Preventive measures are designed to keep the problem from occurring or getting worse. They ensure that future development does not increase flood damage. Preventive measures are usually administered by building, zoning, planning and/or code enforcement offices. They include:

- ◆ Planning and zoning.
- ◆ Open space preservation.
- ◆ Floodplain development regulations.
- ◆ Stormwater management.
- ◆ Drainage system maintenance.
- ◆ Dune and beach maintenance.

## Property protection

Property protection measures are used to modify buildings subject to flood damage rather than to keep floodwaters away. Your community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners.

Many of the measures do not affect a building's appearance or use, making them particularly appropriate for historical sites and landmarks. These measures include:

- ◆ Acquisition.
- ◆ Relocation.
- ◆ Building elevation.
- ◆ Floodproofing.
- ◆ Sewer backup protection.
- ◆ Insurance.

## Natural resource protection

Water quality and natural habitats may be improved, and flood losses reduced, by preserving or restoring natural areas or the natural functions of floodplain and watershed areas.

These activities usually are implemented by environmental or code enforcement agencies. In addition to these measures, zoning or preserving open space also can protect natural resources.

- ◆ Wetland protection
- ◆ Erosion and sediment control
- ◆ “Best management practices” for stormwater runoff

## **Emergency services**

Emergency services measures protect people during and after a flood. Most counties and many cities have emergency management offices to coordinate warning, response and recovery during a disaster. Emergency services measures include:

- ◆ Flood warning.
- ◆ Flood response.
- ◆ Critical facilities protection.
- ◆ Health and safety maintenance.

## **Structural projects**

Structural flood control projects are used to prevent floodwaters from reaching properties. These measures are “structural” because they involve construction of man-made structures to control water flows. There are six common types of projects:

- ◆ Reservoirs.
- ◆ Levees/floodwalls/seawalls.
- ◆ Channel modifications.
- ◆ Enlarging culverts or bridge openings.
- ◆ Diversions.
- ◆ Storm sewers.
- ◆ Beach nourishment.

Structural projects can be very expensive. Their other shortcomings include:

- ◆ Disturbing the land and disrupting natural water flows, often destroying habitats.
- ◆ Requiring regular maintenance, which if neglected can have disastrous consequences.
- ◆ Being built to a flood protection level that larger floods can exceed, causing extensive damage.
- ◆ Creating a false sense of security, as people protected by a project often believe that no flood will ever reach them.

## Public information

Public information activities advise property owners, potential property owners and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of floodplains.

Usually implemented by a public information office, they can include:

- ◆ Map information.
- ◆ Outreach projects.
- ◆ Real estate disclosure.
- ◆ Library.
- ◆ Technical assistance.
- ◆ Environmental education.

## MITIGATION PLANNING

Different departments in a community may implement activities that are not coordinated or that may even conflict with one another. Some examples:

- ◆ The street P habitat.

## Benefits of planning

Floodplain residents and property owners are not always aware of things that are being done to protect them from flooding, nor are they aware of things they can do to protect themselves, or how they can contribute to community efforts. Developing a flood hazard mitigation plan is one of the best ways to correct these shortcomings.

The objective of planning is to produce a program of activities that will best tackle the community's flood problem and meet other community needs. A well-prepared plan will:

- ◆ Ensure that all possible activities are reviewed and implemented so that the most appropriate and efficient solutions are used to address the local flood problem.
- ◆ Link floodplain management policies to specific activities.
- ◆ Ensure that activities are coordinated with each other and with other community goals, objectives and activities, preventing conflicts and reducing the costs of implementing individual activities.
- ◆ Educate residents about the flood hazard, flood loss reduction measures, and the natural and beneficial functions of floodplains.

- ◆ Build public and political support for projects that prevent new flood problems, reduce flood losses and protect the natural and beneficial functions of floodplains.
- ◆ Fulfill planning requirements for state or federal assistance programs.
- ◆ Facilitate implementation of floodplain management activities through an action plan that has specific tasks, staff assignments and deadlines.

A well-prepared plan will guide your community's flood, stormwater and related activities so that they are implemented more economically and in ways more attuned to the needs and objectives of your community and its residents.

A well-prepared plan also will reduce flood losses and improve protection of the floodplain's natural and beneficial functions, to the benefit of both your community and the NFIP.

