

OHIO NATURAL HAZARD MITIGATION PLANNING GUIDEBOOK

A step-by-step guide to help communities prepare natural hazard mitigation plans and minimize future losses



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INTERIM GUIDANCE

PREFACE

The purpose of this document is to provide counties, cities, villages, watershed groups, and other local entities with a model process to plan for natural hazards and mitigate the effects of those hazards. The strong home-rule form of government in Ohio means that local governments in the state are the primary decision-makers for land use management, building codes, zoning, and other regulatory tools. Therefore, development of a natural hazards mitigation plan at the community level is vital if the community is to effectively address natural hazards.

The primary purpose of any locally developed plan is to meet specific community needs. Use of this guidebook will help counties, cities, and villages think through their own hazard mitigation needs and opportunities and allow them to identify activities that can be implemented regardless of whether a disaster has occurred.

This model was developed with statutory requirements for various mitigation programs in mind. For example, plans developed using this model will be compliant with the Disaster Mitigation Act of 2000, qualify for credits in the Community Rating System, assist communities preparing Hazard Mitigation Grant Program project proposals, and comply with many requirements of the Flood Mitigation Assistance Program.

Current Ohio law contains little regarding statutory land-use planning requirements. As a result, there is great flexibility in the planning model that can be used. It is important to note; however, that land use policies, regulations and programs that are a result of an adopted plan have much more credibility to both the public and legal system.

This document was prepared out of the need for planning guidance that has relevance to Ohio communities. We were fortunate to have many wonderful planning guides at our disposal when preparing this guidebook. Specifically the authors of *Flood Hazard Mitigation Planning: A Community Guide* from Massachusetts, the *National Flood Insurance Program Community Rating System Example Plans* document from FEMA, *Understanding Your Risks: Identifying Hazards and Estimating Losses* document from FEMA, *National Flood Programs in Review – 2000* from the Association of Floodplain Managers, and FEMA Region V mitigation planning training materials are recognized.

Please note that there are several websites and links to webpages listed. Although we have attempted to make sure the links are current, websites are frequently updated and the links may become outdated.

Finally, we would like to acknowledge the leadership of the Ohio Department of Natural Resources and the Ohio Emergency Management Agency for making this collaborative effort possible.

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LIST OF COMMONLY USED ACRONYMS

CRS	Community Rating System
DMA2K	Disaster Mitigation Act of 2000
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance Program
HMGP	Hazard Mitigation Grant Program
NFIP	National Flood Insurance Program
ODNR	Ohio Department of Natural Resources
Ohio EMA	Ohio Emergency Management Agency

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- [Appendix D:](#) Tools for Reaching Consensus
- [Appendix E:](#) FEMA Guidance for Preparing Local Mitigation Plans
- [Appendix F:](#) Example Plan (To Be Developed)

INTRODUCTION

DAMAGES CONTINUE TO RISE

Consider the following selection of federally declared disasters and the resources made available to address the damages that occurred:

DATE DECLARED	INCIDENT TYPE	COUNTIES DECLARED	FUNDS PROVIDED
March 4, 1997	Flash flooding on inland rivers/streams and Ohio River flooding	Adams, Athens, Brown, Clermont, Gallia, Hamilton, Highland, Hocking, Jackson, Lawrence, Meigs, Monroe, Pike, Ross, Scioto, Vinton, Washington and Morgan	\$ 38,334,310 (P)
			\$ 9,476,264 (I)
			\$ 9,821,524 (M)
			\$ 9,821,524 (SM)
June 30, 1998	Flash flooding, flooding, high winds and tornadoes.	Athens, Belmont, Coshocton, Guernsey, Harrison, Jackson, Jefferson, Knox, Meigs, Monroe, Morgan, Morrow, Muskingum, Noble, Ottawa, Perry, Pickaway, Richland, Tuscarawas, Washington; Franklin, Sandusky Holmes	\$ 30,251,278 (P)
			\$ 4,700,000 (I)
			\$ 5,866,126 (M)
			\$ 5,866,126 (SM)
March 7, 2000	Flash flooding, flooding	Adams, Gallia, Jackson, Lawrence, Meigs, Pike, and Scioto	\$ 504,532 (I)
			\$ 297,310 (M)
			\$ 297,310 (SM)
August 25, 2000	Flooding	Lucas	\$ 2,446,497 (I)
			\$ 873,931 (M)
			\$ 873,931 (SM)
September 26, 2000	High winds and tornadoes	Greene	\$ 75,859 (I)
			\$ 2,216,008 (P)
			\$ 558,025 (M)
			\$ 558,025 (SM)

- (I) – Individual and Family Grant
- (M) – Hazard Mitigation Grant
- (P) – Public Assistance
- (SM) – State Mitigation funds

Annual losses from natural hazards continue to rise in Ohio and nationally. Average annual losses from flooding in the United States averaged \$2.2 billion (in current dollars) in the 1910’s and increased to \$5.6 billion in the 1990’s¹. Flooding is Ohio’s primary natural hazard.

SUSTAINABILITY, DISASTER RESILIENCE, AND MITIGATION

“We should exercise foresight now, as the ordinarily prudent man exercises foresight in conserving and wisely using the property which contains the assurance of well-being for himself and his children. . . We want to see him exercise forethought for the next generation. We need to exercise it in some fashion ourselves as a nation for the next generation.”

-- President Theodore Roosevelt, 1908

Although these words were spoken nearly one hundred years ago, concerns about planning and conservation, or wise use, of our resources are still very valid concerns.

Today, this idea has evolved into a concept called *sustainability*². Sustainable development, broadly defined, means development that meets the needs of the present

¹ NAI: *A Common Sense Strategy to Protect Your Property*, 2001

² The description of sustainability, disaster resistance, and comprehensive planning presented here was excerpted from *The Association of State Floodplain Managers National Flood Programs in Review*, 2000.

generation without compromising the ability of future generations to meet their own needs. The major principles of sustainability include the recognition of the interconnectedness of environmental, economic, and social actions; a balance of present needs with future needs; recognition of natural and geographic boundaries rather than artificial or political boundaries within which to make decisions; and a locally based, participatory planning and decision making process. More and more *disaster resiliency* is being included as another component of community sustainability. As used in relation to natural disasters, resiliency or resistance means being able to “bounce back” fairly quickly from an extreme natural event (such as an earthquake, tornado, hurricane, or flood) without permanent, intolerable damage or disruption of natural, economic, social, or structural systems and without massive amounts of outside assistance.

Ideally, if it has given proper attention to the principles of sustainable development and disaster resilience, a community should be able to withstand most natural extremes such as floods without experiencing them as “catastrophic” or “disastrous” events. A community that has undertaken a comprehensive set of natural hazard mitigation activities along with its measures for sustainability gains multiple benefits. Not only is the community safer and more resistant to disaster, it is also more economically and environmentally durable and more efficient. Lives are saved, injuries are minimized. Essential services can reach people in need. Devastating property damage and community disruption are minimized. Business can resume more quickly or continue as usual in the face of hazardous events. Homes and schools can avoid costly repairs. Local governments can meet their mandate to ensure the health, safety, and welfare of their citizens, even in the face of natural disasters. In addition, the residents of such a community enjoy a stronger economy and a better quality of life on a day-to-day basis.

Sustainability emphasizes planning as a primary approach to involve local citizens, obtain broad input, and develop real goals and action plans. It is holistic, broad-based, sensitive to the natural environment and demands local control and responsibility. So how do natural hazard mitigation planning and sustainability fit? Every community in Ohio faces natural hazards, whether it is flooding, tornadoes, subsidence or some other disaster. In turn, every community is responsible for making decisions on how to *mitigate* against damage caused from these hazards.

FEMA defines hazard mitigation as “any action taken to reduce or eliminate the long-term risk to human life and property from hazards.” Mitigation activities have been implemented for many years in Ohio. In many areas of Ohio, the NFIP makes flood insurance available and Ohio Mine Subsidence Insurance Fund makes mine subsidence insurance available. The Ohio’s Dam Safety Program inspects high hazard dams to ensure that they will function properly during times of flooding while the Hazard Mitigation Grant Program provides funds for community projects that purchase, elevate, relocate, or retrofit structures in floodplain areas. Structural measures such as dams, dikes, and levees are important to mitigate the impacts of flooding, as are several non-structural alternatives. The Chagrin River Watershed Partners, for instance, has developed a whole host of tools to ensure that development in the watershed results in

little or no impact to adjacent properties and preserves the natural and ecological functions of the floodplain.

Whatever the hazard, there are actions that can be taken to address those hazards – no matter how small -- that can support disaster resilience and sustainability.

A natural hazards mitigation plan is a collection of analyses, policies, and actions on how the community will grow and change in the future, and should also be a blueprint for how it can achieve and maintain sustainability and disaster resiliency. The plan is the result of a process that involves many local departments, business people, landowners, developers, and citizens. Out of the process emerge policies that reflect local values and concerns.

Land-use planning (like comprehensive planning and/or natural hazards mitigation planning), zoning, and subdivision control are a community's primary land use tools. They serve as a foundation for the community to address development concerns in high risk areas, such as floodplains. For example, if the community policy is to avoid development in the floodplain, the plan should indicate that major investments in new roads and utilities will not be made into those areas. If, through the planning process, the community has decided to convert portions of the floodplain to recreational use or open space, that too, should be stipulated in the natural hazards mitigation plan and/or comprehensive plan.

