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# Introduction to Hazard Mitigation

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**Glossary**

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**Test Yourself Answer Key**
Federal Emergency Management Agency Training

The Federal Emergency Management Agency (FEMA) is the central point of contact within the Federal Government for a wide range of emergency management activities. The agency has numerous roles, including coordinating Government activities, providing planning assistance, guiding and advising various agencies, and delivering training.

FEMA’s training program is delivered through the Emergency Management Institute (EMI). EMI provides emergency management training to enhance emergency management practices throughout the United States for the full range of potential emergencies.

A complete listing of EMI courses is available on FEMA’s website. The address is http://www.fema.gov.

Independent Study Courses

The independent study program is one way that EMI offers emergency management training to the general public and to select emergency management audiences.

Go to http://training.fema.gov/emiweb/is/ for information on these courses.

These independent study courses are geared toward both the general public and persons who have local government responsibilities for emergency management. All courses are suitable for either individual or group enrollment, and are available at no charge. Courses include a final examination, and persons who score 75 percent or better on the examination are issued a certificate of completion by EMI.

If you have questions about these courses, you can call 301-447-1200, e-mail independent.study@dhs.gov, or write to:

FEMA Independent Study Program
Administration Office
Emergency Management Institute
16825 S. Seton Avenue
Emmitsburg, MD 21727

For information regarding application for academic credit and fees, contact the Independent Study Office at EMI at 1-800-238-3358.
As the costs of disasters continue to rise, governments and ordinary citizens must find ways to reduce hazard risks to our communities and ourselves. Efforts made to reduce hazard risks are easily made compatible with other community goals; safer communities are more attractive to employers as well as residents. As communities plan for new development and improvements to existing infrastructure, mitigation can and should be an important component of the planning effort. Mitigation means taking action to reduce or eliminate long-term risk from hazards and their effects.

FEMA has produced a series of courses intended to train those who have responsibility for, or simply interest in, reducing hazard risks in their States, communities, or Tribes. This course provides an introduction for those who are new to emergency management and/or hazard mitigation.

Complete this course at a comfortable pace. Upon completing all five lessons, the activities and lesson quizzes, and the final exam, you should be able to:

- Define hazard mitigation and the importance of hazard mitigation in sustainable communities.
- List the main components of each phase of the local hazard mitigation planning process.
- Identify hazard mitigation measures that are applicable to your community’s hazard risk problems.
- Identify resources for projects that reduce hazards.
Introduction

Course Lessons

The course “Introduction to Hazard Mitigation” has five lessons:

**Lesson 1. Hazard Mitigation: Sustainable Futures for At-Risk Communities**
– Explores the reasons and need for planning for a sustainable, disaster-resistant community; describes how hazard mitigation fits into the cycle of emergency management, describes hazard mitigation concepts and practices; explains the relationships between hazard mitigation planning, reducing hazard risk, and sustainable communities; and outlines several Federal initiatives to support hazard mitigation as well as the planning guidance established by the Disaster Mitigation Act of 2000.

**Lesson 2. Gaining Support for Hazard Mitigation**
– Emphasizes the need for a systematic approach to reducing the risk of future disaster damages through mitigation planning; and introduces a systematic planning process, methods for developing community-wide support for mitigating hazard risks, and how to take the first key steps toward a local hazard mitigation program.

**Lesson 3. Assessing Risks**
– Describes and demonstrates a methodology to determine what hazard risks potentially threaten a community and how vulnerable the community is to those risks; and explains how a community uses this risk assessment as the basis for developing hazard mitigation and emergency plans.

**Lesson 4. Building and Implementing a Community Hazard Mitigation Plan**
– Explains how to develop a community hazard mitigation plan; connects the risk assessment to the development of a mitigation strategy; and provides the guidelines for writing and implementing a hazard mitigation plan that meets the needs of the community as well as the plan requirements of the Disaster Mitigation Act of 2000.

**Lesson 5. After a Disaster: Recovery and Hazard Mitigation Programs**
– Describes the role of the Federal, State, and local governments in disaster recovery, and how to identify and utilize post-disaster opportunities to implement planned hazard mitigation actions.
How To Complete the Course

You will remember the material best if you take your time completing the lessons and doing the activities. Throughout the lessons there is white space next to the text where you can make notes.

Each of the five lessons follows a similar format. A summary concludes the end of the descriptive portion of each lesson. Following the summary, each lesson includes an activity called Hazard Mitigation in Your Community. These activities consist of questions regarding hazards, disasters, and mitigation in your own community. Answering these questions will help you relate the course material to your own circumstances to make it more meaningful.

A quiz called Test Yourself follows each lesson and includes 5 to 10 true-false, fill-in-the-blank, or multiple-choice questions. An answer key is provided for each quiz.

Take a break at the end of each lesson to give yourself time to think about it. Then go back and take the quiz at the end of the lesson, reviewing the material if you missed any questions.

A Glossary of hazard mitigation terminology is located after the final lesson.

A list of Mitigation Resources identifies organizations and publications that provide additional hazard mitigation information.

The Final Examination tests knowledge gained from the course. The exam consists of 30 multiple-choice and true-false questions. An answer sheet is supplied with the course materials, along with mailing instructions for having the exam graded and the certificate awarded.
Lesson 1. Hazard Mitigation: Sustainable Futures for At-Risk Communities

Introduction

This lesson explores the reasons for communities to take steps to reduce hazard risks through mitigation. After completing the reading and the activities, you should be able to:

- Explain the trends that have resulted in the dramatic increases in the cost of disaster response, recovery, and rebuilding.
- Describe the relationship between sustainability and disaster-resistant communities.
- Define mitigation as it applies to natural and manmade hazards.
- Explain the intent and major components of Federal hazard mitigation initiatives, including the Disaster Mitigation Act of 2000.
- Describe hazard mitigation successes.

Increased Costs of Disasters

Each year the United States sustains natural and manmade disasters that cost hundreds of lives and average billions of dollars in losses. These disasters are caused by floods, wildfires, winter storms, tornadoes, landslides, earthquakes, hurricanes, and other natural events, as well as intentional and unintentional manmade hazard events. These circumstances demand the attention of government at all levels, the private sector, and individuals, to take steps to decrease hazard risks.

Risk means the estimated impact a hazard event would have on people, services, facilities, and structures in a community, and the likelihood of an occurrence resulting in those conditions.

Over the last several decades, land development has led to sprawling suburban communities and homes, built with minimal attention to protection against high winds, flooding, wildfire, or other natural hazards. More people were, and still are, moving to and building in areas that put them in harm’s way.
Lesson 1. Hazard Mitigation: Sustainable Futures for At-Risk Communities

Sustainability and Disaster-Resistant Communities

According to the World Commission on Environment and Development, sustainable development “meets the needs of the present without compromising the ability of future generations to meet their own needs.”

In sustainable communities, decisions made by the present generation will not reduce the options of future generations. The present generation will pass on a natural, economic, and social environment that will provide a high quality of life. Some U.S. communities, devastated by hurricanes and other hazard events in the first 5 years of the millennium, have demonstrated that developed, populated hazard areas may not be sustainable.

An essential characteristic of sustainable communities is resistance to disasters. A disaster-resistant community is one in which significant steps and actions have been taken to reduce the community’s vulnerability to potential hazard events. When an event does occur, the rewards of these steps and actions include:

- Saved lives.
- Reduced damage to property.
- Reduced economic losses.
- Minimized social disruption.
- Ability of local government to resume operations quickly.
- Shorter recovery period for the community.
- Improved attractiveness to individuals and businesses by demonstrating effectiveness in dealing with a disaster.

Communities pursue disaster resistance through one or both of the following:

- Reducing risk to future development through location (planning), better codes, and implementation and enforcement of codes.
- Taking steps to protect existing development.
Lesson 1. Hazard Mitigation: Sustainable Futures for At-Risk Communities

**Definition of Hazard Mitigation**

These strategies for reducing disaster damage and destruction are commonly known as hazard mitigation. *Hazard mitigation* is defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects.

The purpose of hazard mitigation is twofold:

- To protect people and structures.
- To minimize the costs of disaster response and recovery.

**Hazard Mitigation and Emergency Management**

The many tasks and functions of emergency management may be summarized into a cycle through which communities *prepare* for emergencies and disasters, *respond* to them when they occur, help people and institutions *recover* from them, and *mitigate* their potential effects to reduce the risk of future loss.

**Preparedness** ensures people are ready for a disaster and respond to it effectively. Preparedness requires figuring out what you’ll do if essential services break down, developing a plan for contingencies, and practicing the plan.

**Response** begins as soon as a disaster is detected or threatens. It involves search and rescue, mass care, medical services, access control, and bringing damaged services and systems back on line. When State and local governments are overwhelmed by a disaster, they may seek Federal assistance through a Presidential disaster or emergency declaration. Typically, Federal assistance is financial. However, in catastrophic events, the Federal government may be asked to mobilize resources from any number of Federal agencies, and to participate in the response.

**Recovery**, or rebuilding, after a disaster takes years. Services, infrastructure (utilities, communication, and transportation systems), facilities, operations, and the lives and livelihoods of many thousands of people may be affected by a disaster. Local community and State governments do what they can to bring about the recovery. When those resources are expended, Federal loans and grants can help. Funds are used to rebuild homes, businesses and public facilities, to clear debris and repair roads and bridges, and to restore water, sewer and other essential services.
Viewed broadly, the goal of all hazard mitigation efforts is risk reduction. The emphasis on sustained actions to reduce long-term risk differentiates mitigation from preparedness and response tasks, which are required to survive a disaster safely. Mitigation is an essential component of emergency management. Effective mitigation actions can decrease the impact, the requirements, and the expense of a natural hazard event.

Hazard Mitigation Programs

Hazard mitigation takes many forms. A few examples are effective floodplain management, engineering of buildings and infrastructures to withstand earthquakes, and the implementation of building codes designed to protect property from natural hazards. The Federal government has created several programs intended to help States and communities reduce or eliminate long-term risk from hazards.

National Flood Insurance Program

For decades, the national response to flood disasters was simply to provide disaster relief to flood victims. Efforts also were made to install flood-control constructions such as dams, levees, and seawall.

Funded by tax dollars, this approach failed to reduce the losses. It also did not provide a way to cover the damage costs of all flood victims. To compound the problem, the public generally could not buy flood coverage from insurance companies, because private insurance companies see floods as too costly to insure.

In the face of mounting flood losses and escalating costs of disaster relief to U.S. taxpayers, Congress established the National Flood Insurance Program (NFIP) in 1968. The goals of the program are to reduce future flood damage through floodplain management, and to provide people with flood insurance. More than 35 years later, the NFIP continues to offer flood insurance to homeowners, renters and business owners, provided their communities use the NFIP's strategies for reducing flood risk. Community participation in the NFIP is voluntary, although some states require NFIP partnership as part of their floodplain management programs. NFIP flood insurance is the best protection against the devastating financial losses that floods cause.
Floodplain management

Floodplain management refers to an overall community program of corrective and preventive measures for reducing future flood damage. These measures generally include zoning, subdivision, or building requirements, and special-purpose floodplain ordinances. When a community chooses to join the NFIP, it must adopt and enforce minimum floodplain management standards for participation. FEMA works closely with state and local officials to identify flood hazard areas and flood risks. Floodplain management requirements within Special Flood Hazard Areas (SFHAs) are designed to prevent new development from increasing the flood threat and to protect new and existing buildings from anticipated flood events.

Communities participating in the NFIP must require permits for all development in the SFHA. Permit files must contain documentation to substantiate how buildings were actually constructed. The community also must ensure that construction materials and methods used will minimize future flood damage. In return, the Federal government makes flood insurance available for almost every building and its contents within the community.

Flood Mapping

Flood maps are used to locate a property within a particular flood zone. When considering purchasing or renewing a flood insurance policy, a property owner needs to know whether the property is in a low- to moderate or high-risk area to determine which policy is right for them. Over the years, many of the government's flood insurance maps have become obsolete due to urban growth, changes to river flows and coastlines, and even flood mitigation efforts like drainage systems and levees. Accurate information is essential to inform property owners of emerging flood risks and to determine appropriate rates for flood insurance coverage.