### **The planning process**

The planning process includes getting input from everyone who has relevant information, everyone who is affected by flooding and everyone who will participate in implementing the plan. It works for all types of plans, such as those for land use plans, capital improvement, neighborhood redevelopment and hazard mitigation.

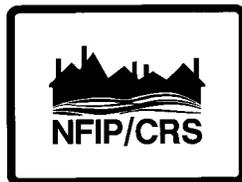
A hazard mitigation plan can take many forms, using a variety of formats and organizational styles. The format and organization of a plan is not what is important.

Dwight D. Eisenhower said, "Plans are worthless. Planning is essential." This simple phrase says it all: The paper document is not as important as the *process* of planning. Because each community is different, each floodplain management plan will be different. However, the process they follow should be similar.

FEMA recommends a 10-step planning process, summarized in Figure 10-3. This process provides a framework with which local officials, residents, engineers, technical experts and others can work out the details and reach agreement on what should be done to mitigate the flood hazard.

1. Organize to prepare the plan.
2. Involve the public.
3. Coordinate with other agencies.
4. Assess the hazard.
5. Assess the problem.
6. Set goals.
7. Review possible activities.
8. Draft an action plan.
9. Adopt the plan.
10. Implement, evaluate and revise.

**Figure 10-3. The 10-step mitigation planning process**



The 10-step planning process is credited under the Community Rating System, Activity 510 Floodplain Management Planning, in the *CRS Coordinator's Manual* and the *CRS Application*. It is explained in more detail in *Example Plans*. Plans developed according to this process are a prerequisite for funding under other FEMA programs (see Section C in this unit).

## **DISASTER MITIGATION ACT OF 2000 PLANNING REQUIREMENTS**

The Disaster Mitigation Act of 2000 modified the Robert T. Stafford Disaster Relief and Emergency Management Act to establish new mitigation planning requirements. The Act continues the requirement for a State Hazard Mitigation Plan as a condition of disaster assistance and provides for States to receive increased Hazard Mitigation Program Grant (HMGP) funding if they have in effect a FEMA-approved Enhanced State Mitigation Plan. More importantly for communities, the Act establishes new local mitigation planning requirements. After November 1, 2004 communities must have a FEMA-approved mitigation plan in place in they want to receive HMGP funding or funding for projects under the new Pre-Disaster Mitigation Program. See the FEMA website or contact you State Emergency Management Agency or FEMA Regional Office for further information on this requirement.

## **MULTI-OBJECTIVE MANAGEMENT**

Because water does not respect property lines or city limits, solutions to your community's flood problem will involve not just people who suffered damage most recently, but also the neighborhood, your community and even the rest of the watershed.

A single-minded approach will not lead to a solution to a flood problem. Other interests are out there, and if everyone focuses only on his or her own concerns, everyone will simply compete—and no one wins.

On the other hand, there is a proven approach to reduce flood losses and simultaneously address other community concerns. Called multi-objective management or M-O-M, it succeeds because using it builds alliances among interest groups.

M-O-M uses existing financial and other resources to look at the whole watershed affecting the flooding problem. In the end, your community will have coordinated flood loss reduction with reaching some of its other goals and needs. By using M-O-M, solutions to flooding will be more effective, more sensitive to the environment, have broader support, be part of a more comprehensive program and accomplish more than one objective.

### **M-O-M guidelines**

There is nothing magical about multi-objective management. The idea is to bring together everyone with a concern or problem that has the potential to affect or be affected by the flood problem. It requires communication among groups, and it capitalizes on the help government agencies and private organizations offer.

Multi-objective management has six guidelines:

**1. Keep the effort locally based.** Solutions must be acceptable to residents, their neighbors and others in the area. They must fit in with other local concerns and goals.

**2. Understand the flood problem and its relation to the watershed.** The problem is not isolated; neither is it limited to one stream or one neighborhood. If people think in terms of the whole watershed, they will come up with more possible solutions—and the solutions will not cause problems for someone else.

**3. Think broadly about possible solutions to reduce the flood problem.** There are more ways to do things than conventional wisdom may suggest. Don't get locked into wanting a floodwall or other single-purpose project without first checking out alternatives.

**4. Identify the other community concerns and goals that could have a bearing on the flood problem.** People who are interested in those other concerns should meet and brainstorm possible solutions that can reach more than one of their objectives.