The Stafford Act as amended (which authorized DMA2K) requires that a natural hazards mitigation plan, meeting program criteria, be developed in order that communities will be eligible for future pre-disaster and post-disaster mitigation program funds (i.e. HMGP, FMA, etc.). The purpose of the plan is to ensure that the community has established goals and objectives, in addition to a well thought out process for mitigating future damages before approving projects. A political jurisdiction may develop their own plan or be part of a multi-jurisdictional plan, which includes several communities with similar hazards. **It is important to note that in the future, a community or jurisdiction without a natural hazard mitigation plan will not be eligible for most sources of mitigation funding.**

OHIO’S MODEL NATURAL HAZARD MITIGATION PLANNING PROCESS – AN OVERVIEW

Many planning models have been created to plan for natural hazards and mitigation. Regardless of the actual process used by the community, the plan should be created by a diverse committee representing all facets of a community, have ample public input, analyze a broad range of problems and actions, and be officially recognized by the community. Finally, don’t have the mindset that once the plan has been developed, it cannot be adjusted from time to time! Almost any plan that is actually being carried out will have to be adjusted to reflect the realities of plan implementation and development.

The purpose and goal of this guidebook is to provide a step-by-step process to assist local officials, planners, emergency managers, zoning administrators and consultants in developing and implementing successful local natural hazard mitigation plans. In the next several sections, detailed descriptions of the eleven planning steps below are provided. While using this process is not mandatory, we encourage your community to use these chapters as a template to help in developing your plan.

Section One	Organize resources and prepare to plan
Section Two	Identify hazard(s) /conduct hazard analysis
Section Three	Identify the problem(s)
Section Four	Set goals
Section Five	Identify possible activities
Section Six	Select best activities and develop action plans
Section Seven	Prepare your draft plan
Section Eight	Seek public input, state, and federal review
Section Nine	Prepare the final plan
Section Ten	Adopt the plan
Section Eleven	Implementation, monitoring and adjusting the plan

SECTION ONE: ORGANIZE RESOURCES AND PREPARE TO PLAN

Although it sounds strange, the first section is really all about planning to plan! Some thought and organization before the planning process actually begins will go a long way toward ensuring successful planning.

This section has six steps:

1. Get community's governmental leadership to support the planning effort
2. Form a core (planning) group
3. Identify expertise to help with the planning process and provide input into the plan
4. Involve other agencies
5. Choose a planning model to follow
6. Decide how the public will be informed

Step 1: Get Community's Governmental Leadership Support

Obtaining the support of the community's governmental leaders (both elected officials and appointed agency directors) is the best foundation for a planning effort. Whether a board of county commissioners passes a resolution of support, or a letter of support is obtained from a community's planning commission, a particular jurisdiction's leadership and support of the planning effort is critical. This support will give the core group the confidence and motivation that their efforts will make a difference. Since it will be up to the community's leaders to provide resources to implement the plan, they must support what is recommended by the plan.

Step 2: Form a Core Group

Secondly, a core group must be formed. Whether this group is a committee, task force, or some other entity, the core group will lead the planning process. Who should be members of this core group? The core group should be no more than ten to fifteen members and should represent a cross-section of people in the community including local government staff, the public, local businesses, local interest groups, etc. This core group will be a forum to review the needs and concerns of all interested groups, and a means for participants to keep their community up to date on the plan's progress. Also, the group will be responsible for doing some or most of the work in preparing the plan.

TIP:

Members of the core group may include:

- ▶ Local elected officials
- ▶ Local agency staff (planning, emergency management, planning commission, zoning commission)
- ▶ Residents
- ▶ Representatives of homeowner or neighborhood associations
- ▶ Business owners
- ▶ Representative of local Chamber of Commerce
- ▶ Farmers
- ▶ People involved in community development (land developers, real estate agents, lenders)
- ▶ Civic and non-profit organization representatives

It may be necessary at this point to educate the core group about mitigation concepts, disaster mitigation planning, and its importance to the local community.

Step 3: Identify People to Assist in Plan Preparation and Development

The third step of organizing resources to plan is identifying expertise to help with the planning process. This will vary from community to community. Generally a person is needed to facilitate group meetings. A facilitator is a neutral person who focuses on guiding the committee using tools and techniques to allow the committee to reach consensus on problems and solutions. Also, a person is needed to actually write the plan and take notes during planning meetings. Having an assigned scribe that takes detailed notes will make writing the plan much easier. A person or group is also needed to produce maps, diagrams, and other technical documents. The person writing the plan can be the same as the facilitator, or could be a member of the core group that has good grammar and can write with clarity. The person or group that is responsible for producing maps and other technical information should have a little more technical knowledge about the

TIP:

What if a community doesn't have the financial resources to hire a consultant to do all of the things described above? With a little extra work, many of these activities can be completed by the community at little or no cost. For example, a community may receive a small grant to produce a mitigation plan. The core group may find that it can get the county planning department, a local watershed coordinator, extension agent, or volunteers to assist with meeting facilitation, producing the needed maps and technical documents for the plan, and writing the plan itself.

The Ohio Department of Natural Resources and Emergency Management Agency can offer technical assistance on an as-needed basis.

subject and could include a person or person(s) from a community planning department, engineering department, local university, or some other governmental agency.

In this third step, the cost of producing the plan should be considered. Often a community will use a grant or other funding to hire a consultant who is responsible for facilitating the meetings, producing maps and other technical data, performing research, and writing the plan. A good consultant will work hard to ensure that the core group is participating in the plan development and has ample input into the plan.

Step 4: Involve Other Agencies

This step requires notification of other local, state, and federal agencies, as applicable, of the community's intent to begin planning and soliciting their involvement. A telephone contact, letter, or e-mail should be sent to agencies that: could be of assistance to the community, have regulatory jurisdiction in the community, or have an interest in the planning process. In addition to notifying the agency of the community's intent to plan, the letter should request any plans (construction, long-range use, etc.) pertaining to the community so they can be incorporated into the community's natural hazards mitigation plan. For example, does the local water district have a long term plan to extend water lines in identified floodplain areas? Or does a county have a plan for future bicycle paths that may impact steep slopes or floodplain areas?

Step 5: Choose Planning Model

The fifth step in organizing to plan is to choose an overall planning model. What planning model is the core group going to use? How long will the planning process take? How often should the core group meet? All of these questions should be tackled as early as possible.

Having a clear planning model can help when planning meetings stray from the task at hand. It can be very easy for a core group to get bogged down in very minute details of an issue that may not be relevant to producing the plan. A core group must keep its overall planning goals in mind. Sometimes, a plan will identify problems and actions that another committee or group will need to address.

The DMA2K requires documentation of the planning process used to develop the plan, including how it was prepared, who was involved, and how the public was involved.

Following a planning model, and documenting the results of the planning process, will make writing the draft plan much easier.

Step 6: Decide on Public Outreach Activities

One phrase that is repeated throughout this document is “public outreach.” Any good planning process will have ample public outreach; in fact, DMA2K and Section 8 of this handbook require public input. Public outreach is necessary to obtain input into the plan early in the process and to get “buy-in” from the community.

At this point, a list should be made of the core group’s public outreach efforts: This may include:

- public service announcements
- posting meeting agendas and minutes in public areas (library, community building)
- school programs
- presentations at meetings held by government, civic or other interest groups
- open house
- posters, flyers, and brochures
- media coverage
- news release; public notice
- newsletters
- demonstration projects (i.e. Ohio EMA’s model mitigation house)
- web site

If the core group spends time on public outreach activities, chances are the “surprise factor” will be minimized when the draft plan is completed and public support will be

stronger. The DMA2K requires that there is adequate public participation in the creation of a natural hazard mitigation plan.

Multi-Jurisdictional Plans

Ohio communities may decide to participate in a multi-jurisdictional planning effort. This may be most likely where: nearby communities face similar problems, communities may be in the same watershed, a county or regional planning commission exists, or a county and its communities have similar characteristics (i.e., very rural, agricultural counties). If communities decide to participate in a multi-jurisdictional planning effort, the DMA2K requires representatives from each community must be members of the core group or be participating in the planning process, problems and activities should be developed that apply to each community represented, and the plan should be adopted by each community represented.

SECTION ONE CHECK LIST

- 1. Has local governmental support been obtained?
- 2. Has a diverse core group been formed?
- 3. Have people that will be involved in plan preparation been identified?
- 4. Have other agencies been involved?
- 5. Has a planning model been chosen?
- 6. Has a strategy for public outreach been developed?

SECTION TWO: CONDUCT HAZARD ASSESSMENT

In beginning the planning process, the community must identify the risks from hazards through a comprehensive hazard analysis.

Hazard analysis is the foundation upon which all emergency planning efforts in the community are built. Hazard analysis provides an understanding of the potential threats facing the community. By pinpointing the exact location, extent and magnitude of past disasters, and by examining new or emerging risks, it is possible to determine the probability of such events occurring and the vulnerability of people and property. By reviewing this information along with relevant land use, geographic, economic, and demographic information, local officials can make assumptions about which segments of the community might be impacted by various types of hazards. This in turn allows them to set priorities and goals for mitigation, prior to an incident occurring.

Hazard analysis can be broken down into four basic steps:

1. Identify the hazards.
2. Profile each hazard.
3. Develop a community profile.
4. Conduct a vulnerability analysis and estimate losses.

Step 1: Identification of Hazards

The first step in hazard analysis involves the identification of those natural hazards to which the community is susceptible. The community should consider all types of hazards including, but not limited to:

- Tornadoes
- Floods
- Thunderstorms and lightning
- Severe winter storms
- Wildfires
- Landslides
- Land subsidence

The following sources will assist with the hazard identification process:

Historical records

The community should research local historical data (such as newspaper accounts) to determine the types of hazards the community either has experienced or is susceptible to. Interviewing long-term community residents is another good source of information (refer to Appendix B for tips on interviewing). Another excellent resource might be your

local historical society. Utilizing local information sources is important because they often provide information on those events that may not have been widespread or severe enough to receive national attention, but nonetheless had a significant impact on the community.

Existing plans and reports

The community should review existing reports and plans such as state mitigation plans, hazard identification reports, studies, local emergency response plans, and local comprehensive plans, etc. These plans may list the hazards that can occur or have occurred in the past.

