

HAZARD MITIGATION PLANNING MADE EASY!

A Simple and Easy Way to Develop Your Community's Hazard Mitigation Plan

Over the next couple of days you will be learning about a local planning process called **HAZARD MITIGATION PLANNING**. Before this training program is over you will be well on your way to developing a **HAZARD MITIGATION PLAN** for your local community. That plan if properly implemented and followed may someday save the lives, property and livelihoods of your friends, neighbors, family, perhaps even yourself. Hazard mitigation planning may sound complicated, confusing and maybe even intimidating. It's really not.

The first time people hear the term "hazard mitigation," many of them say "What's that?" Most people have an idea of what "hazards" are. Hazards are dangers or things to watch out for or risks, but what's mitigation mean? The ancient Romans used the word "*mitigare*" meaning "to soften." Good old Daniel Webster says it means "to make less severe or painful, to cause to become less harsh or hostile." Mitigate is another way to say "relieve" or "alleviate." Hazard mitigation is kind of like taking an aspirin to make a headache go away, it might not make it go away completely but it should help some. That's the general idea, to make a dangerous situation less risky, but now let's get down to what Hazard Mitigation is really all about.

Great! You're probably thinking, now I know what the Romans and Daniel Webster meant, what should **HAZARD MITIGATION** mean to me? For our purposes hazards are natural, man-made or technological disasters. Hazard mitigation means reducing, eliminating, redirecting, or avoiding the effects of those hazards. The standard definition of hazard mitigation that is often used by FEMA and PEMA is:

Any cost-effective action taken to eliminate or reduce the long-term risk to life and property from natural and technological hazards.

The phrase "cost-effective" is added to this definition to stress the important practical idea that, to be beneficial, a mitigation measure should save you (the American taxpayer) money in the long run. For example, in the California earthquakes when expressways and bridges collapsed, which was more cost-effective? Rebuild structures to the same standard they were before the quakes or spend a little additional money to build stronger, more earthquake-resistant structures? The second choice probably makes more sense. On the other hand, California probably doesn't need to spend a lot of money to flood-proof homes in, let's say, Death Valley. A more appropriate, cost-effective mitigation there might be against drought and extreme heat hazards.

OK, that's hazard mitigation, now what's a Hazard Mitigation Plan, since that's what this course is supposed to be about?

Wow! You're just raring to go! Well, a Hazard Mitigation Plan, then, is:

A community's outline for evaluating hazards, identifying resources and capabilities, selecting appropriate actions, and developing and implementing mitigation measures to eliminate or reduce future damage from those hazards in order to protect the health, safety, and welfare of residents in that community.

Wait, that still sounds complicated, confusing and maybe even intimidating, doesn't it? Let's break it down into smaller, more manageable parts. It looks like there are four parts to our definition of a Hazard Mitigation Plan:

- Evaluating and prioritizing hazards
- Identifying resources and capabilities
- Selecting appropriate actions
- Developing and implementing mitigation measures

The purpose of this course over the next several days is to explain and discuss each of these four parts and to give each course participant the opportunity to develop a working knowledge of each. The first three steps lead up to the fourth and final part, "Developing & Implementing Mitigation Measures," in which you actually begin to develop a Hazard Mitigation Plan for your local community using the principles and skills learned in this course.

So enough already with the preliminaries and the formalities! Let's get down to the serious business of doing our best to protect our families and communities from the next, sure-to-come, life-threatening disaster through Hazard Mitigation Planning.

HAZARD MITIGATION PLANNING MADE **EASY!**

PART ONE: HAZARD EVALUATION

Earlier we said that hazards could be natural, man-made or technological. Most of our focus in this program will be on natural hazards in Pennsylvania. Remember, however, there are significant man-made and technological threats (like chemical spills, nuclear accidents, even, unfortunately in today's world, terrorist attacks) that you should consider and include in your hazard mitigation plan if they present a significant risk to your community.

The first step in developing a Hazard Mitigation Plan is determining what hazards threaten your community. To do that you need to be able to answer several questions about those hazards and about your community. The first question is simple enough:

What hazards are you and your community most worried about?

In Pennsylvania's State Hazard Mitigation Plan seven natural hazards are identified: floods, tornadoes, earthquakes, drought, winter storms, wildfire and landslides. Some or all of these natural hazards are probably the risks you and your community are most concerned about. Man-made (technological) hazards from nuclear power plants, chemical production companies, and hazardous material spills are also real risks for many of Pennsylvania's communities. Another unfortunate but growing concern comes from societal hazards. Terrorist attacks, mass shootings and hostage situations are all potential threats to our communities where mitigation may be an effective tool to reduce risks.

Exercise #1: Hazard Identification

Make a list of all the hazards you can think of that could really threaten your community.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____

With a little thought, coming up with a list of the hazards that your community faces is pretty easy. But that's just the beginning of Hazard Evaluation. If you are going to be able to effectively "soften" the next hazard that threatens your community, there are a lot more questions to answer. What hazards do you face the most often? What ones are the most severe? What ones cause the most damage? What ones affect the most people? The largest area? What ones are the most costly to businesses and the local economy? Emergency management specialists call this step **Hazard Vulnerability Analysis**.

HAZARD MITIGATION PLANNING

PART TWO: HAZARD EXPOSURE PROFILE

Before looking at the various hazards your community faces, it is important to first look at the make-up of your community itself. The reason for this is to determine just what is potentially at risk in your community should a disaster occur. This basic information will be helpful in evaluating the consequences of different types of disasters as you develop a hazard priority list for your hazard mitigation plan.

What is potentially at risk in your community should a disaster occur?

Let' call this summary information your community's "HAZARD EXPOSURE PROFILE."

In 1995 the Federal Emergency Management Agency (FEMA) developed a hazard exposure index for just about every county in the United States. To do this, data about fourteen (14) different parts of each community was collected. To determine the hazard exposure of your community, these fourteen items are a good place to start. You can add or delete any categories to get the best picture of your community.