**5. Obtain expert advice and assistance from government agencies and private organizations.** Planners should find out what financial assistance and advice are available. They should not put all their eggs in one basket and wait for

that big “cure-all” project that may never be funded; there are literally hundreds of programs out there.

**6. Build a partnership among the private and public groups and individuals that can be enlisted to work on the objectives.** More minds and hands mean that better ideas will result, people will be more likely to follow through, and more people will be available to do the work.

Using the systematic 10-step process will help greatly in developing a mitigation plan that coordinates and includes the other community objectives and interests. Preparing a written plan helps keep people get organized, clarifies solutions and formalizes everyone's participation.

## **Benefits**

If you have a flood problem, you may ask, “Why bother with this M-O-M stuff? Why not just stop the flooding?”

This is not as easy as it sounds, especially if you are on a large river.

Structures to “stop” or control floods can be expensive to build and maintain; take a long time to plan, fund, and build; and can cost more than the value of the property they would protect. They may adversely affect other properties, the environment and other people’s plans for the area. As shown by the Great Flood of 1993, they don't always work, especially if a flood is larger than anticipated.

If you have only one objective—“stop the flooding”—you may spend a lot of time and money on your one problem, in the process creating problems for other people. You will be competing with other communities that want funds for expensive structural projects. You will even be competing with others in your community who have different goals in mind.

The M-O-M approach helps you take charge of your future by looking at all the things your community needs and seeing how they can be combined with possible ways to reduce flood losses. Your eggs are not all in one basket, you are less dependent on outside agencies, and you have more sources of funding and technical advice.

With M-O-M, you join forces with other people who are just as devoted to their goals—be they parks and recreation, economic development, tourism or environmental education. You can all reach your objectives in a cheaper, faster and less disruptive manner by using M-O-M, and get more permanent, less expensive flood loss reduction than by trying to control the natural forces that cause floods.

One reason M-O-M gets such good results is that by using it, you treat the river's floodplain and its watershed as a resource. The floodplain need not be just

a place with a flood hazard; it is also an area that is important to your community and to plant and animal life.

The M-O-M process makes sure that flood projects don't undermine other community objectives and the need to protect the natural environment.

For more information on M-O-M, see *Using Multi-Objective Management to Reduce Flood Losses in Your Watershed*.

#### Kampsville, Illinois

Kampsville, Illinois, is a town of 400 residents on the Illinois River. Its residents could have continued to endure flooding, wait for a flood control project that would not be built, or look for alternative ways to reduce flood losses. They chose the third option, and it paid off during the 1993 flood.

After Kampsville was flooded in 1979 and again in 1982, residents and local officials decided to do something. They knew they would not stop the Illinois River from flooding, and that to build a large enough levee would require removing many of the buildings they wanted to protect. So they began a systematic planning process to review alternative ways to reduce flood losses.

One of the first things they did was ask for help. The Illinois Department of Natural Resources provided staff support, and during a series of planning meetings, other agencies were invited to explain their ideas and tell how they could help.

It became apparent that the best solution was to purchase and relocate the worst-hit buildings. Because this would leave the town with a large open area, folks started talking about what they would do with it.

They also were concerned that they would lose some businesses when the floodprone properties were bought out. During this process, they realized that they had to think about more than just flooding; they had to consider the future of their town and its economic base. They expanded their planning process to encompass other goals, including redeveloping the acquired area, designing a park and building a base for tourism.

Taking the plan to various funding sources, Kampsville eventually received more than \$1 million to buy 50 properties and convert flooded and dilapidated buildings to open space. The money was used also to elevate some buildings that were not flooded very deeply, to floodproof the water treatment plant and to relocate the fire station. A new ferry landing and all-weather access into town were also built.

Pursuing its other objectives, the village started sponsoring recreation activities, including an annual celebration that brings in hundreds of people. They now view the riverfront as a resource, not a problem area.

In all, financial assistance was provided by three state agencies, two federal agencies and the town's largest employer. Although it took almost 10 years to plan, fund and complete, Kampsville's approach paid off during the 1993 Midwest flood. The town suffered some damage because floodwaters exceeded the base flood elevation, but Kampsville did not make the news because its damage was relatively minor compared to that of its neighbors.

**Figure 10-4. A M-O-M example**

## C. MITIGATION ASSISTANCE PROGRAMS

A variety of federal, state, local and private sources offer assistance in mitigation activities. Help is limited only by your community's imagination.