Map Modernization is FEMA’s response to the need to update and maintain flood hazard maps. This initiative is creating digital flood insurance rate maps (DFIRMs) for more than 20,000 communities across the United States. In addition, the DFIRMs will become the platform for identifying other potential risks such as land erosion, deforestation and ice flows.
Hazard Mitigation Programs (Continued)

This five-year effort will transform flood maps into maps that are more accurate, easier-to-use and readily available to consumers. When Map Modernization is complete, you will be able to print and use these maps right from your desktop. FEMA's commitment to this aggressive, multi-year initiative will save the government an estimated $45 billion over the next 50 years.

**Flood Insurance**

Unlike a standard homeowners policy, flood insurance covers losses to property caused by flooding. Some of the things a standard flood policy will cover include:

- structural damage.
- furnace, water heater and air conditioner.
- flood debris clean up floor surfaces such as carpeting and tile.

A flood insurance policy can also cover the contents of a home, such as furniture, collectibles, clothing, jewelry and artwork.

Policies are available in three forms: **Dwelling** (most homes), **General Property** (apartments and businesses), and **Residential Condominium Building Association** (condominiums).

If a property owner has a federally backed mortgage on a home located in a high-risk area, federal law requires the purchase of flood insurance. Also, if a property owner received a federal grant for previous flood losses, they must have a flood policy to qualify for future aid.

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**National Dam Safety Program (NDSP)**

Dams are an integral part of our Nation’s infrastructure, equal in importance to bridges, roads, and airports. There are now more than 10,000 dams in the United States classified as high-hazard potential, meaning that their failure from any means, including a terrorist attack, could result in loss of life, significant property damage, lifeline disruption, and environmental damage.

The Dam Safety and Security Act of 2002, which was signed into law on December 2, 2002, addresses safety and security for dams through the coordination by FEMA of federal programs and initiatives for dams and the transfer of federal best practices in dam security to the states. The Act of 2002 includes resources for the development and maintenance of a national dam safety information network and the development by the National Dam Safety Review Board of a strategic plan that establishes goals, priorities, and target dates to improve the safety and security of dams in the United States.
The Act of 2002 continues all of the programs established by the 1996 Act that have been serving to increase the safety of the Nation’s dams, including grants to the state dam safety programs that regulate over 78,000 dams in the United States; training for state dam safety staff and inspectors; and technical and archival research, including the development of devices for the continued monitoring of the safety of dams.

National Earthquake Hazard Reduction Program

Earthquakes cannot be prevented, but their impacts can be managed to a large degree so that loss of life and property can be reduced. To this end, the National Earthquake Hazards Reduction Program (NEHRP) seeks to mitigate earthquake losses in the United States through both basic and directed research and implementation activities in the fields of earthquake science and engineering. The NEHRP is the Federal Government’s coordinated approach to addressing earthquake risks. Congress established the program in 1977 (Public Law 95-124) as a long-term, nationwide program to reduce the risks to life and property in the United States resulting from earthquakes. The NEHRP is managed as a collaborative effort among the Federal Emergency Management Agency (FEMA), the National Institute of Standards and Technology (NIST), the National Science Foundation (NSF), and the United States Geological Survey (USGS).

The four goals of the NEHRP are to:

- Develop effective practices and policies for earthquake loss-reduction and accelerate their implementation.
- Improve techniques to reduce seismic vulnerability of facilities and systems.
- Improve seismic hazards identification and risk-assessment methods and their use.
- Improve the understanding of earthquakes and their effects.

National Hurricane Program

The National Hurricane Program conducts and supports many projects and activities that help protect communities and their residents from hurricane hazards. Three key components of the Program are Response and Recovery; Planning, Training, and Preparedness; and Mitigation.
Hazard Mitigation Programs (Continued)

Response and Recovery

Helping communities and individuals repair damage, rebuild, and recover after hurricanes and coastal storms. Activities include: providing liaison teams to assist in the coordination of National Hurricane Center advisories and emergency evacuation activities with Federal, state, and local governments, and conducting post-flood evacuation studies.

Planning and Preparedness

Taking action to lessen the impact of hurricanes and coastal storms on communities and their residents. Activities include: evaluating and recommending improvements for emergency evacuation shelters, evaluating and developing emergency evacuation plans, and increasing public awareness of hurricane hazards through training and outreach programs.

Mitigation

Reducing the damage caused by hurricane winds and flooding through improvements in the built environment, including residential and non-residential buildings and their utility systems. Activities include: assessing building performance after significant hurricanes and coastal storms, developing designs for hazard resistant construction in new buildings and retrofitting techniques for existing buildings, and recommending improvements in state and local regulatory programs.
Congress showed its ongoing support for reducing the rising cost of disasters through hazard mitigation when it passed the Disaster Mitigation Act of 2000 (DMA 2000).

DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). The Stafford Act was signed into law in 1988 and amended the Disaster Relief Act of 1974. The Stafford Act provides the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and FEMA programs.

DMA 2000 created an emphasis on hazard mitigation planning at the State and local levels of government and established a national program for pre-disaster hazard mitigation.

The DMA calls upon States to:

- Coordinate State and local government activities related to hazard mitigation.
- Prepare and submit a State Mitigation Plan and update every 3 years as a condition for receiving certain forms of disaster assistance.
- Make available, from hazard mitigation grant programs, funds for assisting local jurisdictions with hazard mitigation planning and projects.
- Provide technical assistance and training to local governments in developing hazard mitigation plans, and in applying for and managing hazard mitigation grants for planning and for projects.

Local governments are asked to:

- Prepare and adopt a jurisdiction-wide natural hazard mitigation plan as a condition of receiving post-disaster grants for hazard mitigation.
- Review the hazard mitigation plan and, if necessary, update it every 5 years.
Lesson 1. Hazard Mitigation: Sustainable Futures for At-Risk Communities

Hazard Mitigation Best Practices

Throughout the United States, individuals, businesses, and communities have been taking action to reduce or prevent future damage from disasters. The following are examples of hazard mitigation best practices.

Flood Mitigation: Rising Above the Flood

Belhaven, North Carolina

The first thing that usually strikes visitors who enter the small harbor town of Belhaven (population 1,900) is that many of the homes, whether trailer or mansion, are elevated high enough to protect them from floodwaters. The town did not always look like it does now.

As a coastal town in North Carolina, Belhaven has often been battered by severe storms and hurricanes. In the last 8 years alone, it has been flooded by seven named storms and hurricanes, which resulted in tens of millions of dollars worth of damages. The public buildings that were regularly hit included the town’s elementary school and the beloved but low-lying town library.

As far back as 1933, when children would be read to in the window of O’Neal’s Drug Store, it was clear Belhaven needed a library. Still, it took almost two decades before a permanent library found a home on Main Street, just blocks from the picturesque Pantego Creek, which flows into the Pungo River. Because the town is located in the 100-year floodplain, the bungalow library remained in a vulnerable position for major flooding. “From 1996 to 1998 our former library flooded six times,” said branch librarian Joan Bogun. “Since we had outgrown it anyway, it only made sense to rebuild to survive future floods.”

After the devastation of Hurricane Fran in 1996, Belhaven city officials were determined to take action. They started an aggressive mitigation campaign to elevate structures. They would use Federal and State grant money where they could, and private money when the grant money ran out. “Our plan was to keep everybody out of harm’s way,” said Town Manager Tim M. Johnson.
Hazard Mitigation Successes (Continued)

**Flood Mitigation: Rising Above the Flood** (Continued)

*Belhaven, North Carolina*

Federal, State, and town officials worked together on two projects in the Hazard Mitigation Grant Program (HMGP), which is administered by the North Carolina Division of Emergency Management (NC DEM) and funded by FEMA. The first project elevated 232 eligible residences, and the second purchased Belhaven’s old elementary school with the money going toward a new school out of the 100-year floodplain. The residential elevations accelerated after Hurricane Floyd in 1999. Both projects were completed before landfall of Hurricane Isabel in September 2003.

Not everyone waited for Federal money, however. For instance, the often-flooded Belhaven public library was rebuilt and elevated through a substantial donation from a local patron, community fundraising, and a State disaster relief grant. Completed in November 2001, the new structure is large enough to hold community meetings, events, and local projects.

After Hurricane Isabel passed through North Carolina, media and disaster officials flocked to Belhaven as word spread of the success of its mitigation efforts. The story in Belhaven was the damage that did *not* happen.

Property owners who had elevated homes through HMGP funds experienced minimal or no flood damage from Isabel. The new library was also among the survivors. At the height of the storm, Belhaven’s Main Street was under 3 feet of water, but the library’s artwork and books remained above the surging waters.

Photo: Girl smiling in front of her “still standing” Belhaven home.
High Wind (Tornado) Mitigation: Above-Ground Safe Room
Moore, Oklahoma – New Home and Safe Room for Homeowners

Don Staley and his family are no strangers to storms and tornadoes. Their first home was hit by a tornado in October 1998 and suffered minor damage but was destroyed by another tornado on May 3, 1999. They rode out both storms inside the house. “It was such a frightening sound,” he said. “We decided we weren’t going to ride out another one inside the house.”

In December 2000, the Staley’s new home was ready. Shortly after moving in, they had an above-ground safe room constructed on the back patio. The concrete room has 8-inch thick walls, an 18-inch thick ceiling, a 10-inch foundation, and a sliding entry door made of 12-gauge steel with ¾-inch plywood on each side. The safe room is equipped with battery-powered lights and a battery-powered television.

When the warning sirens sounded on May 8, 2003, Don took shelter in the safe room along with his dog and two cats to ride out the storm feeling very protected and safe. “I was watching it on TV in there,” he recalled. “I could see it was coming my way and I could hear it coming. I could hear the roar. That’s a sound you never forget.”

When he emerged from the shelter, he found his house in shambles with the roof ripped off. Other houses on the street were also heavily damaged or destroyed. The Staleys used their safe room following the tornado to store and protect belongings they had salvaged.

The Staley’s home was among the more than 300 homes destroyed in the city that day. Whereas a severe tornado hit the city in May of 1999 claiming 44 lives, there were no deaths in the 2003 tornado. The absence of fatalities is attributed to community preparedness, improved early warning systems, and the many safe rooms and shelters that have been built.

Staley sums it all up, “The safe room saved my life, it came through with flying colors. It’s worth a million bucks to me.”
Earthquake Mitigation: Public School Retrofit Program
Lake Washington, Washington – Efforts Prompted By Parents and Staff

It was April 29, 1965, when the last major earthquake struck western Washington State. While aware of the possibility of another event, locals had been lax in their efforts to take action. With population growth over the years, and the building of more schools in the Lake Washington School District, parents and district staff members began vocalizing their concern about the risk of earthquake and what would happen to their children in such an event.

In early 1992, local engineers assessed the safety of the school buildings. Because schools did not have a lot of money, local funds would be used, and a plan was developed. The plan would determine the cost to complete structural and nonstructural projects for seismic retrofit.

The school district including Kirkland, Redmond, and parts of King County imposed a construction levy on the 1992 general election ballot to raise funds for seismic upgrades, a safety program, and also an Americans with Disabilities Act (ADA) program. A 2-year levy was initiated in 1996 and a 4-year levy in 1998 with total funds, for retrofit alone, in the amount of about $6 million. Structural and nonstructural retrofitting has been done.

On February 28, 2001, mitigation and safety measures in the Lake Washington School District were tested when a strong 6.8 earthquake struck the Nisqually Basin and Puget Sound area of western Washington. Most of the schools in the district are built on a liquefaction zone that caused the ground to “roll like jelly,” said Forrest Miller, Director of Support Services for the School System. “The buildings were all tested and nothing failed. The only thing that fell was one light fixture in the oldest building which was built in 1952.”

There are several successes to this story. Mr. Miller stated he is “so impressed with the people in this district who got things done!” Because of their vision and perseverance, lives as well as millions of dollars were saved. Due to their ongoing safety drills, the children and teachers were well trained, and were actually training the adults on what to do.