EXERCISE #2: Exposure Identification

Name of Municipality/County _____ AREA _____ square miles

Population _____

Public Water Supplies (#)

Sewage Treatment Sites (#)

Miles of Roads/Streets _____

Miles of Railroad _____

Miles of Pipeline _____

Miles of Utility Lines _____

Airports (#) _____

Hospitals (#) _____

Bridges (#) _____

Dams (#) _____

Toxic/Chemical Inventory Sites (#) _____

Superfund Sites (#) _____

Nuclear Power plants (distance to) _____

HERE ARE SOME OTHER CONSIDERATIONS YOU MIGHT WANT TO LOOK AT IN YOUR COMMUNITY TO ASSESS YOUR HAZARD EXPOSURE:

HAZARD EXPOSURE

What is at risk when disaster strikes your community?




- Hazards affect people, homes and businesses, critical facilities, transportation routes, utilities and services, water supplies, and the environment.
- THE FIRST RULE:
“KNOW THY COMMUNITY”


HAZARDS AFFECT PEOPLE

What is your community’s population like?

- Population size
- Age and gender
- Children at home & school
- Seniors & special needs people
- Population density: urban & rural
- Workforce in your community
- Workforce outside the community
- Proximity to hazard risk areas:
 - Nuclear plants
 - Chemical storage plants
 - Rivers & dams



HAZARDS AFFECT HOMES & BUSINESSES



- What businesses are in your area?
- What is the size of the workforce?
- What are the largest & most critical?
- How do people get to work?
- What utilities & services are needed?
- What happens if a business closes?
- What on the job hazard risks exist?
- What is their proximity to risk areas?
- What is your housing inventory?
Number of units, building type, method of construction, location

CRITICAL FACILITIES INVENTORY

- Hospitals & Healthcare
- Schools & Day Cares
- Emergency Shelters
- Utilities & Services
- Communications
- Emergency Services
- Government Services
- Transportation



These are just some ideas about the basic community information you might want to collect to get an accurate picture of what is potentially at risk during a disaster. The better, more complete understanding of your community you have at the outset, the more detailed and accurate your hazard mitigation plan is likely to be. It will also make it easier for you to answer some of the questions mentioned earlier: What disasters cause the most damage? What ones affect the most people? The largest area? What ones are the most costly to businesses and the local economy? This is the heart of hazard vulnerability analysis and where we are going next in this training course.

Hazard Mitigation Planning

PART THREE: HAZARD VULNERABILITY ANALYSIS (HVA)

Let's stop for a moment and recap. We've listed the various hazards that could hit your community and we have taken the time to get a good idea of what is at risk in your community. Now in the next step of developing a local hazard mitigation plan, Hazard Vulnerability Analysis (HVA for short), we are going to determine what hazards pose the greatest threat to your community.

KEY TERMS

HAZARD VULNERABILITY ANALYSIS

The process of evaluating risk associated with a specific hazard and defined in terms of probability and frequency of occurrence, magnitude and severity, exposure and consequences.

There are a number of ways to go about an HVA, from the latest high-tech, computer-based modeling method to good, old-fashioned pencil pushing and head scratching. Regardless of what method you have at your disposal, the basic elements are the same. The end result is a method that permits decision-makers to anticipate losses, evaluate potential impacts, and facilitate effective emergency planning and hazard risk management.

Defining a hazard in terms of probability and frequency of occurrence simply means, how often is such an event likely to happen? In the case of commonly occurring natural disasters (floods, winter storms) it is pretty easy to document a past history through local news accounts, official records and local personal experiences. Technological hazards and accidents (nuclear or chemical) are carefully monitored and regulated by law and can be tracked through the mandated reporting requirements of those laws. Some serious hazards (earthquake) that could pose devastating consequences to a highly developed and populated area may not have occurred in recent memory. In those cases you may have to rely on expert or statistical projections of likelihood and severity.

After determining how often a hazard event happens, measuring its magnitude and severity is the next important consideration in your local HVA. Magnitude is the strength or destructive power of a disaster. Severity is a measure of an event's duration and impact area. These two measurements go hand-in-hand with frequency and probability in identifying the order of risk to your community. Let's take a few minutes to look more closely at this relationship by way of a couple of examples.

Winter storms are a common occurrence in Pennsylvania. Can you imagine a PA winter without one? The chance (or probability) of a snowfall of at least 1" during the course of a winter is pretty high, say 100%? The number of times (frequency) when we get at least 1" of snow in one winter might be 20 days. The strength (magnitude) and severity (duration and area) of such a storm, however, is very small. How great is the hazard from such an event?
In Pennsylvania, are you kidding?

Actually, such an event without mitigation could pose a significant risk to a community (One PEMA staffer saw an entire military base in Texas closed by 1" of snow and sleet). In fact, an event of this scope is not a significant risk in Pennsylvania because we have done things to mitigate against its damaging and disruptive effects. Snow tires and experience driving in snow, cinder and plow-truck fleets, full basements, home insulation and heating, even winter clothing: All these factors actually mitigate to "soften" the effects of such a storm.

More snow! This time, however, the accumulation is significantly higher—say, 3 feet. The chance (probability) of a snowfall that deep is much lower than our earlier 1" snow. The frequency of such an accumulation may be only once or twice in a single winter. Additionally, let's say this storm also has high winds and extreme cold associated with it. How great is the hazard from such an event?