Experts in your community, state or region

The community should contact local, regional, state, and federal sources such as floodplain managers, emergency management staff, police and fire departments, planning departments, state agencies, universities, etc. for existing hazard identification information.

Internet Websites

Information on hazards may also be obtained through the search of Internet websites through the use of keywords such as the name of the community, the type of the hazard, etc.

After you have completed the initial hazard identification in your community, you will then need to focus on the most prevalent hazards. You may be able to eliminate some hazards from further analysis that are not likely to occur in your community (you still want to mention them in your plan). If you are not sure of the chance of a particular hazard occurring, you must attempt to analyze it further.

Further detail of the Hazard Analysis Process is contained in Appendix A, the FEMA State and Local Mitigation Planning how-to guide “Understanding Your Risks”, FEMA 386-2. At the completion of this portion of the hazard analysis you should complete the applicable worksheet(s) in Appendix A.

SECTION TWO – STEP 1 CHECK LIST

- 9 1. Have newspapers and other historical records been searched?
- 9 2. Have existing plans and reports been searched?
- 9 3. Have you talked to experts in your community, state or region?
- 9 4. Have you gathered information from Internet Websites?
- 9 5. Have you prepared a list of the most prevalent hazards in your community?
- 9 6. Have you completed the worksheet(s) in Appendix A?

Step 2: Complete A Profile of Hazard Events

For each potential hazard identified in Step 1 you will need to develop hazard event profiles, which answers the question: *How bad can it get?*

To begin this step you will need to obtain or create a base map to show the areas subject to hazards. The map should be of a scale to show sufficient detail. The base map can be a road map, USGS Topographic Map, USGS Digital Orthophoto Quarter Quad, Aerial Topographic and/or Planimetric Maps, Geographical Information System maps, etc.

After selecting your base map, you will need to gather information for each hazard event profile. For example:

- Obtain flood hazard information from the Flood Insurance Rate Map (FIRM) for your community. Transfer the boundaries of the FIRM onto your base map.
- Obtain earthquake hazard information from the <http://geohazards.cr.usgs.gov/eq/pubmaps/US.pga.050.map.gif> website. Determine and record your Peak Ground Acceleration (PGA) and transfer the boundary of the PGA zones onto your base map.
- Obtain tornado hazard information from the <http://www.fema.gov/mit/tsfsm01.gif> website and transfer the boundary of your Design Wind Speed zones onto your base map.
- Obtain landslide hazard information from known, existing or old landslides. Mark the areas susceptible to landslides on your base map.
- Obtain wildfire hazard information from the http://www.fs.fed.us/land/wfas/nfdr_map.htm website. Determine your critical fire weather frequency and fire hazard severity and draw the boundaries of your wildfire hazards onto your base map.
- Obtain any other hazard information as applicable.

Further detail of this step of the Hazard Analysis Process is contained in Appendix A. At the completion of this portion of the hazard analysis, you should complete the applicable worksheet(s) in Appendix A.

SECTION TWO – STEP 2 CHECK LIST

- 9 1. Have you obtained or created a base map to show areas subject to hazards?
- 9 2. Have you obtained flood hazard event profile information?

- 9 3. Have you obtained earthquake hazard event profile information?
- 9 4. Have you obtained tornado hazard event profile information?
- 9 5. Have you obtained landslide hazard event profile information?
- 9 6. Have you obtained any other hazard profile information as applicable?
- 9 7. Have you transferred the hazard profile event information onto your base map?
- 9 8. Have you completed the worksheet(s) in Appendix A?

Step 3: Develop a Community Profile

To develop a community profile, you must identify and map key areas in the community such as historical resources, industries, critical facilities, active organizations, present and future land uses and development. Information regarding geography, climate, and demographics should also be included in this profile.

During this step you will need to determine how much property and what segment of the population are located in hazard areas. To complete this step you will need to:

- Determine the total number of buildings in your community. This information can be obtained from tax assessment maps, Geographical Information System (GIS), aerial photographs or local planning documents.
- Determine the total estimated value of buildings in your community. This information can be obtained from tax assessments of individual buildings or estimating whole areas.
- Determine the total number of people in your community. This information can be obtained from census data or local data. Note any large seasonal or daily population changes.
- Determine the total number of buildings inside the hazard areas. This information can be obtained from tax assessment maps, GIS, or aerial photographs.
- Determine the total estimated value of buildings inside the hazard areas. This information can be obtained from tax assessment values or estimating whole areas.
- Determine the total number of people inside the hazard areas. This information can be obtained from Census data or local data. Note any large seasonal or daily population changes.
- Calculate the proportion of assets located in hazard areas. To determine the proportion of structures, building value or people in your hazard area, divide the number in the hazard area by the total number or values in your community.

- Determine the location of expected growth in your community by referencing local comprehensive plans or by consulting local officials.

Further detail of this step of the Hazard Analysis Process is contained in Appendix A. At the completion of this portion of the hazard analysis, you should complete the applicable worksheet(s) in Appendix A.

SECTION TWO – STEP 3 CHECK LIST

- 9 1. Have you obtained the total number of buildings in your community?
- 9 2. Have you obtained the total value of buildings in your community?
- 9 3. Have you obtained the total number of people in your community?
- 9 4. Have you obtained the total number of buildings inside the hazard areas?
- 9 5. Have you obtained the total value of buildings inside the hazard areas?
- 9 6. Have you obtained the total number of people inside the hazard areas?
- 9 7. Have you calculated the proportion of assets inside the hazard areas?
- 9 8. Have you obtained expected community growth information?
- 9 9. Have you completed the worksheet(s) in Appendix A?

Step 4: Complete a Vulnerability Analysis and Estimate Losses

To complete the hazard analysis you must determine the vulnerability of the community to the various hazards identified and assessed in the previous steps. Keep in mind that a hazard is only a problem when it can cause harm to people or damage property.

Determining a community's vulnerability is accomplished by:

- Identifying and mapping community hazard areas.
- Developing and applying hazard-specific disaster scenarios to determine critical issues that must be addressed pertaining to specific community sectors, safety, loss of critical functions or facilities, public health impacts, economic impacts, and short and long-term recovery.
- Determining who has the emergency response authority for each identified vulnerability.
- Determining planning and resource allocation needs and considerations for implementing priority activities identified in the previous steps.

The final step in the hazard analysis process is estimating losses that would occur during a hazard event and creating a composite map of the loss areas. To develop loss estimate information you will need to obtain the structures replacement value and multiply it by the expected percent damage from each hazard event. The expected percentage of damage to structures will vary greatly, based upon the age of the building, construction materials used and severity of the hazard. In this step you will need to:

- Determine the extent of damages from floods. The percent of losses will vary depending upon the depth of flooding, whether the structure has a basement and if it is a manufactured home.
- Determine the extent of damages from earthquakes. The percent of losses will vary based upon the type of structure, construction materials and PGA values.
- Determine the extent of damages from tornadoes. The percent of losses will be based on past occurrences of tornadoes and your design wind speed.
- Determine the extent of damages from landslides. The percent of losses will be based upon the location of a structure within the hazard area and past occurrences of landslides.
- Determine the extent of damages from wildfires. Contact your local fire department to estimate these damages. Structures located near the urban-wildland area are most vulnerable.
- Determine the extent of damages from other hazards you identified in your community.

Further detail of this step of the Hazard Analysis Process is contained in Appendix A. At the completion of this portion of the hazard analysis, you should complete the applicable worksheet(s) in Appendix A.

SECTION TWO – STEP 4 CHECK LIST

- 9 1. Have you completed a vulnerability analysis for your community?
- 9 2. Have you created a map of vulnerable areas in your community?
- 9 3. Have you determined the extent of damages from a flood in your community?
- 9 4. Have you determined the extent of damages from an earthquake in your community (if applicable)?
- 9 5. Have you determined the extent of damages from a tornado in your community (if applicable)?
- 9 6. Have you determined the extent of damages from a landslide in your community (if applicable)?
- 9 7. Have you determined the extent of damages from a wildfire in your community (if applicable)?
- 9 8. Have you determined the extent of damages from other hazards you identified in your community?
- 9 9. Have you completed the worksheet(s) in Appendix A?

SECTION THREE: IDENTIFY THE PROBLEM(S)

Do you know what problems are caused by natural hazards? If there are several problems, what are the most important problems? Are some problems really just results of a different, root problem? By identifying and confronting the problems that hazards cause, residents are more likely to understand the threat of future hazards and their impacts on the community. The public must be involved in identifying problems up front, as well as throughout the mitigation planning process.

Problem identification may not be as easy as it sounds. Sometimes, problems may just be symptoms of a deeper, root problem. For instance, flooding by itself is not necessarily a problem (it is a natural process that has been occurring for millions of years) - flooding becomes a problem when it affects people, buildings, or other development.

In this section, the core group will use the worksheets that were developed in the previous two sections to draft problem statements for each identified hazard. There are five steps in this section:

1. Review the hazard analysis and estimated loss worksheets.
2. Determine the “as-is” and “desired state” of your community’s hazard vulnerability.
3. Brainstorm potential problem statements that are preventing your community from reaching its “desired state”.
4. Research and/or develop data that supports your problem statements.
5. Select and rank the problem statements.

Hazard specialists, elected officials, and residents may not agree on what constitutes a hazard problem, its severity, or its sources. Getting the core group to agree on a problem statement or multiple problem statements is the first step in getting agreement on goals and solutions.