Custodians and other appropriate employees have received the Applied Technology Council (ATC) Training, which teaches rapid visual assessment of interior structures. Immediate inspection can be done after an incident, which in this case was instrumental in allowing classes to resume with minimal loss of time. Teachers and other school employees were tested beforehand to determine responsibility during earthquake and fire drills so every student would be accounted for and in their pre-decided location.
Earthquake Mitigation: Public School Retrofit Program (Continued)

Lake Washington, Washington – Efforts Prompted By Parents and Staff

The benefits are many. There are 25,000 students in the Lake Washington School District, which is the fifth largest in the state of Washington. There was no loss of life or injury, and 40 buildings in the district were saved by either new construction or seismic retrofit. To construct a new school building today would cost at least $36 million, and to find temporary housing for classrooms in case of damages would have cost thousands.

Flood (Storm Surge) Mitigation: Community Rating System Helps

Key Biscayne, Florida – Resulted From Hurricane Andrew

In 1992, Hurricane Andrew swept through southern Florida. The resulting storm surge and flooding destroyed a large portion of the Village of Key Biscayne and demonstrated the need for a plan to cope with flood hazards. Since entering the Community Rating System (CRS), the Village has implemented flood mitigation programs that reduce the impact of flooding, making it a safer community, while residents enjoy discounted flood insurance due to participation in the CRS.

The CRS has helped Key Biscayne to focus on systematic mitigation and has established an administrative link between the Village’s and Dade County’s mitigation activities. Three key activities promote hazard mitigation and inform the public about hazards and the benefits of flood insurance: the stormwater drainage maintenance program, an open space program, and the public outreach program. These three programs also helped the Village achieve a CRS rating of 6, giving residents outside the Special Flood Hazard Area (SFHA) a 10-percent reduction on their flood insurance premium, and a 20-percent reduction to residents within the SFHA.

Participation in the CRS has made Key Biscayne more vigilant in maintaining and improving the stormwater system. The Village is a co-permittee with Dade County and both have implemented a stormwater management program that reduces flooding and ensures that clean water is discharged into the waters of Dade County and the Village’s deep well system.

The Village conducts public outreach to inform citizens about ongoing hazard mitigation strategies, provide information on what to do in the event of a hazard and educate the public about why mitigation is important.

By participating in the CRS, Key Biscayne has reduced flood losses, saving lives and property, and increased awareness of hazards and hazard mitigation, while providing its citizens with discounted flood insurance.
Wildfire Mitigation: Defensible Space Saves Home

Novajo County, Arizona

The home of Lois Trimble is located in the Pinedale area, Navajo County, Arizona, just 10 miles northwest of Show Low. They built their house over the years and it became their primary residence in 1981. The entire area around this home was burned by the Rodeo-Chediski Fire that swept through the community in late June 2002. However, the Trimble home was unscathed.

Mrs. Trimble explained, “The fire started on Monday. On Tuesday we were told that the fire was out. Wednesday morning, ash was raining down all around us. My son called and told us that the fire had exploded; we looked and saw it coming over the ridge. We were told to evacuate. We had 1 hour. Because we had experienced this before 5 years ago, we knew exactly what to grab – important papers, some food, clothes, and photo albums. My husband is an invalid so my daughter and I had to do it all.” They were evacuated to the town of Eager and sheltered there until it was safe to return. The only building that survived the fire was their home.

Their home, while not damaged by fire, had smoke and soot inside and was not immediately habitable. During the previous few years, Mr. Trimble spread decomposed granite approximately 30 to 50 feet around his home. He keeps the pine needles clear because of the fire hazard they pose to their home. The decomposed granite also helps to keep the area clean after rain and absorbs any runoff. The Trimbles, in effect, created a defensible space. Trees, shrubs, and a garden area close to the house and within the cleared area did not burn. The fire leveled all of the neighbors’ homes and outbuildings as well as burning the trees in the forest.

The current market value of the Trimble property is approximately $200,000. The cost of one dump truck load of decomposed granite is $120. Mr. Trimble has used four truckloads of material at a cost of less than $500. Clearly, the low investment of time and materials was proven very effective to protect their home from this devastating wildfire.

Read more Mitigation Best Practices on FEMA’s website at http://www.fema.gov/fima/bp.shtm
Lesson 1. Hazard Mitigation: Sustainable Futures for At-Risk Communities

Summary

This unit underscored how devastating and costly disasters can be. Unless the Nation, especially at the local level, changes the way it builds communities, the cost of disasters will continue to rise.

Lesson 1 also covered concepts of sustainability, disaster-resistant communities, emergency management, and mitigation, and how they relate to each other. With well-thought-out and sound hazard mitigation planning, communities can become safer, stronger, and more sustainable for future generations. Federal hazard mitigation initiatives provide technical and financial assistance to these efforts.

DMA 2000 further empowers local governments and communities to strive for sustainability through jurisdiction-wide, all-hazard mitigation planning.

The next lesson will describe the steps a community needs to take to begin to build a sustainable community through mitigation planning.
Hazard Mitigation in Your Community

This lesson underscored how devastating and costly disasters can be. Unless the Nation, especially at the local level, changes the way it builds communities, the cost of disasters will continue to rise.

1. What are some examples of sustainable development in your community?

2. What are examples of disaster-resistant planning or disaster-resistant construction in your community?
Lesson 1. Hazard Mitigation: Sustainable Futures for At-Risk Communities

Test Yourself

1. Annually the dollar cost of disasters in the United States is:  
   (select one)  
   a.) thousands  
   b.) millions  
   c.) billions

2. In sustainable communities, decisions made by the present generation will:  
   (select one)  
   a) Reduce the options of future generations.  
   b) Not reduce the options of future generations.  
   c) Eliminate the options of future generations.  
   d) None of the above.

3. Three ways to reduce the risk of future hazard damages to new development are:

   ________________________________________________________________

   ________________________________________________________________

   ________________________________________________________________

4. Mitigation is defined as:  
   ______________________ actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects.  
   (select one)  
   a) fast  
   b) legal  
   c) sustained  
   d) construction

5. One example of a State responsibility under the Disaster Mitigation Act of 2000 is:  
   ________________________________________________________________.

6. One example of a local government responsibility under the Disaster Mitigation Act of 2000 is:  
   ________________________________________________________________.
7. Match the mitigation program with the appropriate description below:

a. NEHRP
b. NDSP
c. NHP
d. NFIP

_____ Goal is to reduce future flood damage through floodplain management and to provide flood insurance.

_____ Includes grants to state dam safety programs and train dam safety staff.

_____ Long-term nationwide program to reduce risk to life and property from earthquakes in the U.S.

_____ Supports projects and activities to protect communities from hurricane hazards.
Lesson 2. Gaining Support for Hazard Mitigation

Introduction

Lesson 1 introduced the Disaster Mitigation Act of 2000 (DMA 2000) and its intent to focus resources and communities on pre-disaster hazard mitigation and reducing disaster costs. Lesson 2 emphasizes the need for a systematic approach to community hazard mitigation, beginning with a hazard mitigation plan. An effective hazard mitigation planning process is the critical first step in making a community more disaster-resistant. This lesson introduces a methodical approach for developing a community hazard mitigation program, and highlights the first step, which is to gain community support. At the completion of this lesson, you will be able to:

- Describe a process for developing a local hazard mitigation program.
- Describe the key steps to initiating a hazard mitigation program and preparing the community for hazard mitigation planning.
- Practice identifying local stakeholders.

A Process for Building a Community Hazard Mitigation Program

Community action for developing and implementing a hazard mitigation program can be organized into the same four phases that are necessary to develop a hazard mitigation plan. Phase I is Organize Resources. In this phase, identify and obtain the human resources and support needed to initiate and sustain a successful hazard mitigation program in your community. Figure out what it will take for the community to support hazard mitigation planning and actions, and who must be represented on a team to ensure the success of the process.

Phase II is Assess Risks. The basis for effective hazard mitigation is thorough assessment of possible hazards to the community. In this phase you will determine, for each potential hazard, the probability of an event, the potential severity of the event, and the potential impact on the community in terms of human and dollar losses. These efforts may be accomplished by the community with assistance from the State, or contracted out to a company that specializes in this type of work.

Phase III is Develop the Mitigation Plan. The direction of the hazard mitigation plan is determined by the results of the risk assessment and the community’s current and potential capabilities. In this phase you will develop hazard mitigation goals and objectives, identify possible actions to reduce high priority risks, and develop a prioritized strategy. The phase is complete when all of these are put together in a plan that will be supported by the community, accepted by the local governing body, and approved by FEMA.
Phase IV is **Implement the Mitigation Strategy and Monitor Progress**. In this phase, you seek the resources and opportunities to achieve the plan’s goals and objectives, and make sure the plan is kept current.

**Getting Started**

At the beginning of the process, it is important to decide whether your community will develop its own program and hazard mitigation plan or will join with other communities in a larger jurisdiction, such as a county, planning and development district, watershed, regional planning commission, or even multiple counties. If your community has entered into what is called a “multi-jurisdictional” plan, you should know that the DMA 2000 requires that each community wishing to receive hazard mitigation funds must participate in the planning process and officially adopt the plan.

The State also will have a hazard mitigation strategy that will identify priorities for addressing hazard risks in the State. Communicate with the State Hazard Mitigation Officer (SHMO) to find out more about those priorities. The SHMO is usually located in Emergency Management, which can be a stand-alone agency or part of another department such as natural resources, community affairs, public safety, or the military department.

The process of gaining support for hazard mitigation can be carried out in three steps which are consistent with those described in FEMA’s planning guide entitled, “Getting Started: Building Support for Mitigation Planning.”

Step 1: Assess Community Support
Step 2: Build the Hazard Mitigation Planning Team
Step 3: Engage the Public
Lesson 2. Gaining Support for Hazard Mitigation

Step 1: Assess Community Support

Determine if the community is ready to launch a hazard mitigation program. The key elements necessary for successful planning and program development are knowledge, support, and resources.

Knowledge

Do local officials know what hazards and risks threaten the community? It is important to determine the level of knowledge about hazards and risks among officials and the public. If elected or appointed officials and/or citizens lack knowledge about hazards and risk, find opportunities to share:

- Disaster statistics and public safety impacts of disasters, particularly the last hazard event to affect the community.
- Economic costs of hazard events and benefits of hazard mitigation.
- Hazard mitigation success stories.
- Economic benefits and costs that would be associated with public actions.
- Benefits of hazard mitigation planning.

Support

Do your local officials support hazard mitigation planning and other sustained actions to reduce the risk of damages to the community? Talk with elected and appointed officials to find out if they know the local, State, and Federal roles in hazard mitigation. Determine the likelihood of finding a champion to provide leadership and/or support for hazard mitigation planning.

If support for hazard mitigation planning is weak, enlist organizations and groups that have needs and responsibilities for reducing hazard risks, such as local and State government and FEMA, businesses at risk of hazard damages, private-sector nonprofits involved in supporting disaster victims, citizens living in high-risk areas, academic institutions, prominent local leaders, and elected officials.

Identify existing local initiatives that could provide a “jumping-off point” for the hazard mitigation program, such as:

- Comprehensive, long-term plans for the future development and improvement of the community.
- National Flood Insurance Program (NFIP), a Federal initiative that makes subsidized flood insurance available for existing buildings if the community adopts and enforces floodplain management regulations.
- Community Rating System (CRS), a program in some communities where floodplain management programs go beyond the minimum requirements for participation in the NFIP. CRS communities’ efforts are recognized and rewarded by reducing flood insurance premiums for the community’s property owners.
Lesson 2. Gaining Support for Hazard Mitigation

Step 1: Assess Community Support (Continued)

Resources

Does your community have the technical, financial, and human resources to develop a hazard mitigation plan and implement its recommendations? There are many technical assistance resources at the local, State, and Federal level for hazard mitigation planning and projects, including local engineers and planners, colleges and universities, regional planning associations, and professional associations.

Financial resources for hazard mitigation planning and mitigation projects may be available pre-disaster from Federal programs such as FEMA hazard mitigation grants and Department of Housing and Urban Development community development block grants. After a disaster, other Federal resources are available. These resources will be discussed in Lesson 5.