This section reviews the more common programs.

### TECHNICAL ASSISTANCE

Help with mitigation planning may be available from a local, regional or state planning agency or a private organization. For example, the National Park Service's Rivers, Trails and Conservation Assistance Program provides staff support for local planning under certain conditions. If they can't help with the whole thing, they may be able to help with some tricky parts, like providing a facilitator for an all-day community input workshop.

Another source of assistance is a private consultant. Planning and engineering firms usually have personnel skilled in the various flood loss reduction measures and the planning process.

These flood-related agencies and organizations may help in providing technical assistance or in implementing mitigation activities that benefit your community:

- ◆ The soil and water conservation district.
- ◆ Agencies of the U.S. Department of Agriculture that work with watershed property owners, such as the Natural Resources Conservation and Cooperative Extension services.
- ◆ Watershed, stormwater management or flood control districts.
- ◆ Regional or metropolitan water, sewer or sanitary districts.
- ◆ The state or county emergency management or civil defense agency.
- ◆ The state natural resources or water resources agency.
- ◆ Local watershed councils or associations.
- ◆ The district office of the U.S. Army Corps of Engineers.

More references and contacts in floodplain management agencies and programs can be obtained through your state NFIP coordinator (see Appendix B), the Association of State Floodplain Managers ((608) 274-0123)) and the Floodplain Management Resource Center ((303) 492-6818)).

An excellent source of information is the *M.O.M. Resource Directory* prepared jointly by FEMA and the National Park Service. A computer program that lists more than 300 government and private programs, the Windows-based software is easy to install and use.

It is available free from:

Rivers, Trails and Conservation Assistance  
National Park Service  
P.O. Box 25287 IMFA-RM-S  
Denver, CO 80225-0287  
Phone: (303) 969-2781  
Fax: 303-987-6676

Assistance on wetlands issues can be obtained by calling the USEPA Wetlands Information Hotline at (800) 832-7828.

## **PROPERTY OWNERS**

Many times, a community does not have to look beyond the beneficiaries of hazard mitigation to find help for a mitigation activity.

For an activity that directly affects a property, such as a retrofitting project, the owner should be asked to chip in. One example is using the owner's insurance claim to help pay for a project related to repairing a damaged building. The Increased Cost of Compliance coverage in the flood insurance policy was specifically created for mitigation purposes. It is discussed in more detail in Unit 8, Section B.

Owners who recognize that they have a real flood problem are willing to pay a large part of the cost. In one project in Denham Springs, Louisiana, homeowners paid up to \$40,000 as the 50/50 match to elevate their homes above flood levels. In the Chicago area, some communities found that a rebate for as little as 20 percent or 25 percent of the total project cost can be a real motivator to get property owners to implement retrofitting projects. Over 400 projects have been implemented with the owners paying the bulk of the cost.

For more information on these and other local funding sources, see the Corps of Engineers' *Local Flood Proofing Programs*.

## **FLOOD MITIGATION ASSISTANCE PROGRAM**

The National Flood Insurance Reform Act of 1994 authorized FEMA to provide grants to states and communities for planning assistance and for mitigation projects that reduce the risk of flood damage to structures covered by flood insurance. The overall goal of the Flood Mitigation Assistance (FMA) program is to fund cost-effective measures that reduce or eliminate the long-term

risk of flood damage to buildings, manufactured homes and other insurable structures.

FMA will pay 75 percent of the cost of these measures under its planning grants, project grants and technical assistance grants. Each state receives annual funding for planning and project grants. States distribute the planning grants at their discretion, in accordance with each grant's limitations. All funding applications must go through the state to be accepted by FEMA.

Technical assistance grants are given to state agencies that provide assistance to communities, so only the other two funding sources are covered here.

### **Planning grants**

The purpose of a planning grant is to develop or update a Flood Mitigation Plan. To be eligible for an FMA project grant, an eligible applicant must develop, and have approved by the FEMA regional director, a Flood Mitigation Plan which “will articulate a comprehensive strategy for implementing technically feasible flood mitigation activities for the area affected by the plan.”

The regulations note that “existing plans, such as those credited through the Community Rating System ... may meet the requirements of FMA with few or no modifications.”