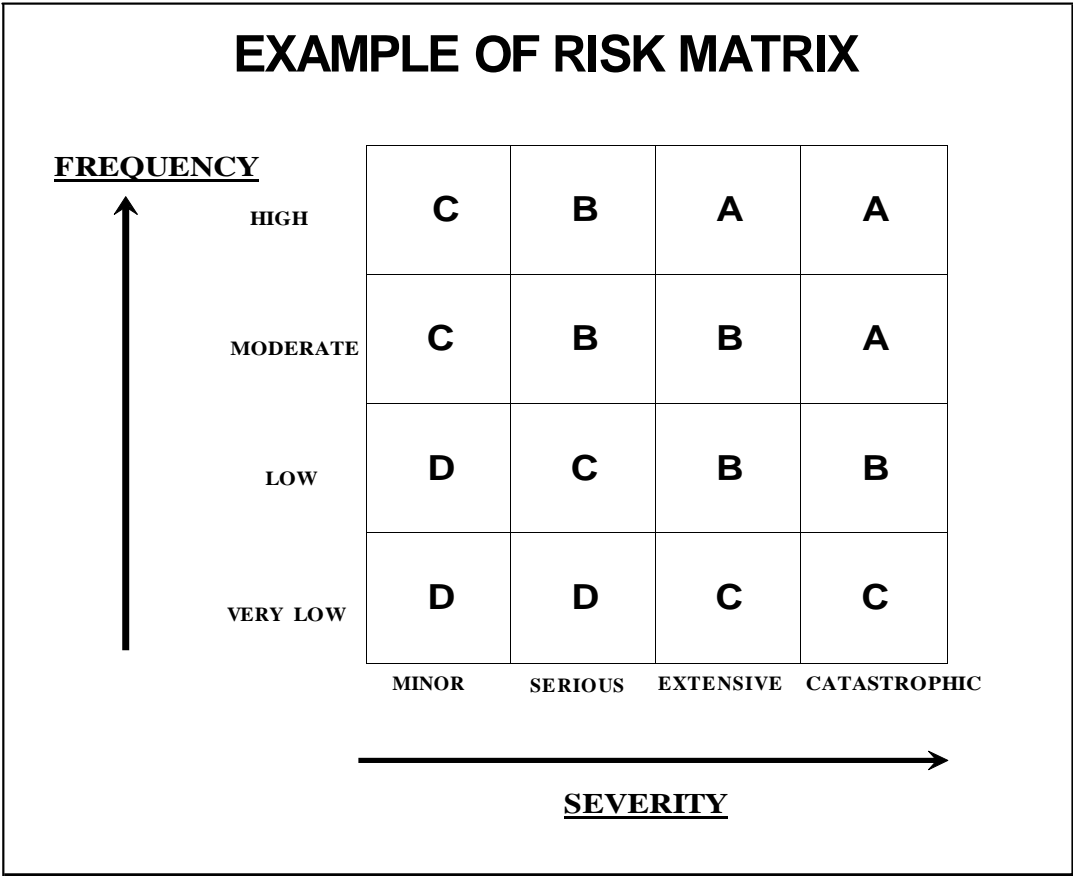
Although its occurrence is less frequent, because of the greater magnitude and severity of this storm (blizzard) the risk of adverse consequences is much higher. In terms of Hazard Vulnerability Analysis (HVA), such a level of threat could be considered significant in developing a hazard mitigation plan.

As was mentioned earlier, there are a number of ways to assess these different hazard elements in determining risk to your community. Computer-based geographic information system (GIS) models like FEMA's HAZUS program utilize many different kinds and sources of information to project potential losses from various types and intensities of disasters. If you have the resources and manpower, this method is a powerful tool in HVA and has many advantages. A simpler method that is available to anyone interested in HVA and willing to devote some time and mental energy to the task is **RISK MATRIX ANALYSIS**.

RISK MATRIX

- Ⓢ Predicated on Frequency and Severity
- Ⓢ Gives Qualitative Measure that Permits the Prioritization of Risk Among Multiple Hazards

THE RISK MATRIX METHOD enables hazard mitigation planners to classify various types of hazards into different categories of priority by locating them on a two-dimensional grid based on their frequency and severity. The risk matrix looks like this:



RISK FREQUENCY

- Ⓢ High Frequency: events that occur more frequently than once in 10 years
- Ⓢ Moderate Frequency: events that occur from once in 10 years to once in 100 years
- Ⓢ Low Frequency: events that occur from once in 100 years to once in 1,000 years
- Ⓢ Very Low Frequency: events that occur less frequently than once in 1,000 years

SEVERITY CATEGORIES

- Ⓢ Based on Potential, Rated From Catastrophic to Minor
- Ⓢ Fatalities
- Ⓢ Injuries
- Ⓢ Property Damage
- Ⓢ Business Interruption
- Ⓢ Environmental/Economic Impact

RISK CATEGORIES

- Ⓢ Class A: High-risk condition with the highest priority for mitigation and contingency planning (immediate action)
- Ⓢ Example of Losses: Death of fatal injury, complete shutdown of facilities and critical services for more than 30 days, more than 50% of property located in affected area is severely damaged.

RISK CATEGORIES (Continued)

- Ⓢ Class B: Moderate-to-high-risk condition with risk addressed by mitigation and contingency planning (prompt action).
- Ⓢ Examples: Permanent disability, severe injury/illness, complete shutdown of facilities and critical services for more than 14 days, more than 25% of property in affected area is severely damaged.

RISK CATEGORIES (Continued)

- Ⓢ Class C: Risk condition sufficiently high to give consideration for further mitigation and planning.
- Ⓢ Examples: Injury or illness not resulting in disability, complete shutdown of facilities and critical services for more than 7 days, more than 10% of property located in affected area is severely damaged.

RISK CATEGORIES (Continued)

- Ⓢ Class D: Low-risk condition with additional mitigation contingency planning (advisory in nature).
- Ⓢ Examples: Treatable first aid injury, complete shutdown of facilities and critical services for more than 1 day, no more than 1% of property located in affected area is severely damaged.

It should be pointed out that frequency and severity are relative terms and that you can adopt your own criteria for each level or perhaps include more risk classes. Whatever you decide, your risk matrix should include the full range of possible hazard situations your community must consider and define clear parameters for each class of risk condition.