In addition to local, State, and Federal agency representatives, human resources to work on the program may come from the community’s citizens, businesses, and association leaders who want to help reduce hazard risks to the community.

Step 2: Build the Hazard Mitigation Planning Team

Once the community is ready to begin hazard mitigation planning, it is time to identify dedicated and interested individuals to be on the hazard mitigation planning team. Build the team from existing organizations or boards whenever possible. If the community already has a hazard mitigation plan that was developed prior to DMA 2000, contact those who led that planning effort.

Get representation from:

- Stakeholder groups that will be affected in any way by a hazard mitigation action or policy, such as businesses, private organizations, and citizens.
- Neighborhood groups, other nonprofit organizations and associations, and business organizations.
- Elected officials and Federal Government agencies involved in hazard mitigation (e.g., FEMA, the Environmental Protection Agency, the Corps of Engineers), State and regional government agencies, and academic institutions.
Obtain Official Recognition for the Hazard Mitigation Planning Team

Hazard mitigation planning efforts will be more successful if the team has official authority to develop and implement a hazard mitigation plan. Ask the local governing body to recognize the importance of the process in the form of a local executive order, a proclamation, a memorandum of agreement (MOA), or a memorandum of understanding (MOU).

Organize the Team

Develop a mission statement that will describe the overall purpose of developing a hazard mitigation plan. The mission statement should answer these questions:

- Why is the plan being developed?
- What does the plan do?
- For whom or where is the plan being developed?
- How does the plan do this?

An example of a mission statement is: *To foster, promote, and implement actions to eliminate or reduce the long-term risk to human life and property from the effects of natural hazards.*

Establish responsibilities of team members so that they know how much time they will need to dedicate.
Lesson 2. Gaining Support for Hazard Mitigation

Step 3: Engage the Public

The public (residents, businesses, and other interested parties) needs the opportunity to ask questions, make suggestions, and comment on the hazard mitigation plan during the drafting stage and prior to plan approval. Provide opportunities for neighboring communities, agencies involved in hazard mitigation, businesses, academia, and other relevant private and nonprofit interests to be involved as well. Citizens who become knowledgeable about the initiative may be willing to assist later in the implementation process.

There are many ways to keep the public informed and offer opportunities to become involved, including:

- Use local media. Broadcast meetings on a local access channel, produce a show highlighting recent disasters and damages, interview a hazard mitigation planning team member, and issue press releases.
- Distribute brochures and fliers with local utility and water bills, at local grocery stores, at government buildings, and at local libraries.
- Conduct outreach activities at local festivals, fairs and bazaars. Set up a booth or table for hazard mitigation-related brochures, talk with citizens, get your hazard mitigation planning team connected to the Internet, create a Web page, and/or post questionnaires.
- Host public input workshops for large or small groups of community representatives, business representatives, and residents.

Photo: Public meeting.
Lesson 2. Gaining Support for Hazard Mitigation

Summary

A systematic approach is needed to successfully establish a hazard mitigation program, develop a hazard mitigation plan, and implement a hazard mitigation strategy. Four logical steps are to organize resources, assess risks, develop the hazard mitigation plan, and implement the mitigation strategy. This lesson described a process for initiating a community hazard mitigation program: assessing the community’s readiness for hazard mitigation, identifying technical and other assets needed and available, establishing a hazard mitigation planning team, and engaging the public.

For more detailed instructions on how to get the community hazard mitigation program going, refer to the FEMA 386-1 publication, “Getting Started: Building Support for Mitigation Planning.”

The next lesson, Assessing Risks, will focus on the data needed to provide a foundation for an effective, cost-beneficial hazard mitigation strategy.
Lesson 2. Gaining Support for Hazard Mitigation

Hazard Mitigation in Your Community

List individuals you would ask to be members of your hazard mitigation planning team. Then list organizations you would want to be represented and will contact to identify the appropriate team member.
Lesson 2. Gaining Support for Hazard Mitigation

Test Yourself

1. A process for developing and implementing a hazard mitigation plan can be organized into the following four phases:

I: __________________________________________________________________________
II: __________________________________________________________________________
III: __________________________________________________________________________
IV: __________________________________________________________________________

2. Three steps for gaining support for hazard mitigation include:

Step 1: ________________________________________________________________________
Step 2: ________________________________________________________________________
Step 3: ________________________________________________________________________

3. If elected/appointed officials and citizens lack knowledge about hazards and risk, find opportunities to share: (check all that apply)

☐ Disaster statistics and public safety impacts of disasters, particularly the last hazard event to affect the community.
☐ High costs of hazard mitigation planning.
☐ Economic costs of hazard events and benefits of hazard mitigation.
☐ Hazard mitigation success stories.

4. Hazard mitigation planning efforts will be more successful if the team has official ________________ to develop and implement a hazard mitigation plan.

5. Three ways to engage the public in the hazard mitigation planning process are:

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
6. According to the Disaster Mitigation Act of 2000, each community entering into a “multi-jurisdictional” plan must do this in order to receive hazard mitigation funds: (select one)
   a) Have demonstrated capability to perform hazard risk assessments.
   b) Sign an agreement to provide a designated percentage of the costs to develop the plan.
   c) Participate in the planning process and officially adopt the plan.
   d) Have incurred substantial damage due to hazard events within the last five years.

8. **True or False.** Citizens who become knowledgeable about the process of hazard mitigation planning may be willing to assist later in the implementation process.
Lesson 3. Assessing Risks

Introduction

This lesson describes a methodology that can be used by communities to determine what hazards potentially threaten a community and how vulnerable the community is to those risks. Once completed, a community has valuable data to use as the basis for the hazard mitigation plan, emergency plans, and other long-term community planning mechanisms.

A Systematic Approach to Assessing Risks

Risk Assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from hazards. This process is accomplished by completing four steps, which are described in FEMA’s planning guide entitled, “Understanding Your Risks: Identifying and Estimating Hazard Losses.”

Step 1: Identify hazards.
Step 2: Profile hazard events.
Step 3: Inventory assets.
Step 4: Estimate losses.

Risk Assessment Terms

Before we proceed, there are some important risk assessment terms that are sometimes misunderstood and therefore will be defined, namely hazards, vulnerability, exposure, and risk.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard</td>
<td>A hazard is an act or phenomenon that has the potential to produce harm or other undesirable consequences to a person or thing. Hazards exist with or without the presence of people and land development. Earthquakes, hurricanes, tornadoes, and other geological and meteorological events have been occurring for a very long time, and the natural environment adapted to their impacts. Hazard identification is the process of identifying hazards that threaten a given area.</td>
</tr>
<tr>
<td>Vulnerability</td>
<td>Vulnerability is susceptibility to physical injury, harm, damage, or economic loss. It depends on an asset’s construction, contents, and economic value of its functions. Vulnerability assessment provides the extent of injury and damages that may result from a hazard event of a given intensity in a given area.</td>
</tr>
<tr>
<td>Exposure</td>
<td>Exposure is the people, property, systems, or functions that could be lost to a hazard. Generally exposure includes what lies in the area the hazard could affect.</td>
</tr>
<tr>
<td>Risk</td>
<td>Risk depends on all three factors: hazard, vulnerability, and exposure. Risk is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. It refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.</td>
</tr>
</tbody>
</table>
Lesson 3. Assessing Risks

**Step 1: Identify Hazards**

This step answers the question: What kind of hazards can affect your community?

There are many ways to find hazard information. Review existing plans, such as emergency operations plans. Hazards may be described there. Search old newspapers and other historical records. Talk to the experts in the community, State, or region. Gather information such as hazard maps on Internet websites of agencies such as FEMA, Department of Homeland Security, U.S. Geological Survey (USGS), the National Oceanographic and Atmospheric Agency (NOAA), and the U.S. Forest Service.

If preliminary research reveals that your community or State has been directly affected by a specific hazard, or that your area is threatened by one, address it in greater detail later in the process. If the area has not been affected by a hazard event in several years, but it is identified as a possible threat, confirm that the hazard type is relevant by going to the websites of the agencies listed above.

Completion of this step will produce a list of hazards that could affect the community. Another benefit of this research is to begin to foster relationships with experts at the State and community levels.

**Step 2: Profile Hazard Events**

This step answers the question: “How bad can it get?”

Profiling hazards is necessary because each hazard type has unique characteristics that can cause different types of damage. In addition, the same hazard events may affect communities in different ways because of various community characteristics, such as geography, development trends, population distribution, and age and type of buildings.

A hazard profile includes:

- The location or geographical areas that would be affected.
- The hazard extent (magnitude or severity). For hazards not geographically determined, like tornadoes, recorded intensities of previous events are used.
- The probability, likelihood, or frequency of the event occurring.
- Any past occurrences of the hazard events in or near the community.

The best way to show areas affected by hazards is to record the data on a base map. A base map should be as complete, accurate, and current as possible. Depending on community resources, it can be as sophisticated as a digital display or as simple as a paper map of the community.
Lesson 3. Assessing Risks

Step 2: Profile Hazard Events (Continued)

For example, transfer flood boundaries and base flood elevations (BFEs) from a FEMA Flood Insurance Rate Map (FIRM) onto the base map. If there is an earthquake risk, transfer the Peak Ground Acceleration (PGA) zones from a USGS map onto the base map. Completion of this step will produce a map showing the area impacted by each hazard type.

Step 3: Inventory Assets

Step 3 answers the question: “What assets will be affected by the hazard event?”

Assets are the people, property, and activities in a community. The product of this step is a list of the assets in the community. This enables hazard mitigation planning teams to understand what can be affected by different hazard events. The level of detail in this step will determine the quality of the loss estimate in the final risk assessment step.

Incorporate in the asset inventory an overview, or summary, of the impact on the community's vulnerable structures. Include, by type of hazard, a general description of the types of structures (e.g., buildings, infrastructure, and critical facilities) affected by the hazard. For example, flooding will affect all structures whose lowest floors are built below the base flood elevation. Include a general description of the extent of the hazard's impact to vulnerable structures. This description can be presented in terms of dollar values or percentage of damages.

Among the most urgent and important assets within the community are critical facilities. The community will be able to make better decisions about how to expend resources to protect critical facilities as a result of this type of assessment. Critical facilities include the following:

- **Essential facilities** for the health and welfare of the whole population (e.g., hospitals, police and fire stations, emergency operations centers, evacuation shelters, and schools).
- **Transportation systems**, including airways, highways, railways, and waterways.
- **Lifeline utility systems**, such as potable water, wastewater, oil, natural gas, electric power, and communication systems.
- **High potential loss facilities**, such as nuclear power plants, dams, and military installations.
- **Hazardous material facilities**, producing industrial/hazardous materials (e.g., corrosives, explosives, flammable materials, radioactive materials, and toxins).
Step 3: Inventory Assets (Continued)

If the community has the resources to take the inventory to a greater level of detail, it is possible to determine the proportion of buildings, the value of buildings, and the population of hazard areas. Keep track of the inventory data gathered for each hazard being assessed.

This step should also include a look at the location(s) of expected growth in the community. This information can be found by referring to the local comprehensive plan, or talking with community officials to determine where future growth is expected to take place. Are those areas located within hazard areas?

The FEMA criteria for approval of a local hazard mitigation plan do not require any greater detail in the risk assessment. However, the asset inventory at this point includes only the total estimated population, number of buildings, and value of buildings in the hazard area. Ending the inventory now provides only a very broad picture of potential damage from a hazard event. It will not allow you to specify the structures at greatest risk of damage, making objective determination of mitigation priorities difficult in the next phase of the planning process.

The following questions will help you determine how much more information to collect, if any.

Do you have enough data to determine:

- Where greatest damages may occur?
- Where critical facilities will be operational after an event?
- Which assets are subject to greatest potential damages?
- If historic, environmental, or cultural resources are vulnerable?
- Severity, repetitiveness, or likelihood of particular hazard?
- Benefit of mitigation actions?