When developing problem statements, the core group should be careful to avoid the common pitfalls listed below:

- Making the problem match pre-conceived solutions
- Deciding on a problem statement before effectively analyzing every aspect of the perceived problem
- Failing to gather critical data to support the problem statement
- Tackling problems that are beyond the control or influence of the core group
- Working on problems that are too general, too large, or poorly defined

Step 1: Review the Hazard Analysis and Estimated Loss Worksheets

Step 2: Determine the “As-Is” and “Desired State” of Your Community’s Hazard Vulnerability

The “as-is” state of your community is a description of the vulnerability that existing hazards present. The “desired state” of your community is a description of the level of vulnerability that the community is willing to accept. The purpose of defining the “as-is” and “desired state” is to clarify and quantify the difference between the community’s current hazard vulnerability and the level of vulnerability that the community would like to have. The data needed to determine the “as-is” state should already be complete for your community. The data can be found in the hazard analysis and estimate loss worksheets developed in Section 2.

The “desired state”, or level of vulnerability that the community would like to have, should be zero! Achieving zero vulnerability for some hazards is impossible and the core group should not confuse the “desired state” with the community goals that will be developed in Section 4. Your community’s “desired state” of hazard vulnerability should be a lofty expectation.

The “as-is” and “desired state” should be developed for each hazard identified by the core group. The two can be stated in terms of structures affected, total dollars lost, or any other value that represents vulnerability and makes sense to the core group. The core group will analyze the gap between the “as-is” and “desired state” to help the core group identify the problems that are preventing the community from reaching its “desired state.”

Step 3: Brainstorm Potential Problems

Brainstorm potential problems that are preventing your community from reaching its “desired state”. At this point in the planning process, every perceived problem should be considered and there are no dumb suggestions. Chances are if you are thinking it, someone else is too. Refer to Appendix B for a description of different brainstorming methods.

After brainstorming possible ideas, the core group will want to clarify the problem statements. During this step you must continually ask “why, why, why?” This will allow the core group to “peel back the layers” to find the root cause(s) of the identified problems. Problem statements will describe the reasons why your community has not achieved its “desired state.” During this step try not to give opinions on whether or not a proposed problem statement “truly is the problem.” Step 4 will require the group to obtain data to support or refute proposed problem statements.

Step 4: Research Data to Support or Refute Problem Statements

Start with the research and data that was developed in Section 2. If there are potential problem statements being considered that cannot be supported by data from Section 2, the group will have to do additional research. The core group might decide that the bridge on Main Street is the problem that causes flooding in town. Some citizens might

swear, “It never flooded until that bridge was put in!” This may or may not be true. In this example, the core group could compare historical records of rain events with building and damage records before and after the bridge was built. Maybe there was not a big enough storm to cause flooding in the historical records until after the bridge was built. Perhaps it always flooded in a particular area, but there were no buildings there until after the bridge was built. Or maybe the data supports this argument. The purpose of this step is to gather data that either supports or refutes the proposed problem statements and either restate or develop new problem statements based on facts. Be sure to document all of the facts that are presented to the core group.

Step 5: Select and Rank Problem Statements

In the final step, the core group should select and rank the problem statements that are supported by the data gathered in the previous step. Problem statements that cannot be supported with facts must be discarded. The core group should determine what criteria will be used to rank problem statements and reach consensus on the most important problem statements.

There are several tools that can be used to help the core group determine problem statements. Appendix B details some of the tools that can be used.

SECTION THREE CHECK LIST

- 1. Has the core group developed “as-is” and “desired states” for each identified hazard?
- 2. Has the core group compiled a list of possible problem statements?
- 3. Has the community gathered data that supports or refutes proposed problem statements?
- 4. Has the community selected and ranked problem statements that were supported by facts?

SECTION FOUR: SET GOALS

Now that you have a clear understanding of the problems that your community’s hazards cause, the next step is to identify what goals can minimize or eliminate them. Many existing sources can help you in the process of developing your ideas, some of which may be in conflict with your mitigation focus. Perhaps your community has an economic development plan calling for increased development in a location with high flood or other natural hazard exposures.

If possible, start with the following table that lists plans common to a variety of communities, which may provide some insight for your goals or raise concerns you need to address.

Source	Existing Goal Statements	Effective Goal for Mitigation? (If not, what needs changed)
Comprehensive Plan		
Capital Plan		
Economic Development Plan		
Transportation Plan		

Source	Existing Goal Statements	Effective Goal for Mitigation? (If not, what needs changed)
Emergency Management Plan		
Stormwater Management Plan		
Parks and Open Space		
Others		

So what exactly are goals and activities:

Goals are general guidelines that explain what you want to achieve. They are usually long-term and represent global visions, such as “Mitigate all structures between Elm Street and the river.”

Activities define strategies or implementation steps to attain the identified goals. Unlike goals, activities are specific, measurable, and have a defined completion date. Activities are more specific, such as “Identify and mitigate all repetitive loss structures between Elm Street and the river.”

Establishing mitigation goals and activities becomes simple with a little forethought. For example, your hazard analysis may have identified dwellings or businesses with flooding problems. Let’s assume our community of Smallville has a 100-year flood plain identified with 10 homes within its boundaries:

Goal 1: Mitigate (acquire / elevate / retrofit / relocate) all structures located within known 100-year flood plains in the Village of Smallville.

Smallville also has a history of tornadoes.

Goal 1: Adopt the International Building Code standards for all new construction in Smallville.

Goal 2: Require that all new residences in Smallville include a saferoom.

Keep in mind when developing your goals and activities they should be achievable. For example, setting a goal to eliminate any potential for tornado damage in a high-risk area is unrealistic. Establish realistic goals, like those listed above, to alter building codes to improve building performance during events or requiring saferooms in all future construction.

SECTION FOUR CHECK LIST

1. Have you reviewed all existing planning documents and looked for possible impacts on your mitigation goals?
 - Comprehensive Plan
 - Capital Plan
 - Economic Development Plan
 - Transportation Plan
 - Emergency Management Plan
 - Stormwater Management Plan
 - Parks and Open Space

Others _____

2. Do your goal statements and activities meet the basic requirements?

Achievable ~ Can the goal be met by using mitigation strategies?

Measurable ~ Is there a clear method of showing progress and achievement of the goal?

Effective ~ Will completing the goal reduce or eliminate the hazard?

3. How well do your goals focus your planning efforts on known natural hazards?

Each goal has a unique target

All of the natural hazards in your area are addressed by at least one of your goals

SECTION FIVE: IDENTIFY POSSIBLE ACTIVITIES

Now that the community's mitigation goals have been identified, what activities can be taken to achieve them? Will these activities address the problems created by the hazard? Are they activities that are supported in the community? What are the community's alternatives? This section of the handbook will help you identify activities that address the problems that hazards create in your community. Your proposed actions should clearly help achieve the goals to reduce risk and vulnerability established in the previous section.

Before discussing many of the possible activities that a community can undertake, at this point it is important to emphasize that possible activities do not have to be extremely costly or large in scope. For example, in a southeastern Ohio community, one of the flooding problems identified was storage of materials on the property owned by the railroad that bordered the creek channel. These materials potentially could be a debris hazard during a flood. The village chose to mitigate some of their flooding problem by contacting the railroad and requesting that the materials be stored outside of the flood hazard area.

Mitigation activities costing significant amounts of money are usually funded from combined sources. For example, the HMGP (post-disaster source) can fund property protection activities (i.e., acquisition or elevation of structures) but will not fund the purchase of flood insurance or the construction of levees. As the it selects mitigation activities, the core group should investigate a variety funding sources. Do not let current funding sources (pre or post-disaster) limit your goals or activities.

There are six categories of hazard mitigation activities³:

Preventative activities keep problems from getting worse. The use and development of hazard areas are limited through planning or regulations. These activities are usually administered by building, zoning, planning, and/or code enforcement officials.

Property protection is usually undertaken by property owners on a building-by-building or parcel basis.

Emergency service measures are taken during disaster events to minimize their impact. These measures are usually the responsibilities of city or county emergency management staff.

Structural projects keep hazards away from an area. Structural projects include dams, dikes and levees. These are usually long-term actions and usually having very high up-front costs and on-going maintenance costs.

³ These classifications adapted from the *Natural Hazards Informer*, July 1999

Natural resource protection preserves or restores natural areas or the natural functions of hazard areas. An example of this is a floodplain or wetland area maintained in its natural state.

Public information programs advise property owners, potential property owners, and visitors to hazard areas, as well as protect people and property from them. Public information can also increase people’s awareness to their vulnerability and property risk.

Appendix C contains tables, broken down by hazard type, of many possible mitigation activities. At this point, the core group should refer to the mitigation activity tables and consider each activity for hazards that are significant in the community. To better understand a particular activity in terms of costs, benefits, and drawbacks, the core group should request that people having expertise in that activity speak to the group. Again, contact the Ohio Department of Natural Resources or Ohio Emergency Management Agency for assistance.

SECTION FIVE CHECKLIST

- 1. Possible activities have been reviewed for each hazard
- 2. Potentially feasible activities have been identified
- 3. Information has been gathered and/or experts consulted for each potentially feasible activity for further analysis

SECTION SIX: SELECT THE BEST ACTIVITIES AND DEVELOP ACTION PLANS

Now that the core group has identified all of the possible activities that will reduce hazard damage in your community, it is time to select the activities to include in the plan. Section six has five steps:

1. Identify evaluation criteria grouped by hazard
2. Determine the rating scale to be used
3. Complete matrix
4. Total scores
5. Select activities, create action plan

There are several tools that the core group can use to rank and select the proposed activities. The most common tool used is a “matrix”. Each proposed activity should be evaluated using an appropriate set of criteria. A matrix will allow the core group to rank possible activities based on the same set of criteria using a simple rating scale. Please keep in mind that the group should not use the matrix to make their final decision on the proposed actions that the plan will recommend. Rather, the matrix should be used to stimulate conversation about the pros and cons of each activity, and help narrow the list of activities that the core group will have to consider in its final decision.

It may be helpful to list the pros and cons on a “balance sheet” as the group discusses how to rate each proposed action (refer to Appendix D). A balance sheet will help organize the information and facilitate discussion among the group. The core group should reach consensus on the final decision about which proposed activities will be included in the draft plan. The group should also invite the public to this meeting. It is important for the public to be able to have input on the direction of their community’s hazard mitigation plan. Active public participation in this meeting could prevent having to repeat this step if the draft plan meets strong public opposition.