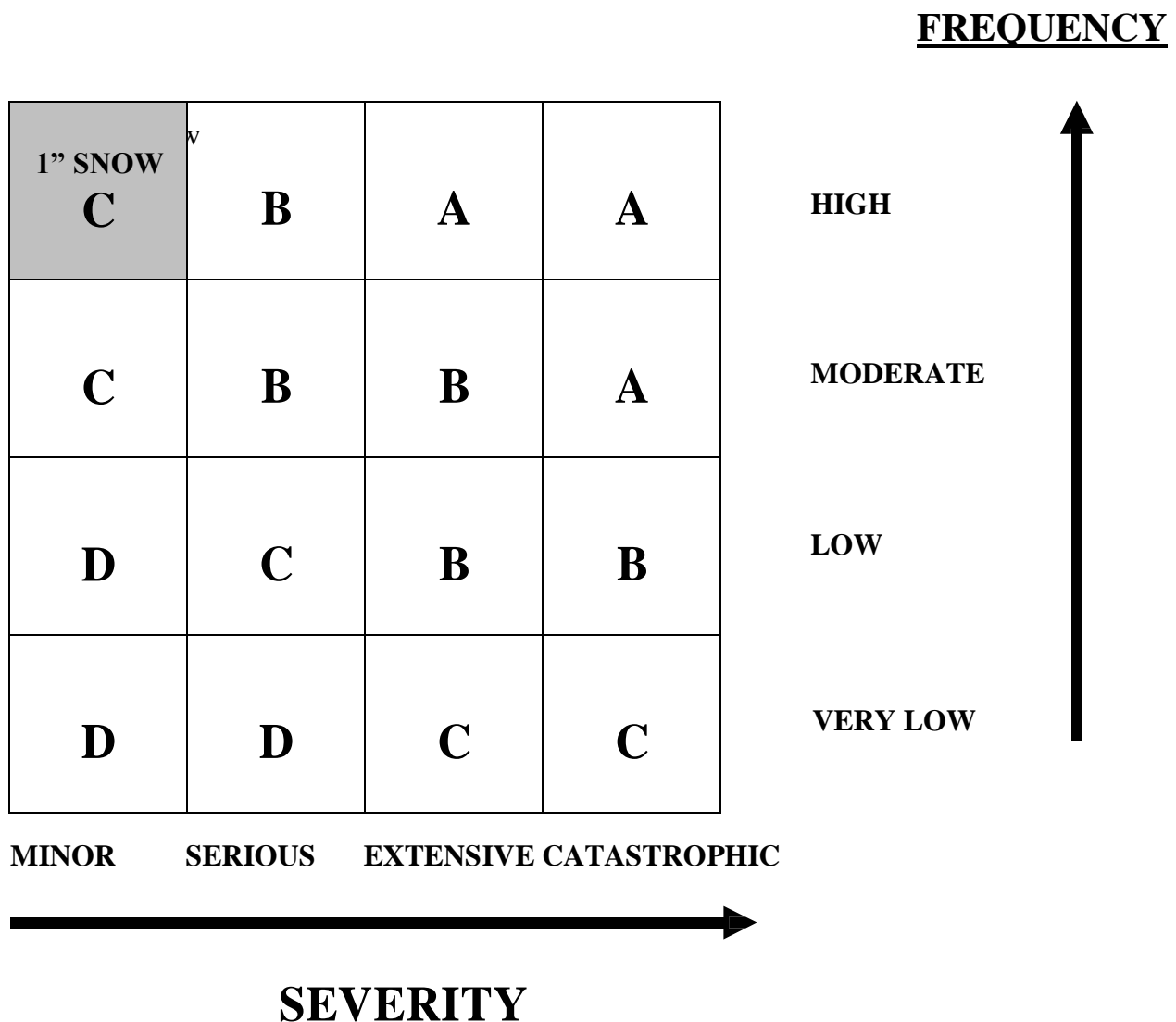
Returning to our examples of winter storms, if we apply the risk matrix to these two events we can get an idea of how this method is used to evaluate various hazard conditions.

EXAMPLE #1: 1" SNOWFALL

As we said earlier, one inch of snow is a very common occurrence during a Pennsylvania winter, that is HIGH FREQUENCY. Its severity in most cases would be considered MINOR.

RISK MATRIX

Example #1: One Inch Snowfall



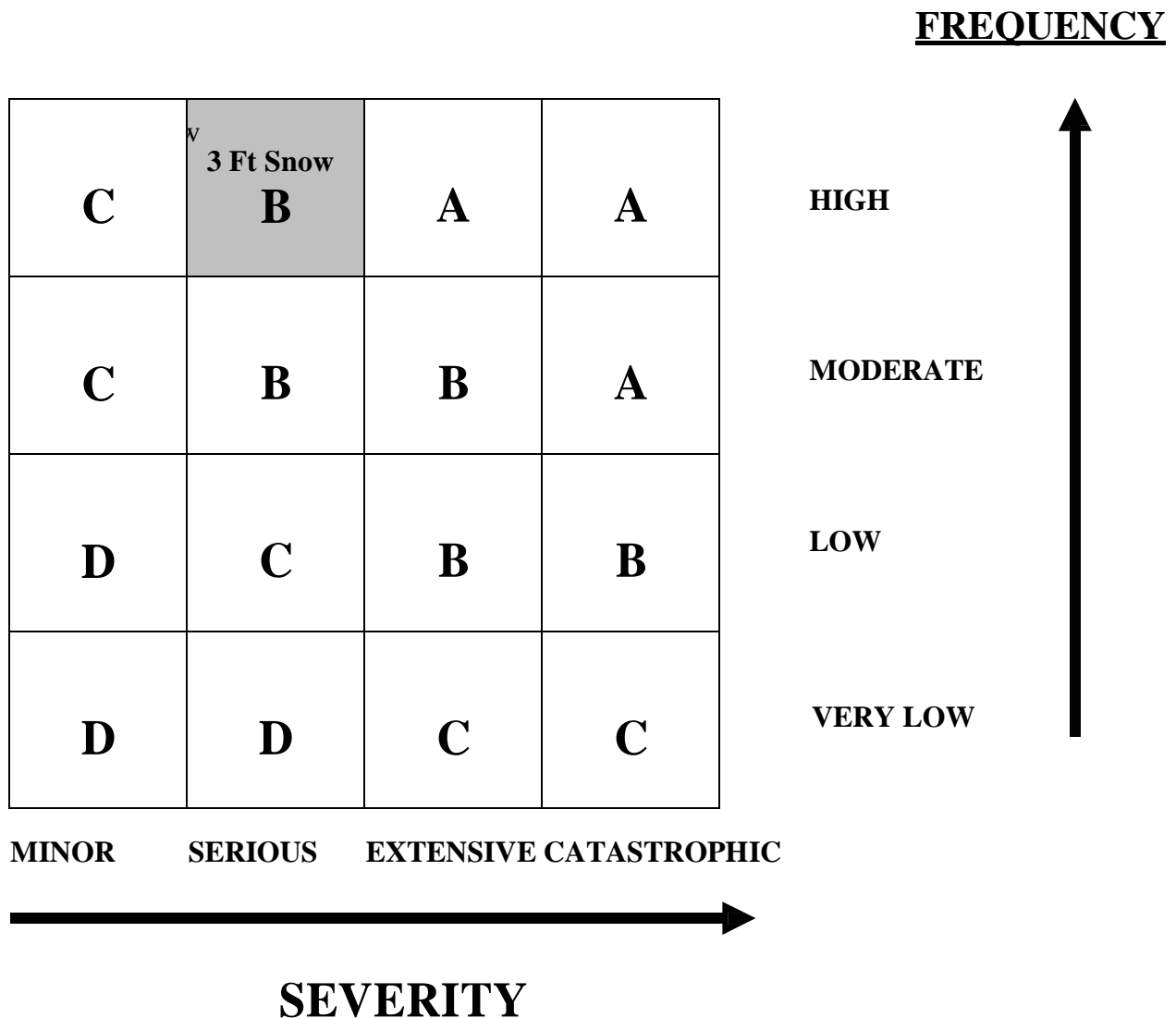
A one-inch snowfall is a high frequency, minor severity hazard that should be considered, as a Class C risk, for possible further mitigation and planning.