At a minimum, plans must include these elements, all of which are part of the 10-step hazard mitigation planning process that was discussed in the previous section:

- ◆ A description of the planning process and public involvement, which may include workshops, public meetings or public hearings.
- ◆ A description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties and the extent of flood depth and damage potential.
- ◆ The applicant's floodplain management goals for the area covered by the plan.
- ◆ Identification and evaluation of cost-effective and technically feasible mitigation actions that were considered.
- ◆ Presentation of the strategy for reducing flood risks and continued compliance with the NFIP, and procedures for ensuring implementation, reviewing progress and recommending revisions to the plan.
- ◆ Documentation of formal plan adoption by the legal entity submitting the plan.

## Project grants

The following types of projects are eligible for funding through FMA, providing they meet all other eligibility criteria:

- ◆ Acquisition of insured structures and underlying real property in fee simple and easements restricting real property to open space uses.
- ◆ Relocation of insured structures from acquired or restricted real property to nonhazard-prone sites.
- ◆ Demolition and removal of insured structures from acquired or restricted real property.
- ◆ Elevation of insured residential structures in accordance with NFIP standards.
- ◆ Elevation or dry floodproofing of insured nonresidential structures in accordance with NFIP standards.
- ◆ Other activities that bring an insured structure into compliance with the NFIP's floodplain management requirements.
- ◆ Minor physical flood mitigation projects that reduce localized flooding problems and do not duplicate the flood prevention activities of other Federal agencies.
- ◆ Beach nourishment activities.

To be eligible a project grant, a project must be:

- ◆ In conformance with the Flood Mitigation Plan. The type of project being proposed must be identified in the plan.
- ◆ Cost-effective, not costing more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future floods were to occur. Both costs and benefits are computed using net-present value.
- ◆ In conformance with federal regulations on floodplain management, protection of wetlands, seismic safety and applicable environmental laws and regulations.
- ◆ Technically feasible.
- ◆ In conformance with the minimum standards of the NFIP.
- ◆ Located physically in a participating NFIP community that is not on probation or must benefit such community directly by reducing future flood damage.

## PRE-DISASTER MITIGATION PROGRAM

The Pre-Disaster Mitigation (PDM) Program was authorized by Section 203 of the Robert T. Stafford Disaster Assistance and Emergency Relief Act. Beginning in Fiscal Year 2003 Congress appropriated funds for the Pre-Disaster Mitigation Program to fund mitigation plans and projects by States and communities. Currently the program is funded at approximately \$150 million per year. PDM funds are made available to States and communities through a national competition. There is a 75% Federal cost-share. Although funding is available for mitigation plans and projects that address all hazards, it is expected that a significant portion of the funding will be for projects that reduce flood damages. The latest information on how to apply for these funds and on the criteria that will be used to rank projects can be found on FEMA's website at <http://fema.gov/fima/pdm>.

## DISASTER ASSISTANCE

If your community is hit by a disaster and the area subsequently receives a presidential disaster declaration, a variety of programs can provide mitigation assistance. Most of them are authorized by the Robert T. Stafford Disaster Relief and Emergency Act, known as the Stafford Act.

First, a disaster field office will be established under the guidance of a state coordinating officer and a federal coordinating officer. They will be supported by mitigation staff, directed by a deputy federal coordinating officer for mitigation and a state hazard mitigation officer.

Two types of help will be provided: technical assistance and financial assistance. The federal-state team will distribute up-to-date materials about these programs; this section provides a brief overview of them. Note that they may be slightly different when implemented in your area in the future.

### Technical assistance

The disaster assistance staff should be able to spend time with your community's mitigation planners. They can review mitigation measures, techniques and funding sources.

One of their prime concerns will be proper regulation during reconstruction (see Section A of this unit). They can help analyze damage to identify areas prime for acquisition and clearance and help develop mitigation plans.

The disaster team may also provide technical assistance to property owners. Information on repairing and retrofitting is given through public meetings, handouts and news releases. Sometimes mitigation tables are set up in disaster service centers, or separate Reconstruction Information Centers are opened. They house architects, engineers and other specialists who can work closely with

owners to help design appropriate flood protection measures.

## Financial assistance

FEMA will widely publicize the assistance programs that are made available after a disaster declaration. Three main types of assistance are available, each of which can fund mitigation measures:

**1. Public/Infrastructure Assistance**, formerly known as the Public Assistance Program, it can provide 75 percent of the cost of repairing or restoring facilities owned by public agencies and certain private nonprofit organizations. If an applicant prefers to relocate a facility out of the floodplain rather than replace it, FEMA will still provide funds, but at a reduced share.