Step 1: Identify Criteria to Evaluate Activities

The core group should identify the criteria that it will use to evaluate each set of activities based on grouping by hazard. The group should select the criteria based on the values, policies, and environmental/economic realities of the community. The following is the minimum criteria that the core group should consider, the group can always add more:

1. Cost effective
2. Technically feasible
3. Environmentally sound
4. Social impacts

5. Activity addresses the problem
6. Meets federal, state, and local regulations
7. Politically acceptable
8. Activity reduces the risk

One factor to consider when discussing proposed activities is the cost of each activity. Most activities that the core group is considering have been done somewhere, so the group should be able to obtain rough cost estimates for each activity. Cost is an important factor when considering what activities to select. But unless the costs are extreme, it should not be the deciding factor. For example, building Hoover Dam Jr. may help alleviate the community's flooding problems, but the costs may be prohibitive. Some proposed activities may cost very little, but might not be the best alternative to achieve the community's goals. If there is concern over the cost of a project, assign a core group member to research the cost, or invite an expert to evaluate the situation. The group will want to document how and why they decided to include or not include all activities, especially if they are controversial.

The core group can conduct a benefit cost analysis to compare possible mitigation activities. If the benefits of an action are less than the costs, the core group could assign the activity a lower ranking, re-design the activity, or abandon that activity all together. These decisions should be documented because the rational will need to be included in the plan. FEMA has developed training courses, instructional guides, and computer software to assist communities in preparing benefit cost analysis calculations. The FEMA benefit cost analysis hotline can also provide technical assistance (1-800-424-2142 or 1-301-670-3399 extension 710).

It may not make sense to perform a benefit cost analysis for some proposed mitigation activities. For example, it is not practical to evaluate the costs and benefits of an elementary school poster contest to raise awareness of hazards associated with tornadoes. It would also be difficult to quantify the benefits of a community adopting stricter building codes to prevent tornado damage. However, large mitigation projects that require federal or state funding will require a benefit cost analysis as part of the application for funding. The core group should decide what proposed activities can be effectively evaluated by a cost benefit analysis and include the rational in the plan document.

Step 2: Determine Rating Scale

Determine the rating scale that will be used. An example scale might be:

- 5 = Excellent
- 4 = Good
- 3 = Fair
- 2 = Bad

1 = Unacceptable

The core group might choose to use 1-3 instead and use high, medium, and low as descriptors. Whatever rating scale is chosen, the descriptors should be relevant to the criteria and proposed actions.

Step 3: Complete Matrix

The matrix can now be sketched out on a flip chart. It is important to note that agreement should be reached before any values are recorded on the chart. If the core group has difficulty deciding how to rate a particular activity using the selected criteria, they should consider inviting an expert on the particular subject to give a presentation to the group at the next meeting. You can always hold off on rating an activity until the group gathers the data and/or expertise needed to make an informed decision.

	PROPOSED ACTIVITIES			
CRITERIA	Activity 1	Activity 2	Activity 3	Activity 4
Cost Effective	5	3	2	4
Technically Feasible	3	3	4	2
Environmentally Sound	2	3	5	4
Social Impacts	3	3	4	1
Total	13	12	15	11

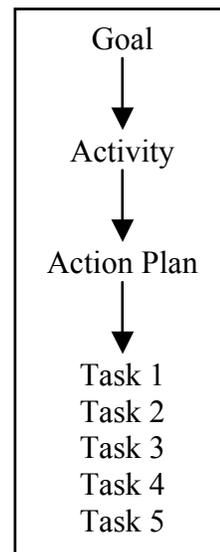
Rating Scale
5 = Excellent
4 = Good
3 = Fair
2 = Bad
1 = Unacceptable

Step 4: Total Scores

After completing the matrix, the core group can decide whether to total the scores. Scoring can be adjusted by giving a particular *weighting* to certain criteria. For instance, scores in the “economically justifiable” criteria might be worth twice the amount of scores in the “technically feasible” criteria. Again, the matrix should not be used to make the final decision. Use the matrix to prioritize and help the core group reach consensus on which proposed activities will be included in the draft plan. **Consensus** does not mean majority rules, or everyone has to agree.

Consensus is a decision that everyone can live with. Consensus has been reached when all the members of a group can say:

- ✓ I believe that you understand my point of view.
- ✓ I believe that I understand your point of view.
- ✓ Whether or not I prefer this decision, I will support it because it was reached open and fairly.



The core group should select proposed activities that:

- ✓ Address the problems identified in SECTION THREE
- ✓ Meet the goals established in SECTION FOUR.
- ✓ Have some chance of getting funded.

Step 5: Select Activities, Create Action Plan

The core group will now need to develop action plans for each activity the group is proposing. The “action plan” is the strategy that the community will use to implement the proposed activities.

First, identify a “lead person”, by title in the plan. This person has the responsibility to ensure that the action plan is successfully carried out. The lead person should be someone with administrative authority since he or she will be responsible for seeing that the action plan is implemented. This person should be identified in the plan by his or her title.

Next, the core group must identify all of the tasks that will be needed to implement each action plan. The following is an example of one community’s action plan and its associated tasks (some of the tasks may have been completed in previous sections):

ACTION PLAN EXAMPLE

Goal: Mitigate structures, with willing owners, in the 100-year floodplain of Shady Creek by April 2005

Activity: Buy-out a repeatedly flooded subdivision

Lead: Village Administrator

Start Date: June 2004

Finish Date: June 2006

Task 1: Identify the structures subject to flood damage

Task 2: Establish damage and frequency relationship for floods

Task 3: Perform a cost/benefit analysis for each structure

Task 4: Identify the interest in buy-outs

Task 5: Identify funding sources

Task 6: Make offers on the structures

Task 7: Close on the structures

Task 8: Demolish the structures

Task 9: Clean up and maintain the property

It is easy to see how one action plan can become eight detailed tasks. The action plans should not list all of the work that will go into completing each task. However, the group should try to identify all the major tasks required to implement the action plan. If a major task is left out, the plan can always be revised. The lead person for each action plan should also be responsible for assigning individuals to certain tasks and offering assistance to be sure they are completed successfully.

The core group should consider the scheduling needs and order of implementation for the tasks. Some tasks are dependent on another task being completed, and some can be completed simultaneously. The core group should determine start and completion dates for each task. These dates are not set in stone, but it is important to have a completion date to strive for. Without a deadline to strive for, the tasks may be set aside and forgotten about, or worse yet, never started! Establishing milestones for multi-year tasks are an effective way to track progress. Issuing progress reports to affected stakeholders can help ensure that tasks are completed correctly and in a timely manner. In addition, the progress reports can be used to obtain support for other mitigation activities.

The group will need to determine what resources are needed to implement each action plan. The core group may need technical experts or legal advice to complete a certain task. Maybe the action plan requires a large piece of earth-moving equipment. Try to identify as many of these resources early on to prevent delays during plan implementation. Always remember to secure the proper permits or approvals needed for any work.

Finally the group will need to consider possible sources of funding. The core group should begin by brainstorming a list of government, private, business, citizen, and non-profit organizations that award grants or donate money. Start with local resources and expand your list to include state and federal sources. Core group members could then divide the organizations up and contact them to inquire about future funding opportunities. Funding for activities that address multiple objectives will be easier to locate and secure. Without adequate funding, some activities may not be executed. Having a natural hazard mitigation plan that is DMA2K compliant will improve your community's chance of securing federal and state funding for mitigation activities.

SECTION SIX CHECK LIST

- 1. Has the core group listed the criteria it will use to evaluate each proposed activity?
- 2. Has the core group completed a matrix that rates proposed activities based on selected criteria?
- 3. Has the core group reached consensus on the activities that will be proposed in the draft plan?

- ❑ 4. Has the core group identified action plans and associated lead person, tasks, and timetable for each activity?
- ❑ 5. Has the core group documented how the action plans will be prioritized, implemented, and administered by the local community?

SECTION SEVEN: PREPARE YOUR DRAFT PLAN

This section is based on a FEMA guidance document that explains the minimum requirements for a DMA2K compliant natural hazards mitigation plan, since it is likely that most communities are preparing plans as a result of this new law. Appendix E contains an excerpt from the FEMA guidance document which illustrates examples of acceptable and unacceptable plan language.

Most of the data needed to prepare the draft plan should have already been developed in previous sections of this guidebook. This section requires the development of one additional item: Appendix F contains an example natural hazards mitigation plan.

Major sections of a DMA2K compliant natural hazards mitigation plan are identified below in bold and subsections are underlined: Plans submitted for state and federal review for DMA2K compliance will be rejected if the major sections in bold (below) are not included.

Documentation of the Planning Process (Developed in Section One)

A description of the planning process should include how the plan was prepared, who was involved in the planning process (and who they represented), and the timeframe for preparing the plan. The plan should document how the core group was formed the number of meetings held, their outcomes, etc. (meeting minutes and or progress reports should be included in the plan).

In addition to the core team preparing the plan, it is also important to indicate how the public participated, including what means (e.g., WebPages, storefronts, toll free phone lines, etc.) were made available to those who could not attend public forums to voice concerns or provide input during the planning process.

A multi-jurisdictional plan (optional), as prepared by regional planning and development authorities (e.g. watershed/river basin commission), is acceptable as a local mitigation plan under DMA2K. However, the plan will be rejected if all of the jurisdictions encompassed in the plan do not participate in its development. Therefore, the plan must document how each jurisdiction participated in the planning process.

Hazard Identification and Risk Assessment (Developed in Section Two)

Local risk assessments must include detailed descriptions of all the hazards that could affect the jurisdiction along with an analysis of the jurisdiction's vulnerability to those hazards. Specific information about numbers and types of structures, potential dollar losses, and an overall description of land use trends in the jurisdiction must be included in this analysis. For multi-jurisdictional plans, any risks that affect only certain sections of the planning areas must be assessed separately in the context of the affected area.