EXAMPLE #2: 3 FOOT SNOWFALL

Three feet of snow, though not as frequent, is also a common occurrence during a Pennsylvania winter, that still rates as HIGH FREQUENCY. It's severity, however, would probably be considered SERIOUS.

RISK MATRIX

Example #2: Three Foot Snowfall



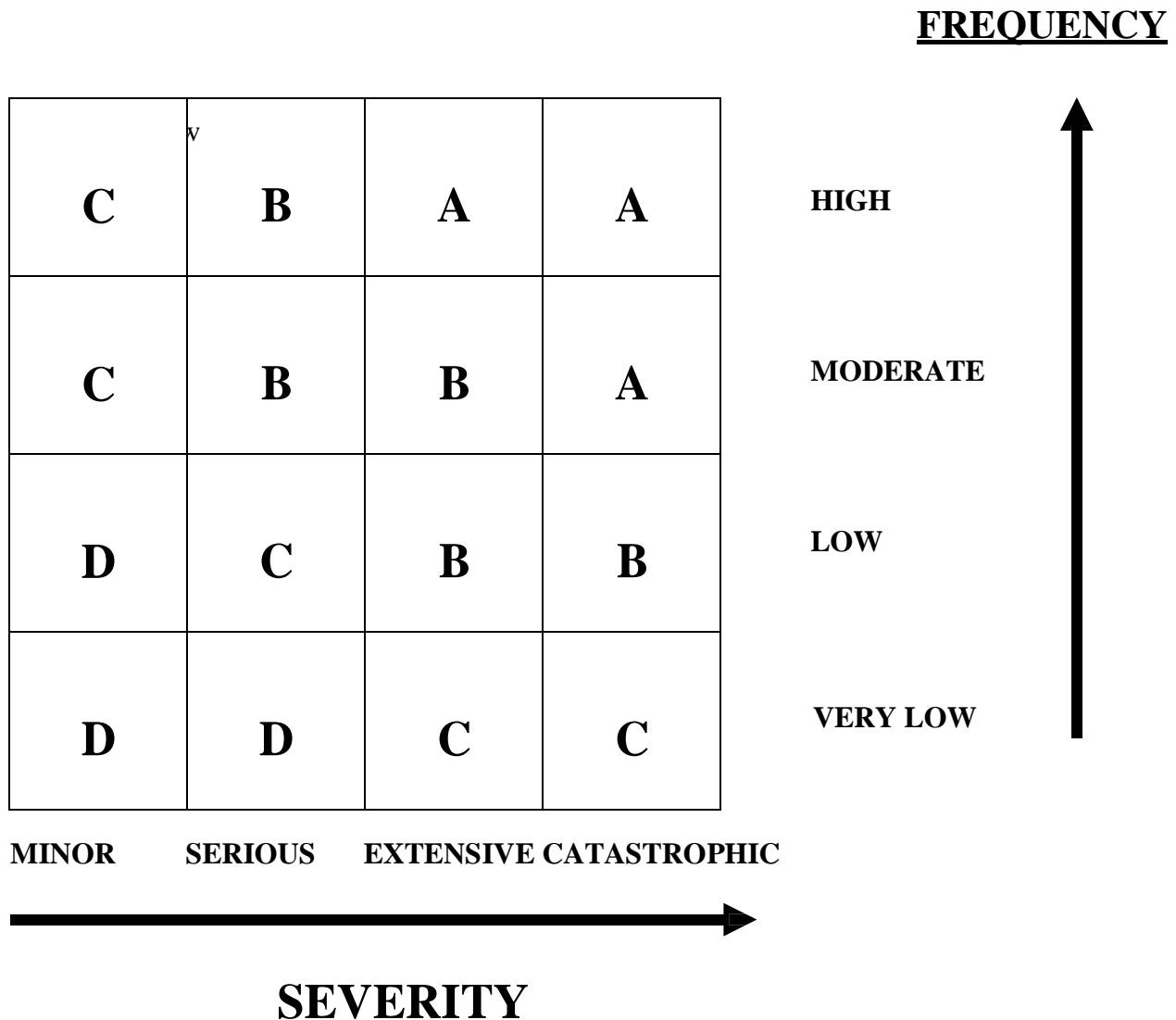
In our second example the risk category is increased to Class B, a moderate to high risk condition to be addressed by mitigation and contingency planning for prompt action.

Get the idea? Now, let's try the risk matrix approach with the list of hazards you identified for your community in Exercise #1.

EXERCISE #3: RISK MATRIX HAZARD ANALYSIS

Using the list of hazards you identified for your community in Exercise #1, determine which risk category on the risk matrix below each hazard falls into. Remember to include all of the different levels of frequency and severity that apply to the hazards your community contends with (For example: minor spring flooding, moderate flash flooding, and a hundred year flood). When you have analysis all your hazards, classify each into a hazard risk category (A through D) on the form provided on the next page.