If the planning team decides to proceed, it will gather information on the assets that can be damaged by a hazard event. Characteristics of different hazards create the need for different types of data. For example, for flooding the following data are needed:

- Building type/type of foundation.
- Building code design level/date of construction (i.e., before or after the floodplain ordinance?).
- Topography.
- Distance from hazard zone (flood zone).
Step 4: Estimate Losses

Step 4 answers the question: “How will the community’s assets be affected by the hazard event?” This step provides the community and the State with a common framework in which to measure the effects of hazards on vulnerable structures. Steps 1 to 3 of the risk assessment phase involve gathering data on the hazards that may affect the community and the assets that can be damaged by the hazard event. All that information will be put to use in the fourth and final step, Estimate Losses.

This step is not required for approval of a local hazard mitigation plan by FEMA. If it is completed, it does provide a greater degree of dependability upon which to base the hazard mitigation strategy. The following list of activities provides only a brief synopsis of how to complete a loss estimate:

- Estimate the losses to structures.
- Estimate the losses to contents.
- Estimate the losses to structure use and function.
- Calculate the loss from each hazard event.
- Calculate the losses to each asset.
- Calculate the estimated damages for each hazard event.

Create a composite map of the risk assessment data that have been collected and mapped, and create a composite loss map. A composite map overlays the results of individual hazard maps to determine areas with relatively more assets at risk than others.

FEMA has developed a loss estimation model that is useful in estimating losses from earthquakes, floods and hurricane winds. HAZUS-MH is a geographic information system (GIS) software package that uses census data and other existing databases to estimate damage and losses, including:

- Physical damage: damage to residential and commercial buildings, schools, critical facilities, and infrastructure;
- Economic loss: lost jobs, business interruptions, repair and reconstruction costs; and
- Social impacts: impacts to people, including requirements for shelters and medical aid.

During the past decade, HAZUS-MH has evolved into a powerful tool for mitigation and recovery planning and analysis. An increasing number of states and localities are using HAZUS-MH in the preparation of risk assessments and mitigation plans under the Disaster Mitigation Act of 2000. HAZUS-MH is also being used to support post-disaster planning for recovery from hurricanes, earthquakes, and floods.
Lesson 3. Assessing Risks

Step 4: Estimate Losses

States and communities may obtain free HAZUS-MH software and training from FEMA. Information is available at www.FEMA.gov/hazus.

HAZUS-MH can be used by individuals and organizations with limited knowledge of hazard analysis, as well as by those with extensive expertise in the earth, building, and GIS sciences due to its diverse range of options. FEMA has developed a free on-line seminar that provides an overview of the capabilities of HAZUS-MH and how it can support mitigation, response, and recovery efforts. You can find this seminar at http://campus.esri.com/acb2000/showdetl.cfm?did=6&Product_id=851&CFID=1679765&CFTOKEN=55742665 or go to http://campus.esri.com/campus/home/workshoplist.cfm and look for Hazus.

Summary

Note that each community will determine for itself what constitutes “moderate,” “high,” and “extreme” vulnerability criteria.

The risk assessment steps taken in this phase of the mitigation planning process provide the basis for developing a multi-hazard mitigation plan.

This unit has included methods for answering the following questions:

- What kinds of hazards can affect the community?
- How bad can it get?
- What will be affected by these hazards?
- How will these hazards affect the community?

For more detailed instructions on how to complete each step of the risk assessment process, refer to the FEMA publication 386-2, “Understanding Your Risks: Identifying Hazards and Estimating Losses.”
Lesson 3. Assessing Risks

Hazard Mitigation in Your Community

Based on your knowledge of your community, complete the following table to determine what hazards you might be considering in your risk assessment.

<table>
<thead>
<tr>
<th>Type of Hazard</th>
<th>Frequency: Times in the last</th>
<th>Population Impact</th>
<th>Property Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 yrs. 10 yrs. 20 yrs.</td>
<td>High Med Low</td>
<td>High Med Low</td>
</tr>
<tr>
<td>Aircraft Accident</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avalanche</td>
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<td></td>
<td></td>
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<tr>
<td>Civil Disorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Storm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication (disruption)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dam Failure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drought</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Earthquake</td>
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<td></td>
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<tr>
<td>Extreme Heat</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Flood (rapid snow melt, ice jam, heavy rain)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HAZMAT (fixed facility, transportation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hurricane</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Landslide (earthquake included, rain-induced)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lightning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Emergency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility Interruption (communication, electricity, natural gas)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiological (fixed facility, transportation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsidence (sinkhole)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thunderstorm (microburst)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Hazard Mitigation in Your Community (Continued)

<table>
<thead>
<tr>
<th>Type of Hazard</th>
<th>Frequency: Times in the last</th>
<th>Population Impact</th>
<th>Property Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 yrs.</td>
<td>10 yrs.</td>
<td>20 yrs.</td>
</tr>
<tr>
<td>Tornado (microburst)</td>
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<tr>
<td>Transportation (air, rail, interstate, primary highway, county/city roads, military missile)</td>
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<tr>
<td>Urban Fire (conflagration)</td>
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<tr>
<td>Volcanic Ash</td>
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<tr>
<td>Volcanic Explosion</td>
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<tr>
<td>Wildland Fire (urban interface, public land, private land)</td>
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<tr>
<td>Winter Storm (snow, ice, extreme cold)</td>
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<tr>
<td>Chemical</td>
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<tr>
<td>Biological</td>
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<tr>
<td>Explosion</td>
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<td>Arson</td>
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<tr>
<td>Release</td>
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</table>
Lesson 3. Assessing Risks

Test Yourself

1. Match the terms with their definitions.

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Vulnerability</th>
<th>Exposure</th>
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</thead>
<tbody>
<tr>
<td>Risk</td>
<td>Risk assessment</td>
<td></td>
</tr>
</tbody>
</table>

_____________ is the estimated impact that a hazard would have on people, services, facilities, and structures in a community.

_____________ is an act or phenomenon that has the potential to produce harm or other undesirable consequences to a person or thing.

_____________ is the people, property, systems, or functions that could be lost to a hazard.

_____________ is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from hazards.

_____________ is the susceptibility to physical injury, harm, damage, or economic loss.

2. The four major steps of a risk assessment are:

3. Three ways to find hazard information are:

4. A hazard profile includes: (select all that apply)
   - Location or geographical areas not affected by the hazard event.
   - Hazard magnitude or severity.
   - Probability, likelihood, or frequency of the hazard event occurring.
   - Any past occurrences of the hazard events in or near the community.
   - Benefit-cost analysis of the community’s sustainability quotient.

5. Among the most urgent and important assets within the community are ____________ facilities.
6. **True or False.** Loss estimation is not required for approval of a local hazard mitigation plan by FEMA, but provides valuable information to the selection of the mitigation strategy.

7. ____________ is the loss estimation software program that is useful in predicting the physical, economic, and social impacts of various hazard events.
Lesson 4. Building and Implementing a Community Hazard Mitigation Plan

Introduction

With the completion of the risk assessment described in Lesson 3, a community’s hazard mitigation team can make decisions about the best way to reduce the risk of future hazard damages. As you complete Lesson 4 you will see how the results of the risk assessment are used as a basis for a community hazard mitigation strategy, and will then practice developing a strategy. The lesson also covers what should be included in the hazard mitigation plan so that it meets not only the community’s needs, but the FEMA criteria for approval under 44 CFR Part 201.6.

After completing this lesson, you will be able to:

- Follow a systematic process to develop a hazard mitigation strategy.
- Describe six categories of hazard mitigation actions that may be included in the strategy.
- Identify criteria used to decide what hazard mitigation actions are best for a community.
- Describe a strategy for implementing and maintaining the community hazard mitigation plan.

Steps to Developing the Mitigation Plan

The following steps outline a process for developing the community hazard mitigation plan, consistent with the FEMA hazard mitigation planning guide “Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies:”

1. Establish hazard mitigation goals and objectives.
2. Identify and prioritize hazard mitigation actions.
3. Prepare the implementation strategy.
4. Document the planning process.

The Hazard Mitigation Strategy

Once complete it is important to compile the results of the entire risk assessment into a written report. The report can be presented to citizens and elected officials. The State Hazard Mitigation Officer (SHMO) also will want the results to compare with, or incorporate into, the Statewide risk assessment. The results of the risk assessment will draw attention from a wide range of local sectors, presenting a great opportunity to use the results to galvanize the community’s interest in hazard mitigation and in the hazard mitigation planning process.
Lesson 4. Building and Implementing a Community Hazard Mitigation Plan

The Hazard Mitigation Strategy (Continued)

Based on the risk assessment results, the hazard mitigation planning team can set mitigation goals, refine them, and begin work on the hazard mitigation strategy. A hazard mitigation strategy provides direction for the community’s efforts to reduce the potential losses identified in the risk assessment. If the strategy is to be implemented, it must be based on existing local authorities, policies, programs, and resources. The approach should be flexible enough to be expanded, reduced, and/or improved if existing conditions change.

Benefit-cost review of proposed hazard mitigation actions will be helpful in establishing priorities for the strategy because such an analysis looks at the effectiveness of the actions with respect to their cost. Note that FEMA’s hazard mitigation plan review criteria require each community participating in a multi-jurisdictional planning effort to identify the specific actions they will undertake.

Step 1: Establish Hazard Mitigation Goals and Objectives

First review and analyze the results of the Risk Assessment’s Hazards Profiles and, if completed, the Loss Estimation. Reviewing these findings will help clarify problems, issues, and opportunities for hazard mitigation. Develop a list of problem statements that address the risk in terms of what, where, how often, and how bad.

For example:

Fire Station Number Two on Main Street floods every time a nor’easter strikes Bull Island at high tide, forcing the Fire Department to move the equipment to Fire Station Number One and leaving the eastern end of the city vulnerable in terms of fire protection. In the past 10 years this has happened 14 times.

Base your community’s mitigation goals on the findings of the local and State risk assessments. Describe the long-term vision for hazard reduction or enhancement of mitigation capabilities. Goals are not intended to identify specific mitigation actions, but identify the overall improvements you want to achieve. Remember that goals are general guidelines that describe what you want to achieve in the long run.

Examples of goals:
- Protect and expand essential facilities.
- Improve the quality of life in the community.
- Ensure that public funds are used in the most efficient manner.
Objectives define strategies or steps to achieve the goals that have been set. They are more specific and narrower in scope than goals. It is important that the objectives be measurable so you will know when you have successfully implemented the strategy. Involve the public when developing the community’s goals and objectives to ensure fair representation of all sectors in the community.

Examples of objectives:
- Move or build Fire Station Number Two in a location out of the floodplain, as close as possible to the at-risk homes in the East End.
- Include upgrades in the construction of Fire Station Number Two so that the building will withstand wind speeds up to 150 miles per hour.
- Include in the construction of Fire Station Number Two space for a community shelter that can house up to 200 shelterees.

Step 2: Identify and Prioritize Hazard Mitigation Actions

Hazard mitigation strategies to reduce specific risks can vary from very simple to complex. They are comprised of one or more hazard mitigation actions. There are so many different hazard mitigation actions that they are often classified into six categories:

- Prevention.
- Property protection.
- Public education and awareness.
- Natural resource protection.
- Critical facilities protection.
- Structural projects.

Prevention

Prevention actions are intended to keep a hazard risk problem from getting worse. They ensure that future development does not increase hazard losses. Communities can achieve significant progress toward hazard resistance through prevention actions. This is particularly true in areas that have not been developed. Types (and examples) of prevention actions are:

- Planning and zoning (floodplain regulations).
- Open space preservation (parks and recreation areas).
- Land development regulations (large lot sizes).
- Storm water management (clear ditches/larger retention basins).
- Coastal barrier protection (building behind dunes).
- Capital improvement planning (no infrastructure extended into hazard area).
- Building codes.
Step 2: Identify and Prioritize Hazard Mitigation Actions (Continued)

Property Protection

Property protection actions are used to modify buildings subject to hazard risk, or their surroundings, rather than to prevent the hazard from occurring. A community may find these to be inexpensive actions because often they are implemented or cost-shared with property owners. These actions directly protect people and property at risk. Protecting a building does not have to affect the building’s appearance and is therefore a popular action for historic and cultural sites. Some examples of property protection actions are:

- Acquisition.
- Relocation.
- Rebuilding.
- Floodproofing.