Profiling Hazard Events

The plan should provide a discussion of past occurrences of hazard events in or near the community in terms of their severity and resulting effects. The plan should also describe the analysis used to determine the probability of occurrence and magnitude of

future hazard events. It should also characterize each hazard and include the following information:

- The probability or likelihood that the hazard event would affect an area
- The magnitude or severity of the hazard events
- The geographical extent or areas in the community that would be affected
- The conditions, such as topography, soil characteristics, meteorological conditions, etc., in the area that make it prone to hazards

The analysis should be detailed enough to allow identification of the areas of the jurisdiction that are most severely affected by each hazard.

A composite map should be provided for hazards with a recognizable geographic extent (i.e., hazards that are known to occur in particular areas of the jurisdiction, such as floods, coastal storms, wildfires, and landslides). For those hazards not geographically determined, the plan should indicate their applicable intensity. For example, in areas where tornadoes occur, plans should indicate their maximum wind speed.

Vulnerability Assessment: Identifying Assets and Estimating Potential Losses

This information list should be based on an inventory of existing and proposed structures within the community and/or an estimate of those located within identified hazard boundaries. The information should include critical facilities, such as shelters and hospitals, and infrastructure, such as roadways, water, utilities, and communication systems. The community should determine how best to indicate structures that are vulnerable to more than one hazard.

The plan should include an estimate of losses in terms of dollar amounts for the identified vulnerable assets. An estimate should be provided for each hazard, and should include, when resources permit, structure, contents, and function losses to present a full picture of the total loss for each asset.

Vulnerability Assessment: Analyzing Development Trends

The plan should provide a general overview of land uses and types of development occurring within the community. This can include existing and proposed land uses as well as development densities in the identified hazard areas and any anticipated future changes.

The multi-jurisdictional plan can present information for the general planning area as a whole as described in the previous paragraphs. However, where hazards and associated losses occur in only part of the planning area, this information should be attributed to the particular jurisdiction in which they occur.

Mitigation Strategy (Developed in Sections 4-6)

Natural hazard mitigation plans must include a mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment,

based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This entails the development of goals from which specific mitigation actions and projects will be derived. All mitigation actions must be prioritized based on factors developed by the core group with an emphasis on the action's benefit vs. cost (when possible). For multi-jurisdictional plans, each jurisdiction must show the specific actions they will undertake.

Local Hazard Mitigation Goals (Developed in Section 4)

The community's hazard reduction goals guide the development and implementation of mitigation activities. This section should describe what these goals are and how they were developed. They should also be compatible with the goals of the community as expressed in other community planning documents.

Identification, Analysis, and Prioritization of Mitigation Activities (Developed in Sections 5-6)

The plan should list potential mitigation activities it has identified in its planning process and describe its approach to evaluating these activities to select those that achieve the community's goals. Not all of the mitigation measures identified may ultimately be included in the community's plan due to prohibitive costs, scale, low benefit/cost analysis ratios, or other concerns. The process by which the core group decides on particular mitigation measures must be described in the plan. Although not required, it is strongly recommended that at least one mitigation activity that is fundable under FEMA mitigation programs such as HMGP.

After outlining the mitigation activities to be included in the strategy, the plan should describe the method used to prioritize the order in which they intend to implement them. One evaluation factor that must be included when prioritizing mitigation actions is a benefit cost analysis (when possible).

Action Plan for Mitigation Activities (Developed in Section 6)

The action plan should also identify those policies, programs, or resources that can be used to implement the strategy. Action plans should include an overview of the activity, tasks needed to complete the activity, the implementation timeline, possible funding sources, and the agency or personnel responsible for carrying out the actions.

The multi-jurisdictional plan should contain a section that links the proposed mitigation actions to the applicable jurisdictions. Any jurisdiction within the planning area requesting approval or credit for the Mitigation Plan must be able to point to specific actions to be pursued.

Implementation, Monitoring, and Updating Policies for the Plan (Partially Described in Section 11)

The plan should indicate how mitigation recommendations will be integrated into comprehensive plans, capital improvement plans, zoning and building codes, site reviews, permitting, and other planning tools, where such tools are the appropriate vehicles for implementation. In communities that do not have a comprehensive plan, or

other similar planning mechanisms, the plan should explain how the mitigation recommendations will be implemented.

The plan should describe the community’s process to monitor the plan (this process may require periodic reports by agencies involved in implementing projects or activities; site visits, meetings, the preparation of an annual report, etc.).

The plan should also include a description of how, when, and by whom the plan will be evaluated, and should include the criteria used to evaluate the plan. The evaluation should assess, among other things, whether:

- The goals and objectives address current and expected conditions
- The nature or magnitude of risks has changed
- The current resources are appropriate for implementing the plan
- There are implementation problems, such as technical, political, legal or coordination issues with other agencies
- The outcomes have occurred as expected

Ideally, the plan should be evaluated on an annual basis. If plans are not updated annually, the plan should describe the schedule chosen by the community and provide an explanation for that schedule. Finally, this section must discuss how the public will be involved in maintaining and updating the plan (DMA2K requirement). Plans should describe the how the broader public will be kept involved (e.g., holding strategic meetings, posting the proposed changes to the plan on the web, etc.)

SECTION SEVEN CHECK LIST

Have you addressed all the major points in the plan development process:

- 1. Document the planning process and public participation
- 2. Hazard identification and risk assessment
 - Hazard profiling
 - Identify vulnerable assets
 - Estimate potential losses for vulnerable assets
 - Analyze development trends
 - Multi-jurisdictional hazard identification and risk assessment (if applicable)
- 3. Mitigation strategy
 - Mitigation goals
 - Identify, analyze, and prioritize mitigation actions
 - Creation of action plans for selected mitigation activities
 - Multi-jurisdictional mitigation strategy (if applicable)

- ❑ 4. Implementation, monitoring, and updating policies for plan
 - ❑ Description on implementation policies
 - ❑ Description of processes and procedures for monitoring plan implementation
 - ❑ Description of frequency and process of plan evaluation

SECTION EIGHT: SEEK PUBLIC INPUT; STATE AND FEDERAL REVIEW

Following this planning process involves a certain level of public outreach (including dissemination of information and public input). If public input (or feedback) has been obtained throughout the planning process, the draft plan should reflect the values and goals of many people in the community. However, it is important to gage the opinion of the public and build support for the plan. The best way to do that is to have a formal public input step in the process.

Methods of obtaining public input include town meetings, public hearings and open houses. Questionnaires distributed in utility bills or published in the local newspaper would also provide valuable public input. The technique(s) used to elicit public input should be decided upon by the core group. Also, it is recommended that the core group be actively involved in public input activities.

Although there are several different methods to elicit public comment on the draft plan, one of the most effective is an open house. The open house provides the opportunity to provide reactions, express concerns and offer suggestions to the draft plan. Since the open house is an informal setting, there is more opportunity for one-on-one communication with the persons responsible for developing the plan. The public has the time to familiarize themselves with the plan and any displays the core group has developed.

Tips for holding a successful open house include:

- Hold the meeting in a public building.
- Hold the open house during hours when people are off work.
- Advertise the meeting through various medias.
- Display the process that was used in developing the plan.
- Have core members present that can answer technical questions.
- Have easily understandable displays and handouts.
- Ask that the public provide written commentary and suggestions before leaving the open house.
- Design the open house so that two-way communication is encouraged, such as providing refreshments.

State and Federal Review

In order to be eligible for project funding from FEMA the final plan must be compliant with the DMA2K. Draft plans must be submitted to the Ohio EMA for initial review and coordination. This can be done at the same time the core group is planning its public participation event. Ohio EMA will submit the draft plan to FEMA for review and comment as well.

To begin a DMA2K compliance review, please send the plan with a request for review to:

Ohio Emergency Management Agency
Mitigation Branch
2855 West Dublin Granville Road
Columbus, Ohio 43235-2206

SECTION EIGHT CHECK LIST

- 1. Has date been scheduled for public participation event?
- 2. Has facility to hold public participation event been reserved?
- 3. Agenda created and speakers confirmed?
- 4. Has public notice been provided?
- 5. Has the plan been forwarded to the Ohio Emergency Management Agency for review?

SECTION NINE: PREPARE THE FINAL PLAN

Now it is time to finalize your plan. Because the public has had many opportunities for input throughout the planning process, your public meeting to unveil the draft plan should have gone smoothly. However, the public, Ohio EMA, and FEMA might have identified a few items that were overlooked by the core group.

The core group must establish how the feedback from these groups will be evaluated. The method that the group uses should compare the feedback with the plans goals and activities. Should the feedback be incorporated into the plan (some of the feedback from Ohio EMA and FEMA may be required to be incorporated)? Does the feedback invalidate any of the group's goals or activities? If so, does the goal have to be discarded, or can it be reworked to incorporate the new information? Does the core group have to consider a new goal or possible activity?

When the core group reaches consensus on the draft plan corrections, the corrections should be incorporated into the final plan. If the core group has to make significant changes to the draft plan, it may warrant another public meeting. The core group should decide whether the changes are significant enough to warrant a second public meeting. Even if a second public meeting is not necessary, the core group may want to publicize its process for incorporating feedback using a Questions and Answers fact sheet or some other document.

The group must also plan the production of the final document. Who will write the final document? How many plan documents must be printed, and at what cost? Who should get copies of the document? Will the group charge a fee for extra copies? Will the plan be offered in a digital format? Are there any areas that the law requires the plan be on file, such as the county recorder's office?

In order to be eligible for mitigation funding from FEMA, the final plan must be compliant with the DMA2K. Final, adopted plans must be submitted to the Ohio EMA. After formal adoption by the local community, Ohio EMA will then send the plan and supporting documentation to the FEMA regional office for formal review and approval.