RISK MATRIX HAZARD ANALYSIS



EXERCISE #3 (Con't)

RISK MATRIX HAZARD CATEGORY LIST

Category A (High risk/high priority)

1. _____
2. _____
3. _____
4. _____

Category B (Moderate to high risk/prompt action priority)

1. _____
2. _____
3. _____
4. _____

Category C (Significant risk/further consideration priority)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Category D (Low risk/advisory priority)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

Hazard Mitigation Planning

PART FOUR: CAPABILITY ASSESSMENT

If everything is going right, by now you should have a pretty good idea of the hazards that threaten your community and which ones would cause the most harm. By looking at the risk category list you just completed, you should also be getting an idea of which hazards require the most immediate attention. The risk category list you just completed is the beginning of a hazard mitigation planning task called **prioritizing risk reduction**. We will return to this step in developing a hazard mitigation plan a little later in this course. But before we can properly prioritize our mitigation efforts, we need to consider our resources and capabilities to reduce the risk from our identified hazards. We call this next step **CAPABILITY ASSESSMENT**.

Capability Assessment, put simply, means looking at what you are doing, what you are not doing, what you can do, and even what you are doing wrong to reduce your community's risks from hazards.

CAPABILITY ASSESSMENT ...what you are doing, what you are not doing, what you can do, and even what you are doing wrong...

To some people in hazard mitigation, Capability Assessment is like the ugly duckling or the forgotten child of the planning process. Instead of looking at powerful winter storms, devastating earthquakes, giant hurricanes or tornadoes, capability assessment looks at government programs and policies, regulations and ordinances, existing emergency plans, personnel and equipment, and the like. Interesting and exciting stuff! Are you still awake?

For all of its lack of glamour and excitement, flashing lights and sirens, capability assessment is arguably the first place, as the old advertisement said, "where the rubber hits the road" in hazard mitigation planning. Up until now our planning tasks have focused on what might happen and what the consequences might be, "What if" kinds of things. Capability assessment is the first activity where you begin to look at what is actually in place (or not in place) in your community to reduce the risks that you face. It is where you first look at the nuts and bolts of your mitigation strategy.

Capability assessment incorporates a wide range of view to be truly worthwhile. In the case of man-made hazards stemming from chemical production, storage and transportation and nuclear facilities, capability assessment means locating and reviewing a number of legally mandated, public documents from private facilities and government agencies. Your local emergency management coordinator will be able to assist you in locating them. These documents can assist you in locating the hazardous materials production and storage facilities in your community. They will also tell you the kinds and quantities of these materials on site. Also available are reports that tell you how many hazardous materials have occurred in your community, where they occurred, what chemicals were involved and how the problem was

handled. Many of these facilities (including nuclear power stations) are also required to develop "worst case scenario" reports that forecast the consequences that would occur in your community if a major disaster occurred at their site. This information can be helpful to you determining the consequences of such an event in your hazard vulnerability analysis.

Capability assessment also means making a thorough review of your community's local laws and regulations. A disaster resistant community should have in place a number of safeguards that control where and how development can occur. The following list includes many of the policy and regulatory documents to consider and evaluate, for both positive and negative impacts on your community's safety:

- Adequate building codes
- Land use, zoning and subdivision regulations
- Floodplain and storm water ordinances
- Comprehensive plans
- Capital improvement and transportation plans
- Facilities and needs studies
- Population growth and future development studies
- Economic development plans
- Emergency management response and recovery plans
- National Flood Insurance Program (NFIP) participation
- NFIP Community Rating System programs

Each of these local policies, regulations and programs can contribute to reducing risks from disaster.

The capability assessment should also look beyond the local community to the next highest level of governmental responsibility. Cities, towns, and other municipalities should look at what protections are in effect at the county level. Counties should consider the mitigation efforts and protections afforded by state government and regulatory agencies.

Your capability assessment should recognize the positive mitigation steps that have been taken and realistically point out any deficiencies where improvements can be made to increase disaster resistance in your community. Ultimately, your hazard mitigation plan will be included in this list of positive risk reduction safeguards. Beyond that, a careful and considered hazard mitigation plan can be the centerpiece that connects and coordinates your local policies and regulations in a comprehensive multi-hazard defense strategy.

Capability assessments also look at the resources available to local communities to reduce disaster risks. Resources can be divided into five categories: human, physical, technical, informational and financial.

HUMAN RESOURCES

Human resources include local police, fire, ambulance, and emergency management & response personnel. Local government operation and services, electric, gas, and other utility providers, all need to be able to function during critical periods in disasters. Doctors, nurses and other medical assistance personnel should also be considered in assessing your community's mitigation capabilities. Teachers, social service workers, mental health professionals, clergy and volunteer service workers can play vital roles in public awareness and safety education in preparation for disasters and assist in post-disaster response and recovery. Businesses and local citizens can also be key assets in preparing for disasters. These people in your local community can become part of your hazard mitigation planning early on with the formation of a local hazard mitigation committee. The experience and expertise, shared memory and emotional ties to the community of such a local hazard mitigation planning committee can greatly enhance the depth and thoroughness of your plan. The involvement of people early on can also raise community awareness and commitment to your plan, its objectives and its overall purpose. That may be the most important goal of all.

PHYSICAL RESOURCES

Physical resources include the equipment, vehicles, public lands, facilities and buildings available to the community. The review of your physical assets and needs should include emergency response and recovery equipment and vehicles. While response and recovery is often thought to be a different aspect of emergency management from hazard mitigation, your community's ability to carry out these vital tasks during and immediately after a disaster are important components in reducing the extent of loss and damage—thus hazard mitigation. Once identified, the status and condition of equipment and vehicles and your current and future needs can become the basis for a capital improvement, investment and budget planning.