Acquisition is the public procurement and management of lands that are vulnerable to damage from hazards. Following acquisition, land uses more appropriate to the degree of risk may be chosen. Public acquisition has been achieved by:

- Purchase at full market value.
- Purchase at less than full market value through methods such as foreclosure of tax delinquent property, bargain sales, and purchase and lease back.
- Donation through reserved real estate, donation by will, and donation and lease back.
- Leases and easements.

Relocation involves permanent evacuation of hazard-prone areas through movement of existing hazard-prone development and population to safer areas. Two common components of relocation are:

- Physical removal of buildings to a safer area with the future use of the vacated area limited to permanent open space.
- Substitution of existing uses for others that are less vulnerable to the hazard.

Rebuilding or modifying structures to reduce damage by future hazard events is another type of property protection action.

- Masonry structures can be retrofitted to lessen damage in earthquakes.
- Manufactured homes can be anchored to withstand hurricane wind speeds without significant damage.
- Storm shutters can be installed to protect windows and glass doors from flying debris in areas at risk from high winds.

Ideally, adoption and/or enforcement of building codes accompany rebuilding of damaged or hazard-prone structures to minimize future risk of hazard damage.
Floodproofing is protecting a flood-prone building using one or more of several different methods. Dry floodproofing means sealing a building against floodwater by making all areas below the flood protection level watertight. Wet floodproofing means allowing the floodwaters to enter the building to minimize pressure on the structure. Furniture, appliances, and valuables may be moved out of the floodable area.

Relocation Example:

The Castaic Union School District in southern California is located in an area through which the San Andreas and San Gabriel fault systems pass. The District conducted an assessment of earthquake risks that threatened their elementary and middle schools and administration building. The study led the school district to conclude that the probability of a large earthquake affecting these facilities was high. In addition to expected seismic damage, the study showed that the school buildings were located within the inundation area of the Castaic Dam, and at high risk of damage from fire and explosion if crude oil pipelines that cross the campus should fail.

Based on estimates of potential casualties, building and content damages, and lost educational services, the school district decided to condemn the structures on the high-risk site. The area selected for relocation is completely out of the dam inundation area and far removed from the oil pipelines. The new buildings were constructed to conform fully to 1995 building code provisions that make them more resistant to seismic damage than the ones they replaced.

Public Education and Awareness

Public education and awareness activities inform and remind people about hazardous areas and the actions necessary to avoid potential damage and injury. The public can be informed about hazard mitigation through several avenues. Some examples include:

- Providing hazard maps and other hazard information.
- Website.
- Outreach programs that provide hazard and mitigation information to people when they have not asked for it.
- Asking business owners to provide hazard mitigation information to employees.
- Mass mailings.
- Notices to residents and property owners in a specific, hazard-prone area.
- Displays in widely used facilities, such as public buildings and malls.
- Print media, radio/TV spots and interviews.
- Public access TV channel announcements.
Step 2: Identify and Prioritize Hazard Mitigation Actions (Continued)

Public Education and Awareness (Continued)

- Videotape/property owner handbook.
- Presentations at meetings of neighborhood groups.
- Tab in phone book.
- Real estate disclosure.
- Information in the public library or a library developed specifically for hazard mitigation information.
- Available technical assistance.
- School-age and adult education.

Earthquake Outreach Example

What do Starbucks Corporation, the Boeing Company, and the Friday Harbor Flower Shop have in common? All are businesses, all are located near Seattle, and all are taking an active role in keeping their employees safe and making their businesses more disaster resistant from earthquakes and other hazards.

The Cascadia Region Earthquake Workgroup (CREW) is a non-profit action group on a mission. In 1996, the scientific community established CREW to promote awareness of seismic risk among businesses and emergency managers. The Nisqually earthquake in February 2001 provided CREW and its partners with an important opportunity to assess lessons learned and to take additional steps to mitigate against damage from future earthquakes. Since the Nisqually earthquake, CREW has sponsored conferences and held forums to showcase both successes and failures during the Nisqually earthquake, and how to apply those lessons learned to a variety of other hazards, including man-made hazards.

In April 2003, CREW released a 20-minute video directed at small- and medium-sized businesses. Using the lessons learned from Nisqually, the message of the video is “protect your people, your buildings, and your business.” The video, which highlights the work of Starbucks, Boeing, and the Friday Harbor Flower Shop, was distributed along with a tool kit developed in partnership with the Institute for Business and Home Safety (IBHS). CREW also meets with the Seattle Chamber of Commerce and other Chambers of Commerce to establish coordinating centers with businesses, and will continue to sponsor its series of business forums.
Natural Resource Protection

Natural resource protection actions are intended to reduce the intensity of hazard effects as well as to improve the quality of the environment and wildlife habitats. Parks, recreation, or conservation agencies or organizations usually implement these activities. Examples of natural resource protection include:

- Erosion and sediment control.
- Wetlands protection.
- Dune restoration.
- Reforestation.
- Terracing.
- Beach nourishment.

Natural Resource Protection Examples:

- After Hurricane Hugo, it was found that South Carolina beaches, at which white sandy clay had been deposited prior to the storm to slow erosion, exhibited much less erosion than adjacent natural beaches.

- Between 1984 and 1993 Iowa instituted farm conservation projects including no tillage of certain areas, and use of terracing, contouring, and strip cropping. Authorities estimated that damage from the 1993 floods would have been 3.5 times greater without these actions.

Critical Facilities Protection

Critical facilities protection is essential because critical facilities can have a huge effect on the scope of the damage as well as the ability of the community to respond and recover from a hazard event.

Critical facilities include:

- Essential facilities, such as police stations, fire stations, and hospitals that are vital to the response effort.
- Special facilities that house populations requiring special consideration, such as nursing homes and prisons.
- Facilities that can create secondary hazards, such as nuclear powerplants and hazardous materials production or storage facilities.
Critical Facilities Protection Example:

The service area for Beebe Medical Center in Lewes, Delaware, is the fastest growing population center in Delaware. Because of nearby resort beaches, the population and the service requirements expand exponentially during vacation periods. From experiences during previous hurricanes, the Lewes area can expect interrupted electrical power supply, interrupted water supply and wastewater treatment, street flooding, high winds, and windborne debris. Penetration of building envelopes would allow both wind and rain to damage building interiors and contents.

Beebe Medical Center developed mitigation priorities and determined that installation of storm shutters is the number one mitigation priority. Because of the relatively high cost of permanent storm shutters, the Medical Center has signed a contract with a local contractor to install inexpensive plywood storm shutters in the event of a hurricane warning. Meanwhile, hazard mitigation grants have been used to replace the windows on the northeast side of the facility with wind resistant glass.

Structural Projects

Structural projects directly protect people and property at risk. They are called “structural” because they involve construction of manmade structures to control hazards. Some examples of structural projects are dams, reservoirs, dikes, levees, seawalls, bulkheads, revetments, high flow diversions, spillways, buttresses, debris basins, detaining walls, channel modifications, storm sewers, elevated roadways, and debris basins.
Evaluate Alternative Hazard Mitigation Actions

One set of criteria that is used for screening planning decisions is identified by the acronym STAPLE(E).

- Social – Is the hazard mitigation strategy socially acceptable?
- Technical – Is the proposed action technically feasible, and cost effective, and does it provide the appropriate level of protection?
- Administrative – Does the community have the capability to implement the action, and is the lead agency capable of carrying out oversight of the project?
- Political – Is the hazard mitigation action politically acceptable?
- Legal – Does the community have the authority to implement the proposed action?
- Economic – Do the economic base, projected growth, and opportunity costs justify the hazard mitigation project? Benefit cost-analysis is a mathematical method for comparing costs to the benefits to the community of a hazard mitigation action. If the benefits are greater than the costs, the project is cost-effective. Comparing the ratios of benefits to costs for several hazard mitigation projects helps to identify those that offer the “greatest bang for the community’s buck.” Benefit-cost analysis gives decision makers an understandable way to explain and defend their decisions. For many grant programs, FEMA and the State will use benefit-cost analysis to determine whether a project is eligible. The community can save time and energy by limiting planning activities to projects that will be more likely to receive funding.
- Environmental – Does the proposed action meet statutory considerations and public desire for sustainable and environmentally healthy communities?

Step 3: Prepare Implementation Strategy

There will be a variety of hazard mitigation actions in the hazard mitigation strategy, and multiple ways to implement them.

- Some actions will be carried out by the public sector, and some through the private sector.
- Some actions will be accomplished pre-disaster and some will not be feasible until after a disaster when post-disaster funding sources are available.
- Some actions will be accomplished in the short term and others will require up to years to accomplish.

The implementation strategy is an essential part of the hazard mitigation plan. The implementation strategy identifies who is responsible for which actions, how the hazard mitigation actions will be funded, and when the actions are to be completed.
Lesson 4. Building and Implementing a Community Hazard Mitigation Plan

Identify Who Will Implement the Hazard Mitigation Actions

A good first step for assigning responsibility is to organize the actions. One way to do so is to use the hazard mitigation categories discussed under Step 2:

- Prevention.
- Property protection.
- Public education and awareness.
- Natural resources protection.
- Emergency services protection.
- Structural projects.

For each category, identify an organization that can logically be assigned to lead the effort to implement a specific action. For example, a dune restoration project can logically be assigned to the natural resources department.

Identify Sources of Funding and Technical Assistance

The capability assessment conducted earlier in the planning process identified the community’s current fiscal capabilities. The implementation strategy identifies how to achieve the hazard mitigation actions that the hazard mitigation planning team has selected as priorities to the community. This section will include some possible funding sources.

Local and State government:
- Year-end money.
- Post-disaster recovery.
- Capital improvement budget.
- Economic development funds.
- Staff time.

Private-sector:
- Time.
- Labor.
- Materials.
- Private grants.

Federal Government:
- FEMA Pre-Disaster Mitigation (PDM) Program.
- FEMA Flood Mitigation Assistance (FMA) Program.
- FEMA Hazard Mitigation Grant Program (HMGP), Small Business Administration (SBA) Disaster Loans, and FEMA Public Assistance, which will be addressed in Lesson 5.
- Other Federal agencies, such as Housing and Urban Development (HUD), Economic Development Agency (EDA), and the Environmental Protection Agency (EPA).
Identify Sources of Funding and Technical Assistance (Continued)

Two sources of hazard mitigation funding made available by FEMA “pre-disaster” are described below:

The **Pre-Disaster Mitigation (PDM) Program** created by the Disaster Mitigation Act of 2000 (DMA 2000) includes competitive grants for hazard mitigation planning and projects:

- Cost-share for this grant program is 25-percent local/State match required (up to 75-percent Federal funding).
- Potential for 10-percent local/State match and 90-percent Federal share for communities meeting criteria for small and impoverished communities.
- Eligible organizations include local communities (city, county, townships, municipalities), State agencies, Indian Tribes/organizations, Alaska native villages, and certain private nonprofit groups.
- Application is made through the State office, generally through the SHMO or the PDM coordinator.
- The program requires an approved local hazard mitigation plan prior to the approval of local hazard mitigation project grants.

The **Flood Mitigation Assistance (FMA) Program** is a much smaller grant program that provides funding to assist States and communities in implementing measures to reduce or eliminate long-term risk of flood damage to NFIP-insured buildings, manufactured homes, and other insurable structures under NFIP.

The goal of FMA is to reduce repetitive loss properties in communities. Repetitive loss properties have had paid losses over $1,000 on two or more occasions.

**Cost-share requirements:**

- FEMA may contribute up to 75 percent of the total eligible costs.
- At least 25 percent of the total eligible costs must be provided by non-Federal sources.
- Of this 25 percent, no more than half can be provided as in-kind contributions from third parties.

It is important to note that in the FMA program, the 25-percent match has to have at least half of the funding in cash. This requirement is different from the other program requirements.
Identify Sources of Funding and Technical Assistance (Continued)

Eligible FMA activities include:

- Project Grants - acquisition, elevation, relocation, dry floodproofing (nonresidential structures only) of insured structures.
- Planning Grants - a FEMA-approved Flood Mitigation Plan is required in order for a State or community to receive an FMA Project Grant.
- Technical Assistance Grants - given to the States to help applicants in developing their applications.