SECTION NINE CHECK LIST

- 1. Has the core group evaluated and addressed the public input?
- 2. Has the core group included the relevant public input in the final plan?
- 3. Has the group developed a plan for the final document production?
- 4. Have Ohio EMA and FEMA certified that the plan is DMA2K compliant?

SECTION TEN: ADOPT THE PLAN

Once the final plan is complete it is necessary for all the governing bodies covered by the plan to adopt it formally. This must be a signed agreement to implement the strategies and processes detailed in the plan.

Adoption by the Local Governing Body

Adoption by the local governing body demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in the plan. Adoption legitimizes the plan and authorizes responsible agencies to execute their responsibilities. The plan must include a copy of the resolution adopting the plan.

Multi-Jurisdictional Plan Adoption

In order for multi-jurisdictional plans to be approved, each jurisdiction that is included in the plan must have its governing body adopt the plan before submission to the state and FEMA, even when a regional agency has the authority to prepare such plans in the name of the respective jurisdictions.

SECTION TEN CHECK LIST

- 1. The plan is adopted by all jurisdictions involved
- 2. Copies of the adoption document(s) are included with your plan
- 3. All affected jurisdictions actively participated in the process
- 4. Has a certified copy of the adopted plan been sent to Ohio EMA for DMA2K final approval?

SECTION ELEVEN: IMPLEMENT, MONITOR AND ADJUST THE PLAN

Once the plan is approved and in place, it is time to implement it! Efforts to complete the mitigation activities identified in action plans that have been developed should be monitored. It is easy to get sidetracked by other important issues and not implement the mitigation activities. Having a monitoring system is one way to ensure that work is being done on the activities. For instance, if a report on the implementation of mitigation activities to the village council is required on a monthly basis, it is likely that somebody will be working on the activities.

Implementing an activity or project identified in the plan, may identify new problems, and/or opportunities that require changes to the plan. The plan should be revised at least on the timetable established within the plan, and adjusted on an as-needed basis in the interim.

Implementation Suggestions

Suggestion # 1: Implement some inexpensive, highly visible demonstration projects. To get the mitigation effort moving, you may want to select a few easy, inexpensive, highly visible projects to implement quickly. Such tangible results will demonstrate to the community that the plan is being taken seriously by community leaders. By doing so, public skepticism may be overcome and new interest in the project created. For your plan to be successful, it is imperative that the local people support your mitigation efforts.

Although quickly implementing some inexpensive and visible projects makes good political sense in helping the mitigation effort progress, make sure that you do not lose sight of more complex projects. These may be more important in reducing the community's overall risk and vulnerability.

Suggestion # 2: Developing a newsletter or a periodic news release plan to inform residents of the mitigation program as projects are implemented or completed, has also been very effective in keeping the lines of communication open between the local government and affected and interested public. The implementation process goes much more smoothly when people are aware of what's happening.

Suggestion # 3: Hire a project coordinator. As a final suggestion, you may want to consider hiring a project manager or hazard mitigation coordinator to manage and oversee workflow. Duties of the coordinator include: working with contractors, acting as a liaison between the property owner and local government, writing newsletters, conducting other public information duties, and performing other duties related to project development and implementation. It is important that the person hired for this position understand the goals and objectives of the project because he or she will have to personally communicate this information to members of the community.

Planning doesn't stop once you have initiated your plan. Communities are dynamic entities. They grow and change over time. To avoid becoming obsolete and void, plans must also grow and evolve over time to be effective. If a hazard mitigation plan is to succeed, it is important to update the plan periodically. Developing a monitoring system can be a useful tool to aid you in this process.

Utilizing a monitoring system also serves another purpose. It helps keep your plan running on schedule even when there are other jobs and duties to perform. Local officials wear many different hats and are responsible for multiple assignments. Few have the luxury of focusing on only one task or project at a time. Therefore, the community should adopt a monitoring system to keep people and the plan, on task and on time. This section suggests how to develop a monitoring system to update your community's hazard mitigation plan and keep your plan running on schedule.

Adjustments or revisions are a necessary part of any plan. There are always some contingencies that cannot be foreseen, or events, which could not be predicted. Revisions incorporate those changes necessary to better fit the plan into real-life situations. Revision of mitigation plans also ensures that as the community's needs change, so does the plan, employing the latest and most effective mitigation techniques. Your community's plan should be updated and revised at least once each year, and DMA2K guidelines require the plan be updated at least once every five years.

As with any project you will want to evaluate your project's effectiveness. A brief annual report helps chart progress in meeting your community's goals and objectives. Additionally, a periodic update newsletter can be produced.

APPENDIX A:

FEMA State and Local Mitigation Planning how-to Guide “Understanding Your Risks” (FEMA 386-2)

This document can be ordered by contacting FEMA at 1-800-480-2520 or can be viewed / downloaded on-line at http://www.fema.gov/fima/planning_toc3.shtm

APPENDIX B

APPENDIX B: TOOLS TO FACILITATE THE GENERATION OF IDEAS

The methods for generating ideas outlined below are adapted from the Quality Service through Partnership, Tool Kit for Quality, produced by the State of Ohio Office of Quality.

Brainstorming

Brainstorming is a method to generate input in a team setting. In a brainstorm situation people should express their ideas the moment they think of them. Brainstorming is an informal process in which:

- No one evaluates the ideas as they are announced.
- Wild ideas are encouraged.
- People build on the ideas of others.
- Everyone strives for quantity. The more ideas, the better.

There are three methods of brainstorming. The most familiar is “freewheeling”, in which:

- Team members call out their ideas spontaneously.
- The scribe records the ideas as they are suggested.

In “round-robin” brainstorming:

- The leader or scribe asks each member, in turn, for an idea.
- Members may pass on any round.
- The session continues until all members have passed during the round.
- Ideas are recorded on a flip chart.

The “slip method” differs markedly from the other two approaches:

- The leader asks members to write down their ideas on small slips of paper or index cards.
- The ideas are then collected and organized.

Interview

The interview is a structured technique for collecting information from individuals or groups. Interviewing can be a very effective way to learn about citizen needs and expectations.

The following are some suggestions for conducting a successful interview:

- Before the interview, develop a list of questions. Ideally, the questions should be developed in a group setting.
- Be sure to include follow-up questions to get the information you really need.
- If possible, bring along a note taker or a tape recorder so that the interviewer can concentrate on asking questions.
- Verify your understanding of the interviewee’s responses. Restate what you are hearing and ask whether your interpretation is accurate.

Surveying

Surveying is similar to interviewing. The difference is that the interviewee’s response is recorded on paper. The major advantage is that you can get a great deal of information from many people, and it is inexpensive. The disadvantage is that people may interpret the questions differently than intended. Their answers may be ambiguous and there is no opportunity to test understanding.

Follow these simple suggestions to develop a successful survey:

- Identify the information you need.
- Decide who has the information in its most reliable form.

- Plan how you will use the information once you have gathered it.
- Develop a series of questions that will enable respondents to provide the information accurately and unambiguously.
- Keep the questionnaire short, simple, and clear.
- Try out the questions with several people to uncover and unclear questions. Conduct a “test survey” to work out the bugs.

Questions can be “closed”, which means there is a limited number of responses to choose from. An “open” survey question allows the person being surveyed to develop their own response.

APPENDIX C

APPENDIX C: POSSIBLE MITIGATION ACTIVITIES

HAZARD TYPE: MULTIPLE NATURAL HAZARDS (CAN APPLY TO ONE OR MORE HAZARDS)		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
Natural hazards mitigation planning (preventative)	<p>Natural hazards mitigation plans document natural hazards and their impacts on a community, integrate problems associated with natural hazards, identify goals to mitigate natural hazards, and develop specific action plans. Natural hazards mitigation plans can be stand alone or be integrated into a community's comprehensive plan. Also, natural hazards mitigation plans can be multi-jurisdictional provided all participating communities participate in the planning process and adopt the plan.</p> <p>If the community participates in the Community Rating System, credit is given to natural hazards mitigation plans that identify flooding as a hazard. Natural hazards mitigation plans must be compliant with the Disaster Mitigation Act of 2000 if a community desires funding for specific mitigation projects from FEMA.</p>	<p>Local sources of help include: village, city or county planning office, county emergency management agency (hazards and emergency response planning), Ohio State University extension offices, watershed coordinators, regional economic development districts, and private consultants.</p> <p>OEMA, Mitigation Branch (614) 889-7152, www.state.oh.us/division/ema</p> <p>ODNR, Division of Water (614) 265-6750, www.dnr.state.oh.us</p>
Comprehensive planning (preventative)	<p>The comprehensive plan, also known as a master plan, or the general plan, is a blueprint for future physical development of a community including parts typically covering areas like population and demography, land use, traffic and circulation, parks and open space, housing, utilities, social programs and general cultural characteristics. Like the natural hazards mitigation plan, the comprehensive plan identifies community issues or problems, identifies community goals and develops action plans.</p> <p>The comprehensive plan enables a community to shape its environment based on principles and thought-out objectives. Also, the comprehensive plan is the legal basis for other enacted land use controls including zoning and subdivision regulations.</p> <p>A comprehensive plan may include a chapter on natural hazards that is integrated with the plan. Such integration would allow overall community goals and action plans to be shaped by natural hazards concerns.</p>	<p>Local sources of assistance include: village, city or county planning office or planning commission, regional planning commissions or organizations, and local universities that have city and regional planning programs. Also, several private consultants assist communities with comprehensive planning</p> <p>The Ohio Planning Conference (www.ohioplanning.org) is a statewide non-profit organization dedicated to planning education and training, hosting regional and state conferences / training opportunities annually.</p> <p>Several excellent books and information about comprehensive planning can be found on the American Planning Association (APA) website: www.planning.org.</p>
Capital improvement planning (preventative)	<p>A capital improvements plan is a systematic way of identifying, evaluating, reviewing and prioritizing services or facilities provided by a government and paid for with public funds. This may include the construction and maintenance of water and sewer systems, streets, sidewalks, parks, fire and police stations, and municipal buildings. Through capital improvement planning, decisions to fund capital improvements can be linked to or prioritized by community natural hazard mitigation goals.</p> <p>For instance, the capital improvements plan may indicate that utilities should not be placed in landslide prone areas, all</p>	<p>Local sources of assistance include: village, city or county planning office or planning commission, and regional planning commissions or organizations. Also, many several private consultants can assist communities with capital improvements planning.</p> <p>Several excellent books and information about comprehensive planning can be found on the American Planning Association (APA) website: www.planning.org.</p>