FEMA takes the first step in obtaining Public/Infrastructure Assistance funding by completing a Damage Survey Report (DSR) for each facility. The community should have a representative on each DSR team to provide local input into the repair or replacement design for damaged facilities.

The local DSR representative should be aware that this program provides an opportunity to incorporate hazard mitigation features while replacing some damaged property. FEMA can provide funding above and beyond the cost of repairing or replacing a public facility, if it can be demonstrated that the proposed mitigation measure is technically feasible, cost-effective and required by a state or local regulation.

*Mitigation Example:* A flood washes out a culvert that used to back up every time there was a 2-inch rain. FEMA and the state will estimate the cost to repair or replace it as it was. If someone points out that (1) a larger culvert can save more money than it costs by reducing flood damage to other properties and (2) floodplain regulations prohibit obstructions in the floodway, then FEMA may share the expense of replacing the lost culvert with a larger one.

Similarly, funds from this program can be used to protect or relocate damaged water and sewer lines, floodproof pumping stations or replace bridges with clear spans.

*Insurance note:* Public/Infrastructure Assistance grants for public buildings are subject to a “deductible.” Under the Stafford Act, Federal disaster assistance for a flooded public building will be reduced by the amount of flood insurance coverage the community should have on that building.

It does not matter whether the building is insured; FEMA will still only provide assistance for damage that exceeded the level of available insurance.

*Example:* The maximum amount of flood insurance available for a non-residential building is \$500,000. Floodville's \$2 million city hall is flooded

and receives \$600,000 in damage. If the city hall is in an SFHA, the disaster assistance program will assume it's insured for \$500,000. Federal aid to repair or rebuild the city hall will be 75% of \$100,000 (\$600,000 - \$500,000).

Floodville will receive \$75,000 in disaster assistance for a building that suffered \$600,000 in damage. If the city hall was not insured, Floodville's taxpayers are going to have to come up with the balance. If it was insured, the city will have \$575,000 (\$500,000 in insurance claim and \$75,000 from disaster assistance) toward repairs and reconstruction.

Flood insurance is also a good idea because not every flood warrants a Federal disaster declaration. The moral of the story is to make sure that all publicly owned buildings subject to flooding have flood insurance.

**2. Human services programs** provide resources to assist residents and business owners, such as temporary housing, unemployment aid, food stamps, grants and loans. Many of these were formerly called the Individual Assistance Program.

Temporary housing can be particularly helpful in providing homes for people waiting to find out if their homes can be reoccupied or if they will be acquired and cleared.

The Individual and Family Grants (IFG) program is designed to help disaster victims pay for "unmet needs," such as those that are not funded by other programs. It is a grant to individuals, usually people who cannot qualify for a loan or cannot get a loan to cover all of their expenses.

Sometimes IFG can be used to fund minor property protection projects, such as elevating a furnace, water heater, washer or electrical service box above the flood level. These grants can be especially useful in areas with lower income or fixed income families that are subject to shallow or basement flooding.

**3. Hazard mitigation programs** provide financial resources to help reduce susceptibility to damage from a future disaster. Section 404 of the Stafford Act makes money available to assist eligible applicants after a Presidential disaster declaration. Section 404's Hazard Mitigation Grant Program will pay up to 75 percent of the cost of such mitigation projects.

To be eligible, the projects should be consistent with the recommendations of the state's mitigation plans and strategies. Projects must be shown to be cost-effective, and they may mitigate hazards other than the one that caused the disaster.

Eligible projects include acquisition of floodprone properties and reversion to open space, elevation of floodprone buildings and minor drainage improvements.

Traditionally, the program has most often been used to acquire floodplain

properties. In some communities, the property owners volunteered to help pay the local share of the cost.

Even if your community did not receive a disaster declaration, you may be able to receive a Hazard Mitigation Grant. In 1997, FEMA ruled that the funds could be spent on appropriate projects throughout a state that received a disaster declaration.

**4. Small Business Administration Disaster Loan Program,** provides loans to disaster victims that meet the ability to repay, income qualifications. In addition to borrowing enough funds to repair damages, the SBA Disaster Loan Program will provide additional loan amounts in order for the repairs to comply with local codes. Also, SBA will allow an additional 15% for incorporating mitigation measures during the repair process.