Identify When Actions Should Be Completed

For each hazard mitigation action decide a specific timeline for starting, when interim steps will be completed, and when the action will be fully implemented.

Step 4: Document the Hazard Mitigation Planning Process

Make Decisions About the Document

There are some decisions to make before putting the plan document together: How long should the plan be? How detailed? What is the schedule? Who should write it?

Write the Plan

Writing the hazard mitigation plan involves assembling information and write-ups from previous phases of the hazard mitigation planning process.

In order to comply with the DMA 2000, FEMA has put together specific, detailed guidance for writing hazard mitigation plans. This guidance is available to all local communities in the “Multihazard Mitigation Planning Guidance under the Disaster Mitigation Act of 2000.”
Implement the Plan and Monitor Progress

When the hazard mitigation plan is complete, it is time to gain the community’s support for implementing the mitigation strategy it describes. If the plan is never carried out, the risk to the community has not been reduced.

Adopt the Plan

When the plan is adopted by the governing body the authority of the plan to guide hazard mitigation initiatives in the community is achieved. In addition, adoption of the plan by the local governing body is a prerequisite that must be fulfilled before the plan can be reviewed by FEMA. Adoption demonstrates the community’s commitment to fulfilling the mitigation goals and objectives outlined in the plan. It legitimizes the plan and authorizes responsible agencies to execute their responsibilities.

Implement the Plan Recommendations

Citizens and officials, particularly those who participated in creating the plan, will expect to see the results of their hard work. The planning team has the responsibility to ensure that the plan recommendations are implemented on schedule and, over time, that mitigation actions are incorporated into the day-to-day operations of government agencies. This was the purpose of developing the implementation strategy and timeline in Step 3 of Building the Plan. It should include a process for monitoring and documenting the progress of implementing the plan’s recommendations.

Evaluate Planning Results

It is important to determine whether the planned course of action has had the desired effect. The organizations or people with duties identified in the mitigation strategy should be asked to submit progress reports on a periodic basis. If indicators of success are established (such as milestones met, budget, or simply moving forward) it simplifies the process of keeping the community informed about the progress and success of the hazard mitigation program.
Revise the Plan

The frequency of plan evaluation depends upon the speed and intensity at which changes are occurring in the community. Significant community growth and recent or frequent disaster events may render the risk assessment inaccurate and/or necessitate a revised hazard mitigation strategy. In any case, the DMA 2000 requires that local plans be updated every five years at a minimum.

When determining the extent of the update needed, some of the factors to consider are:

- If goals and objectives are still applicable.
- If the plan’s priorities still correspond with State priorities.
- If existing actions need to be reprioritized for implementation.
- If actions are appropriate for available resources.

The revised plan will again need to be reviewed for its validity, adopted by the governing body, and any new initiatives implemented.

FEMA 396-4, “Bringing the Plan to Life” contains detailed guidance on implementing the hazard mitigation plan.
This lesson has covered the requirements and resources for developing and implementing the hazard mitigation plan.

The lesson has described methods for establishing hazard mitigation goals and objectives for the community, and evaluating and prioritizing potential hazard mitigation actions to reduce future losses. Developing a hazard mitigation plan is a multi-step process, during which it is important to keep everyone informed of the progress, solicit public input, and address all of the important hazard-related goals to end up with a plan that is consistent with the provisions of DMA 2000.

Lesson 4 covered the third phase of hazard mitigation planning: Develop a Mitigation Plan. For information on accomplishing the steps of this phase, refer to the FEMA publication 386-3, “Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies.”

Lesson 4 also addressed the fourth phase of planning: Implement the Plan and Monitor Progress. FEMA publication 386-4, “Bringing the Plan to Life: Implementing the Hazard Mitigation Plan,” can provide information that will help you build the implementation strategy.

In the next lesson, we will discuss community hazard mitigation in the post-disaster environment.
Select one high-priority hazard risk in your community (based on the Hazard Mitigation in Your Community activity from Lesson 3).

Identify one hazard mitigation action to reduce the risk of future damages from that hazard for each of the following hazard mitigation categories.

**Prevention:**

**Property protection:**

**Public education and awareness:**

**Natural resource protection:**

**Emergency services protection:**

**Structural projects:**
Lesson 4. Building and Implementing a Community Hazard Mitigation Plan

Test Yourself

1. The __________________________ provides direction for the community’s efforts to reduce the potential losses identified in the risk assessment.

2. __________ are general guidelines for what you want to achieve in the long run.

3. It is important that __________________ be measurable so you will know when you have successfully implemented the mitigation strategy.

4. Planning, zoning, and open-space preservation (parks and recreation areas) are examples of hazard mitigation actions in the _________________ category.

5. Floodproofing and acquisition are examples of hazard mitigation action in the __________________________ category.

6. Notices to residents of a hazard-prone area and displays of mitigation techniques are examples of hazard mitigation actions in the __________________________ category.

7. Wetlands protection and dune restoration are examples of hazard mitigation actions in the _________________ category.

8. Dikes, levees, and seawalls are examples of ________________ mitigation actions.

9. An acronym for a set of criteria used to screen planning decisions is ________________.

10. FEMA’s __________________________ Program includes competitive grants for hazard mitigation planning and projects.
Lesson 5. After a Disaster: Recovery and Hazard Mitigation Programs

Introduction

The previous four lessons focused on pre-disaster mitigation: developing a program, and writing and implementing a hazard mitigation plan. The Disaster Mitigation Act of 2000 (DMA 2000) encourages these activities so that communities will reduce risks to the extent possible prior to hazard events.

This lesson focuses on the post-disaster environment. When a disaster occurs there are other opportunities to mitigate hazard risks, particularly if your community has a FEMA-approved or approvable hazard mitigation plan, and is ready to implement some or all of the actions in the hazard mitigation strategy. Your community’s hazard mitigation plan may identify post-disaster resources to fund certain mitigation activities. It is important for communities to be aware of the roles of Federal, State, and local governments in disaster recovery, and the resources available for local hazard mitigation after a Presidential disaster declaration.

Disaster Declaration Process

After a hazard event, the local government responds, supplemented by neighboring communities and volunteer agencies. If overwhelmed, the local government turns to the State for assistance.

The State responds with State resources, such as the National Guard and State agencies. Local, State, Federal, and volunteer organizations conduct damage assessments to determine losses and recovery needs. If appropriate, the Governor submits to FEMA a request for a major disaster declaration. This request usually is based on the damage assessment, and is accompanied by the commitment of the Governor to devote State funds and resources to the long-term recovery. (A disaster declaration request is sometimes submitted when a hazard event, such as a catastrophic hurricane, is imminent and the local and State resources are anticipated to be overwhelmed.)

FEMA evaluates the request and recommends action to the White House based on the disaster and the State’s ability to recover. The President approves the request, or FEMA informs the Governor it has been denied. This decision process could take a few hours or several weeks, depending on the nature of the disaster.

Introduction to Hazard Mitigation
Disaster Assistance

The Stafford Act authorizes the President to declare that a major disaster or emergency exists. This “declaration” is the key to making available an array of Federal disaster assistance programs to State and local governments and individuals.

Public Assistance

Under Section 406 of the Stafford Act, the President may authorize funds to State or local government for repair, restoration or replacement of a public facility damaged or destroyed by a major disaster. Generally, Public Assistance programs pay for 75 percent of the approved project costs. Public Assistance may include debris removal, emergency protective measures and public services, repair of damaged public property, loans needed by communities for essential government functions, and grants for public schools.

Section 406 also authorizes funds for hazard mitigation measures that the State or local government determines to be necessary to meet the need for government services and functions in areas affected by the disaster.

Individual Assistance

Under Section 408 of the Stafford Act, temporary housing may be available for up to 18 months (using local resources) for displaced persons whose residences were heavily damaged or destroyed. Funding also can be provided for housing repairs and replacement of damaged items to make homes habitable.

Section 408 authorizes the provision of financial assistance to help meet other serious disaster-related needs and necessary expenses not covered by insurance and other aid programs. These may include replacement of personal property, and transportation, medical, dental, and funeral expenses.

U.S. Small Business Administration (SBA) Loans

Low-interest disaster loans are available after a disaster for homeowners and renters from the SBA to cover uninsured property losses. Loans may be used for repair or replacement of homes, automobiles, clothing, or other damaged personal property. Loans are also available to businesses for property loss and economic injury.

Additional disaster loan amounts, up to 20 percent, may be requested by business owners and homeowners to help pay for hazard mitigation actions that can be incorporated during the repair or rebuilding process.
Disaster Assistance (Continued)

Hazard Mitigation Grant Program (HMGP)

The HMGP is authorized under Section 404 of the Stafford Act, and is the main post-disaster hazard mitigation program. It provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The HMGP is intended to reduce the loss of life and property due to natural disasters and to enable hazard mitigation measures to be implemented during the immediate recovery from a disaster.

The amount of funding available for the HMGP is calculated from the total Individual Assistance plus Public Assistance amounts minus administrative costs. If the State has an approved Hazard Mitigation Plan, the HMPG amount may be as much as 7.5 percent of the total FEMA disaster assistance to the State. Local communities with FEMA-approved hazard mitigation plans submit applications for grants to fund projects that have been identified in their hazard mitigation strategy. Under the DMA 2000 planning regulations, consistency between the HMGP project application and the approved hazard mitigation plan is crucial.

FEMA can fund up to 75 percent of the eligible costs for each project. The State or grantee must provide a 25-percent match, which can be from cash and/or in-kind sources.

Some examples of eligible HMGP activities include:

- Acquisitions of hazard-prone property.
- Building elevations.
- Drainage upgrades.
- Education and training.
- Engineering studies.
- Flood proofing.
- Land-use planning.
- Seismic retrofits.
- Slope stabilization.
- Storm shutters.
- Window film.
- Zoning and building code ordinance development/strengthening.

To be funded, HMGP projects must be cost effective, a permanent or long-term solution, environmentally sound, and consistent with state and local hazard mitigation plan strategies.
National Flood Insurance Program (NFIP)

Communities that participate in the NFIP have floodplain ordinances that require that all insured structures damaged over 50 percent of the market value of the property must comply with the floodplain ordinance when the building is repaired. That could mean elevation, acquisition and demolition, or relocation to a location out of the floodplain.

If the disaster is a flooding event, and the insured structure is located in a floodplain identified on a Flood Insurance Rate Map (FIRM), the NFIP policy holder may be eligible for Increased Cost of Compliance funds up to a maximum of $30,000. These funds are to be used to mitigate the risk of future flooding, and to assist the building owner with the cost of such an endeavor.

Technical Assistance

In addition to funding resources, both the State and FEMA offer technical assistance to local communities, as needed. If not readily available, contact the State Hazard Mitigation Officer for guidance on technical assistance available from Federal and State agencies.

Post-Disaster Hazard Mitigation Opportunities

After disaster damage has occurred, the subsequent uncertainty about how to recover provides unique opportunities for educating the disaster-affected public about hazard mitigation. Check to see if any of the home improvement stores are sponsoring hazard mitigation clinics to assist property owners with their projects. Other technical assistance is available from the State and from the agency representatives in Disaster Recovery Centers.
FEMA Hazard Mitigation Disaster Operations

FEMA recognizes that there are extraordinary opportunities for hazard mitigation post disaster. Under the National Response Plan, Hazard Mitigation is one of the branches in the Operations Section, along with Public Assistance and Individual Assistance.

The mission of FEMA Hazard Mitigation is to protect lives and prevent or reduce the loss of property from hazard events. Post-disaster, this mission is accomplished through comprehensive efforts authorized by the Stafford Act as amended by the Disaster Mitigation Act of 2000, the National Flood Insurance Act, the Flood Insurance Reform Act, and Executive Orders. FEMA Hazard Mitigation staff partner with State, local, and Tribal governments to accomplish the following objectives:

- Assess the factors that contributed to disaster effects.
- Identify hazards.
- Identify structures, population, and special features for risk assessment.
- Identify risk reduction opportunities.
- Develop and implement hazard mitigation strategies.
- Educate the public in methods to reduce future risks.
- Promote hazard mitigation planning and project development that will result in sustainable community development.
- Provide grants to fund hazard mitigation projects.
- Assist communities in post-disaster administration and marketing of the National Flood Insurance Program (NFIP).
- Assess the performance of ongoing hazard mitigation activities.
- Identify and document proven mitigation actions and/or projects.
- Quantify the benefits of hazard mitigation.