Facilities and buildings play a critical role in hazard mitigation. Locations which house essential community functions like police, fire and rescue, sewage treatment and water supply, government services, etc., should be evaluated for their structural safety and ability to sustain operations under a disaster situation. Public buildings, like schools and churches, should be evaluated for their disaster resistance and availability as emergency shelters. Hospitals, daycare and senior centers should be assessed to determine excess capacity for special needs persons and emergency care. Even private homes and developments can have emergency "safe rooms" built into them to provide accessible security from certain types of hazards. Locations for businesses to relocate to after a disaster, like excess capacity at a local industrial park or unused warehouse, can often be identified to maintain and re-establish important employers and the local economy.

Open public land can often be a useful resource in hazard mitigation. If it is suitable for development, these locations can be used for relocation or replacement construction of homes at risk from flooding or other hazards. Open space land along floodways should be evaluated to ensure it is maintained properly. Trees on public and private land near homes and businesses should be inventoried and regularly inspected to reduce wind-related dangers; many communities have shade tree commissions for this purpose.

TECHNICAL/TECHNOLOGICAL RESOURCES

In addition to the human and physical resources available to improve their ability to reduce the consequences of disaster, communities also need to consider their technical and technological resources. Early warning systems, weather alert radios, stream-level monitoring gages, 911 communication systems, all are technological systems with which most communities are familiar. As familiar as some of these systems are, with the rate of technological advancement today, each of these technologies is becoming more sophisticated and more useful in effective mitigation. Weather alert radios can now be turned on from a remote warning site for specific locations and sound an emergency tone and instructions. "Real-time" stream gages that send measurements via satellite for better advance flash flood warning are currently (no pun intended) being incorporated into the existing monitoring system. "Reverse" 911 systems allow emergency centers to reach specific at-risk locations in event of pending threat.

In today's world, it's impossible to talk about technological resources without mentioning computers and the Internet. With more "computer literate" people in our society and the affordability of the technology, computer systems are within the means of almost every community in Pennsylvania today. Of most interest today to emergency management and mitigation planners are computer based mapping programs, known as Geographical Information Systems or GIS. These software programs produce sophisticated map images of communities which, when coupled with other information databases, can provide a wealth of visual and factual information for disaster planning, response and recovery. While the initial cost for GIS and the skill and training requirements for such systems may be beyond some communities means, it is important to at least develop access to this tool through other local and county governments that have it.

The Internet is home to hundreds of web pages and home sites related to all types of disasters, emergency management and hazard mitigation, as well as State and Federal agencies like PEMA (www.pema.state.pa.us) and FEMA (www.fema.gov). At the end of this manual is a list of Internet addresses about hazard mitigation topics you can check out.

INFORMATIONAL RESOURCES

Besides the wealth of information about disasters, hazard mitigation, and planning that is available on the Internet, there are other very good sources of helpful information in print and on video from a number of sources. Some of these sources you have already received as a part of the training packet for this course. As with the Internet addresses, a list of these reference publications and video presentations are provided at the end of this manual.

Assessment of informational resources should also consider a community's ongoing public awareness and education efforts and needs. A community that is informed and knowledgeable about disasters, risk reduction, and how to react is better prepared when disaster strikes.

FINANCIAL RESOURCES

The final portion of our hazard mitigation capability assessment is often the one of most concern to local communities: Where will we get the money for hazard mitigation in our community? To begin with let's look at the federal and state sources for funding, listing them first and then going on to discuss them in more detail.

- HAZARD MITIGATION GRANT PROGRAM (FEMA/PEMA)
- FLOOD MITIGATION ASSISTANCE PROGRAM (FEMA/PEMA)
- FLOOD MITIGATION ASSISTANCE PLANNING GRANT (PEMA)
- PROJECT IMPACT (FEMA)
- COMMUNITY DEVELOPMENT BLOCK GRANT
- SMALL BUSINESS ADMINISTRATION LOAN PROGRAM

Other State agencies that have funding programs related to mitigation include:

- Department of Community and Economic Development
- Department of Transportation
- Department of Environmental Protection
- Department of Conservation and Natural Resources
- Department of Agriculture

Most State and Federal grant programs require local communities to provide at least part of the necessary project funding in real dollars or through "in-kind" services. While the percentage of local contribution varies from program to program, local communities need to assess their financial capability and resources to implement their hazard mitigation action plans.

PRIORITIZING HAZARDS

Upon completing your capability assessment, you should have a pretty good idea of your community's assets and potential needs to now develop and implement a comprehensive, multi-hazard mitigation action plan. For an effective plan to take shape, it is necessary to review the types of hazards and risk levels identified in your hazard vulnerability analysis and rank them in order of priority. The hazards identified as most destructive and of greatest danger (Category A) will be the first priority, Category B the second priority level, and so on until all of your identified hazards have been classified. Once this priority review has been completed, the work of matching capabilities to specific types of hazards, deciding on mitigation measures, and developing a local hazard mitigation action plan can FINALLY proceed.

DID SOMEBODY SAY---ABOUT 20 PAGES AGO---THAT THIS WAS SIMPLE???????

Hazard Mitigation Planning

PART FIVE: TYPES OF MITIGATION MEASURES

By now in your hazard mitigation planning activities, you should have a good idea of where your community's greatest risks lie and what resources are at your disposal. The next step is to determine what mitigation alternatives exist to effectively reduce your risks and the destructive consequences of your identified hazards.

If we try to address each specific hazard for each community and develop mitigation measures for each type and severity level of hazard, this course would continue for a very long time. It is probably safe to say that nobody wants that. That level of specificity really needs to occur at the local level with the people who best know the territory and risks, and will most directly suffer the consequences of a disaster. Where this course can be helpful in getting that process started is in providing some general ideas about different types of mitigation measures.

There are six general approaches to reducing hazard risks: Preventive measures, property protection, emergency services measures, structural projects, natural resource protection, and public information.

PREVENTIVE MEASURES keep problems from getting started or getting worse. The use of known hazard areas, like floodplains for example, can be limited through planning, land acquisition, or regulation. These activities are usually administered by building, zoning, planning, and/or code enforcement officials:

- Planning and zoning
- Open space preservation
- Building codes and enforcement
- Storm water management
- Drainage system maintenance

PROPERTY PROTECTION measures are those actions, which go directly to permanently getting people, property, and businesses out of unsafe areas where, in terms of wise disaster planning, they shouldn't have been in the first place.

The first of these measures is property acquisition: public procurement and management of lands that are vulnerable to damage from hazards. In Pennsylvania, for example, over 700 flood-damaged homes have been purchased by local municipalities (using state, federal, and local funds) and removed from flood-prone areas (by demolition or relocation). The acquired land then becomes public property, which can only be used as "open space" in the future. Open space use means that future development of the site is restricted to low-impact uses

like parks, playing fields, gravel parking lots or agriculture--no permanent or enclosed structures.

Relocation of at-risk structures also achieves the same result as acquisition. The home or business is moved to a safer location but it remains the property of the individual owner, the original site is purchased and maintained by the local municipality.

Elevation of structures can be an effective in-place mitigation for some flood-threatened homes. By raising the height of the structure's living area above flood levels, damage and threat to life can be reduced. Retrofitting of homes is another in-place damage reduction method. Utilities, services, systems and appliances in some homes can be raised above flood levels. Construction techniques to improve structural resistance to high wind or heavy snow accumulation can be incorporated into new homes or retrofitted into existing structures.

Private home and business insurance policies and participation in the National Flood Insurance Program can also reduce uninsured losses to properties.

EMERGENCY SERVICES MEASURES are taken during a disaster to minimize its impact. These measures are the responsibility of city or county emergency management staff, operators of major and critical facilities, and other local emergency service organizations. They include:

- Alert warning systems
- Monitoring systems
- Emergency response planning
- Evacuation
- Critical facilities protection
- Preservation of health and safety

STRUCTURAL PROJECTS are usually designed by engineers and managed and maintained by public works staffs. They are designed to reduce or redirect the impact of natural disasters (especially floods) away from at-risk population areas. Examples include:

- Reservoirs
- Levees, floodwalls
- Diversions
- Channel modifications
- Storm sewers

NATURAL RESOURCE PROTECTION preserves or restores natural areas or their natural functions. Such measures are usually implemented by park & recreation organizations, conservation agencies or wildlife groups. They include:

- Wetland protection
- Best management practices

- Erosion and sediment control
- Riverine protection

PUBLIC INFORMATION PROGRAMS advise property owners, potential property owners, and others of hazards and ways to protect people and property from them. A public information office usually implements them. Public information activities can include:

- Flood maps and data
- Library resources
- Outreach projects
- Technical assistance
- Real estate disclosure information
- Environmental education programs

Your mitigation planning committee should look at the range of measures for each identified risk in your community. Working together, “brainstorm” all of the possible mitigation measures that might help reduce risks for the range of hazards your community is susceptible to. These are your “mitigation alternatives.” The next step is to review all of these alternatives and select the most appropriate ones for your community. Finally, you are ready to document your hazard mitigation recommendations in a written plan.

Before we close, a few words about adoption, implementation, monitoring, evaluation and review of your local hazard mitigation plan.

ADOPTION OF THE PLAN

Getting public acceptance of a hazard mitigation plan is vital to reducing conflicts and building support for your recommendations. A draft plan should be advertised and made available for review by affected residents, businesses, community departments, interested organizations, state and federal agencies, and neighboring communities. If your mitigation planning committee represents other interests or organizations in your community, their organizations could pass resolutions to officially support the plan.

After the public has had several weeks to review your plan, hold a public meeting or workshop to allow comment, discussion and suggestions about the plan and revise your plan accordingly. Final adoption by the local governing body can then occur. Once approved the plan should be made available to the public, sent to local, state and federal government agencies. PEMA is the State agency of record for mitigation plans.

IMPLEMENTATION, MONITORING, EVALUATION AND REVISION

The key to successful implementation is ensuring that the people responsible for the recommendations understand what is expected of them and are willing to work toward their implementation. That’s why it’s important to involve those people in the planning process right

from the start. Your plan should identify some visible but inexpensive projects that can be quickly implemented to help reassure the public and those involved that something is being accomplished. A locally organized and inexpensive project, such as a stream clean-up or public information campaign, can be achieved quickly with local resources to help get the ball rolling and generate attention.

Monitoring the plan ensures that your plan is being implemented and staying on track. You should realize that no plan is perfect and changes will be needed along the way. You should have a formal method to measure progress, assess your implementation, and decide on needed changes. The person or agency responsible for monitoring your plan and how that task is accomplished should be expressed clearly in your plan. Your mitigation planning committee can continue to function to periodically review progress and make further recommendations to those responsible for implementation.

CONCLUSION

We are finally at the end of our little "How To" guide to hazard mitigation planning and you may be thinking, "You call that simple and easy?" You may be right. As much as we have tried to stick to the basics and avoid unnecessary information, looking at an entire community, all of the risks it faces, and coming up with ways to reduce those risks, may not be all that simple and all that easy. The point here is that it can be done by virtual any community in Pennsylvania, large or small, if they have the right people involved, take their mission seriously, and take the time to think things through and carefully consider what the best course of action is. Even if you decide to have a mitigation plan developed by an outside consultant, at least this guide can help you recognize what a good plan should be.

Finally, a community can be defined as a group of people who have a common self-interest or who together face a common adversary. This meaning of community is rarely ever better illustrated than in the case of disaster. In working together to develop a plan that prepares you for future disasters you demonstrate community in the fullest sense.

Reference materials for this guide include:

Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments (FEMA)
Mitigation For Emergency Managers Course (FEMA, Emergency Management Institute)
An Evaluation Checklist For Review of State Hazard Mitigation Plans (FEMA Mitigation Directorate)
Local Hazard Mitigation Planning Manual (North Carolina Division of Emergency Management)
Flood Mitigation Planning, The CRS Approach, Wetmore and Jamieson (Natural Hazards Informer)
Hazard Mitigation Planning Course: Regional Level (Emergency Management Institute NETR)
Planning for Post-Disaster Recovery and Reconstruction (FEMA, American Planning Association)
Multi-Hazard Identification and Risk Assessment Report (FEMA)

"Hazard Mitigation Made Easy" was developed for the Pennsylvania Emergency Management Agency by Don Smith, Hazard Mitigation Specialist.