These objectives are carried out by Hazard Mitigation Branch staff working in the Branch Management unit or in one of four functional groups:
Disaster Assistance (Continued)

Hazards and Performance Analysis (HPA)

- Collects critical information on the disaster affects using such resources as FEMA’s Mitigation Assessment Team (MAT) Program. MATs use the data to increase damage resistance through improvements in construction codes and standards, designs, methods, and materials used for new construction and post-disaster repair and recovery. MAT reports are found can be found at http://www.fema.gov/fima/mat/mat_rpt.shtm.
- If applicable, identifies what mitigation actions can be implemented to prevent or reduce such damages in the future and coordinates with the other Hazard Mitigation functional groups to disseminate the information as needed and in a form useful to individuals, businesses, building professionals, local and state governments who need it.
- Provides technical assistance using tools such as GIS and HAZUS, discussed in Lesson 3, to assist in developing hazard mitigation strategies. These strategies may be implemented using hazard mitigation funding that becomes available post-disaster, such as HMGP, Public Assistance, SBA disaster loans.

Hazard Mitigation Grants and Planning

- Provides technical assistance to implement the HMGP in support of the State’s hazard mitigation priorities.
- Provides assistance to local and State entities in developing or revising multi-hazard mitigation plans, and utilizing hazard mitigation funding to reduce the loss of life and property from future hazard events.
- Supports local and State compliance with the laws, regulations, and guidance of Section 404 of the Stafford Act (HMGP) and Section 322 of the Disaster Mitigation Act. (Mitigation Planning).

National Flood Insurance Program (NFIP) and Insurance

- Serves as the point of coordination and resource on all hazards insurance for all components of FEMA and other Federal agencies.
- Assists FEMA Hazard Mitigation Advisors working with the public in Disaster Recovery Centers.
- Promotes community participation in the NFIP.
- Ensures compliance with NFIP floodplain management regulations in disaster recovery.
Community Education and Outreach (CEO)

- Provides advice to the public and disaster assistance applicants on hazard mitigation techniques and insurance through Disaster Recovery Centers (DRCs), other disaster assistance facilities, and special events.
- In coordination with Community Relations, voluntary agencies (VOLAGs), and the State, develops and implements public education strategies to encourage communities to become more disaster resistant through hazard mitigation action in the pre- as well as the post-disaster time frames.
- Produces educational materials, brochures, displays, and fact sheets on hazard mitigation topics relevant to the disaster.
- In partnership with External Affairs, identifies, documents, and disseminates Best Practices, which illustrate reduced damage and/or injuries and reduced disaster recovery costs associated with hazard mitigation actions.

Summary

Federal, State, and local governments all play important roles in disaster response and recovery. While there are several programs that can help communities recover and reduce hazard risks after a disaster, these programs cannot rebuild all that is lost during a disaster. Communities and individuals can help themselves before disasters by reducing their risks of damages, and using hazard mitigation measures to protect themselves and their property.
Hazard Mitigation in Your Community

Identify at least one source of post-disaster funding for one of the local hazard mitigation actions you listed in the Hazard Mitigation in Your Community activity in Lesson 4.
Lesson 5. After a Disaster: Recovery and Hazard Mitigation Programs

Test Yourself

1. When a State’s resources are overwhelmed by a disaster event, the ______________ submits a request for a major disaster declaration to __________.

2. The ______________ Act authorizes the President to declare that a major disaster or emergency exists.

3. Section ______ of the Stafford Act authorizes funds for hazard mitigation measures to meet the need for government services and infrastructure in areas affected by the disaster.

4. Section ______ of the Stafford Act authorizes temporary housing for up to 18 months for displaced persons whose primary residences were heavily damaged or destroyed.

5. The ______________________________ is authorized under Section 404 of the Stafford Act and is the main post-disaster hazard mitigation program.

6. In order for the State and its local jurisdictions to be eligible for Hazard Mitigation Grant Program funds, the State must have a FEMA-approved _____________________.

7. A National Flood Insurance Program (NFIP) policy holder may be eligible for ____________________ funds to mitigate the risk of future flooding if the structure is located in a Special Flood Hazard Area (SFHA) and is more than 50 percent damaged.

8. The __________________________ may make available additional disaster loan amounts, up to 20 percent, to help pay for hazard mitigation actions.

9. The __________________________ group in the Hazard Mitigation Branch uses Mitigation Assessment Teams (MATs) to collect critical information on disaster effects.

10. The ________________________ group in the Hazard Mitigation Branch provides advice to the public on hazard mitigation techniques and insurance at the Disaster Recovery Centers.
Glossary

Applicant - State agency, local government, or any political subdivision of the State, including Indian tribes and Alaskan native villages, that applies for FEMA post-disaster assistance. Also, private nonprofit organizations that include medical, emergency (fire and rescue), utility, educational, custodial care, zoos, community centers, libraries, homeless shelters, senior citizens centers, and sheltered workshops.

Community Hazard Mitigation Planning Team - A local hazard mitigation planning team composed of government and private-sector individuals with a variety of skills and areas of expertise, usually appointed by the city or town manager, or chief elected official. The group uses these skills to find solutions to community hazard mitigation needs and gain community acceptance of those plans.

Community Rating System (CRS) - An NFIP program that provides incentives for NFIP communities to complete activities that reduce flood hazard risk. The insurance premiums of these communities are reduced when the community completes specified activities.

Declaration - Presidential finding that a jurisdiction of the United States may receive Federal aid as a result of damages from a major disaster or emergency.

Department of Homeland Security (DHS) – A cabinet-level department established in 2002 by merging 22 separate agencies into a cohesive department with a primary mission of protecting the homeland.

Disaster Mitigation Act 2000 (DMA 2000) - Amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). The purpose of DMA 2000 is to reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs.

Disaster-Resistant Communities Initiative - A community-based initiative that seeks to reduce vulnerability to natural hazards for the entire designated area through hazard mitigation actions. This approach requires cooperation between individuals and the business sectors of a community to implement effective hazard mitigation strategies.

Emergency - Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, explosion, or other catastrophe in any part of the United States that requires Federal emergency assistance to supplement State and local efforts to save lives and protect property, public health, and safety, or to avert or lessen the threat of a disaster. Defined in Title V of Public Law 93-288, Section 102(1).
Existing Construction - As used in reference to the NFIP, any structure already existing or on which construction or substantial improvement was started prior to the effective date of a community's floodplain management regulations.

Federal Emergency Management Agency (FEMA) - The lead Federal agency with responsibility for responding to Presidential emergencies and major disasters. FEMA’s mission is to reduce loss of life and property and protect our Nation’s critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of hazard mitigation, preparedness, response, and recovery.

Flood Insurance Rate Maps (FIRMS) - The official map of a community prepared by FEMA, showing base flood elevations along with the special hazard areas and the risk premium zones.

Flood Mitigation Assistance Program (FMA) - Provides pre-disaster grants to State and local governments for both planning and implementation of hazard mitigation strategies. Each State is awarded a minimum level of funding that may be increased depending upon the number of NFIP policies in force and repetitive claims paid. Grant funds are made available from NFIP insurance premiums, and therefore are only available to communities participating in the NFIP.

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

Hazard Mitigation Grant Program (HMGP) - Authorized under Section 404 of the Stafford Act; provides funding for cost-effective hazard mitigation projects in conformance with the post-disaster hazard mitigation plan required under Section 409 of the Stafford Act.

Hazard Mitigation Plan - The plan resulting from a systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards present in society that includes the actions needed to minimize future vulnerability to hazards.

HAZUS-MH - FEMA’s software program for estimating potential losses from disasters.

Human Services - Supplementary Federal assistance provided under the Stafford Act to individuals and families adversely affected by a major disaster or emergency. Also known as Individual Assistance, Temporary Housing Assistance, Unemployment Assistance, and Individual and Family grants.
**Infrastructure Support** - Federal financial assistance provided under the Stafford Act to State and local governments or to eligible private nonprofit organizations for disaster-related requirements. Also known as Public Assistance (PA).

**Major Disaster** - Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, explosion, or other catastrophe in any part of the United States that, in the determination of the President, causes damage of sufficient severity and magnitude to warrant major disaster assistance under the Stafford Act, above and beyond emergency services by the Federal Government, to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby defined under Public Law 93-288.

**Mitigation Assessment Team (MAT) Program** - works to increase damage resistance through improvements in construction codes and standards, designs, methods, and materials used for new construction and post-disaster repair and recovery.

**National Earthquake Hazards Reduction Program (NEHRP)** - the Federal Government's program to reduce the risks to life and property from earthquakes. The NEHRP agencies are FEMA, The National Institute of Standards and Technology (NIST), the lead agency; the National Science Foundation (NSF); and the United States Geological Survey (USGS).

**National Flood Insurance Program (NFIP)** - Provides the availability of flood insurance in exchange for the adoption and enforcement of a minimum local floodplain management ordinance. The ordinance regulates new and substantially damaged or improved development in identified flood hazard areas.

**Pre-Disaster Mitigation (PDM)** – created by the Disaster Mitigation Act of 2000 (DMA 2000) includes competitive grants for hazard mitigation planning and projects.

**Preparedness** - Activities to ensure that people are ready for a disaster and respond to it effectively. Preparedness requires figuring out what will be done if essential services break down, developing a plan for contingencies, and practicing the plan.

**Recovery** - Activities necessary to rebuild after a disaster. Recovery activities include rebuilding homes, businesses, and public facilities; clearing debris; repairing roads and bridges; and restoring water, sewer, and other essential services.
**Response** - Activities to address the immediate and short-term effects of an emergency or disaster. Response activities include immediate actions to save lives, protect property, and meet basic human needs.

**Section 404 of the Stafford Act** - Authorizes the Hazard Mitigation Grant Program, which provides funding for cost-effective hazard mitigation measures.

**Section 409 Hazard Mitigation Plan** - Requires the identification and evaluation of mitigation opportunities, and that all repairs be made to applicable codes and standards, as a condition for receiving Federal disaster assistance. Enacted to encourage identification and mitigation of hazards at all levels of government.

**Stafford Act** - Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law November 23, 1988; amended the Disaster Relief Act of 1974, PL 93-288. The statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and FEMA programs.

**STAPLE(E)** - An acronym for the criteria that can be used by a community in selecting an appropriate mitigation strategy: Social, Technical, Administrative, Political, Legal, and Economic/Environmental.

**State Hazard Mitigation Officer (SHMO)** - 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.
Resources

FEMA Training information - [http://training.fema.gov/emiweb/is/](http://training.fema.gov/emiweb/is/)

44 CFR Parts 201 and 206, Hazard Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule.

Disaster Mitigation Act of 2000.

Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities, the Multihazard Mitigation Council (MMC) of the National Institute of Building Sciences (NIBS) [http://www.nibs.org/MMC/MitigationSavingsReport/natural_hazard_mitigation_saves.htm](http://www.nibs.org/MMC/MitigationSavingsReport/natural_hazard_mitigation_saves.htm)


Many FEMA publications are available in the Library on [http://fema.gov](http://fema.gov), and are available through: FEMA’s Publication Warehouse at 800-480-2520

FEMA “Getting Started: Building Support for Mitigation Planning.” FEMA publication 386-1


FEMA, “Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies.” FEMA publication 386-3

FEMA, “Bringing the Plan to Life: Implementing the Hazard Mitigation Plan,” FEMA publication 386-4

FEMA, “Disaster Mitigation: Publications, Workshops and Planning Tools.” (Brochure)

FEMA, “Help After a Disaster: Applicant’s Guide to the Individuals and Households Program.”

FEMA, “Multi-Hazard Mitigation Planning Guidance.”