HAZARD TYPE: MULTIPLE NATURAL HAZARDS (CAN APPLY TO ONE OR MORE HAZARDS)		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
	municipal buildings avoid the floodplain area, and the sewer system not extend into hazard areas.	
Zoning regulations (preventative)	<p>Zoning regulations consist of dividing a community into districts or zones and regulating within such districts the use of land and the use, heights, and areas of buildings for the purposes of promoting health, safety, morals and general welfare. Zoning is an instrument to carry out the comprehensive plan, thus, zoning is most effective when used in conjunction with a comprehensive plan.</p> <p>Many Ohio cities, villages and townships have enacted zoning regulations. Zoning regulations may include hazard and sensitive areas overlay districts (i.e., floodplain, steep slope, aquifer protection) that limit uses such as residential structures, storage of materials, community facilities, fill, etc., and impose stringent construction standards in those districts.</p>	<p>Local sources of assistance include: village, city or county planning office or planning commission, and regional planning commissions or organizations. Also, many several private consultants can assist communities with capital improvements planning.</p> <p>The Ohio Planning Conference (www.ohioplanning.org) is a statewide non-profit organization dedicated to planning education and training, hosting regional and state conferences / training opportunities annually.</p> <p>Several excellent books and information about comprehensive planning can be found on the American Planning Association (APA) website: www.planning.org.</p>
Subdivision regulations (preventative)	<p>Counties, cities and villages can adopt subdivision regulations. Subdivision regulations govern the division and development of land in order to achieve orderly and harmonious development. Some communities have included provisions to lessen the impact of flooding within the subdivisions and on future homeowners. Standards such as requiring natural ground above the floodplain for building sites and access, minimization of off-site stormwater increases have been adopted, and requirements to show floodplain boundaries on subdivision plats.</p>	<p>Local sources of assistance include: village, city or county planning office or planning commission, and regional planning commissions or organizations. Also, many several private consultants can assist communities with capital improvements planning.</p> <p>The Ohio Planning Conference (www.ohioplanning.org) is a statewide non-profit organization dedicated to planning education and training, hosting regional and state conferences / training opportunities annually.</p> <p>Several excellent books and information about comprehensive planning can be found on the American Planning Association (APA) website: www.planning.org. Two books specifically recommended are: <i>Subdivision Design in Flood Hazard Areas</i>, (PAS 473) by Maya Morris and <i>Conservation Design for Subdivisions</i>, by Randall Arendt.</p> <p>For subdivision standards to reduce the impact of flooding, contact ODNR, Division of Water (614) 265-6750, www.dnr.state.oh.us</p>
Building code development and enforcement (preventative)	<p>Changes in the state building code effective in 2002, require that 4+ family residential, commercial, and industrial structures be flood protected (elevated or dry floodproofed). Communities can adopt a 1-3 family residential building code and incorporate flood protection measures.</p>	
Hazard Mitigation Grant Program (HMGP) Project	<p>HMGP projects are designed to protect structures from natural hazards through a variety of techniques. The projects are developed by the community, require at least 25% local match, and are implemented locally. Hazard mitigation grant</p>	<p>OEMA, Mitigation Branch 614-889-7152, www.state.oh.us/division/ema</p> <p>FEMA</p>

HAZARD TYPE: MULTIPLE NATURAL HAZARDS (CAN APPLY TO ONE OR MORE HAZARDS)		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
(property protection)	projects for flood hazards usually involve one or more of the following property protection activities: Acquiring and demolishing structures, elevating structures, retrofitting structures.	www.fema.gov
Emergency Response Planning / Emergency Operations Plan (emergency service measure)		
Evacuation (emergency service measure)		
Critical facilities protection (emergency service measure)	Whether at the site design and planning stage or in long range capital improvements planning, critical facilities protection is the incorporation of mitigation techniques to a class of structures – critical facilities – that are essential to the function of a community or that house people that have difficulty escaping in the event of a disaster (i.e., schools, hospitals, wastewater treatment facilities, jails, elderly housing facilities)	OEMA, Mitigation Branch (614) 889-7152, www.state.oh.us/division/ema For flood related critical facility protection: ODNR, Division of Water (614) 265-6750, www.dnr.state.oh.us
Hazard maps and data (public information)		
Library resources (public information)		
Technical assistance (public information)		
Fact sheets, brochures, PSAs (public information)		
Informational workshops (public information)		

HAZARD TYPE: FLOOD		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
Open space preservation (preventative / natural resource protection)	[Farmland preservation tools, conservation easements]	Division of Soil and Water Conservation
Flood damage reduction regulations (preventative)	Over 700 Ohio communities participate in the National Flood Insurance Program. As a NFIP participants, most communities (cities, villages or counties – no townships) have adopted a special purpose ordinance or resolution that establishes development standards in Special Flood Hazard Areas (also known as 100-year floodplains). Model special purpose regulations produced by ODNR, Division of Water, include minimum development standards. Over 240 Ohio communities have included higher, more stringent development standards in their flood damage prevention regulations. These higher standards range from fill restrictions, to freeboard elevations for all structures.	ODNR, Division of Water's <i>Ohio Floodplain Regulation Criteria</i> includes the minimum standard model and optional higher standards. Call (614) 265-6750 or check out the ODNR website at www.dnr.state.oh.us/water .
Stormwater management program (preventative)	Stormwater management programs can take a variety of forms. Some communities have stormwater management regulations built into their subdivision regulations. Others have a stand-alone stormwater management code. Recent changes in state law have allowed for the creation of county stormwater management utilities. NPDES phase II regulations require XXXX...[Contact Jerry Wager or Dan Mecklenberg. For more info].	ODNR, Division of Soil and Water Conservation (614) xxx-xxxx.
Drainage system maintenance (preventative)	[Community maintenance plan, community clean-up, petition ditch projects.]	
Beach maintenance (preventative)	[Lake Erie stuff]	
Floodplain Mapping (preventative / public information)	Floodplain mapping is essential to proper floodplain management or other land-use regulations. Detailed flood studies identifying base flood elevations and floodway areas are much better than approximate floodplain boundary delineations. One type of floodplain mapping, high water marking and inundation mapping can be done after a significant flood in a community, can be used as regulatory flood elevations if no flood elevations existed previously, and is relatively low or no cost.	ODNR, Division of Water (614) 265-6750 www.dnr.state.oh.us
Future conditions flood mapping (preventative /	Flood maps, which are the basis of floodplain overlay zoning or flood damage prevention regulations are based on future development conditions. This activity requires detailed engineering studies of each watercourse that accounts for future development conditions. Also requires community has	ODNR, Division of Water (614) 265-6750 www.dnr.state.oh.us

HAZARD TYPE: FLOOD		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
public information)	a comprehensive plan and future land use map.	
Erosion Zone Mapping / Regulations (preventative / public information)	Primarily for coastal areas, erosion zone mapping is an activity that has been completed for the shoreline of Lake Erie.[more]	
Community Rating System (preventative)	Communities can participate in this voluntary program that can result in flood insurance discounts for all citizens in the community. Points are given for when the community implements different floodplain management strategies.	
Flood Mitigation Assistance (FMA) Program Project (property protection / preventative)	The projects are developed by the community, require at least 25% local match, and are implemented locally. FMA projects for flood hazards usually involve one or more of the following property protection activities: Acquiring and demolishing structures, and elevating structures.	OEMA, Mitigation Branch 614-889-7152 www.state.oh.us/division/ema
Structural relocation (property protection)	Removal of structure from a flood prone site and relocating it to a non-flood prone site. Requires relocation contractor and involves jacking a structure up, placing it on a wheeled vehicle, and delivery to a new site. The original foundation cannot be moved so it must be demolished and a new foundation is built on the new site. One story frame buildings usually easiest to move, especially if on a crawlspace or basement. Two or more story houses and masonry houses are more difficult, and costlier, to move. Relocation can be funded by HMGP, FMA, and Increased Cost of Compliance coverage as part of a flood insurance policy.	Local building elevation / relocation contractor ODNR, Division of Water (614) 265-6750 www.dnr.state.oh.us FEMA website: www.fema.gov/mit <i>Homeowner's Guide to Retrofitting (FEMA 312)</i> To order: 1-800-480-2520
Structural elevation (property protection)	Elevating a house to prevent flood waters from reaching living areas is an effective mitigation method. The goal of the elevation process is to raise the lowest floor to or above the flood protection elevation. This can be done by elevating the entire house, including the floor, or by leaving the house in its existing position and constructing a new, elevated floor within the house. This usually depends on construction type, foundation type, and flooding conditions. Generally frame buildings on crawl spaces are the most inexpensive to elevate. Masonry buildings on slab foundations are the most expensive. Advantages to this method is that a person does not have to relocated to another area, and the community does not lose property taxes, sewer/water fees, etc. Disadvantages are that the structure may be isolated during a flood, and a flood,	Local building elevation / relocation contractor ODNR, Division of Water (614) 265-6750 www.dnr.state.oh.us FEMA website: www.fema.gov/mit Publications: <i>Protecting Building Utilities from Flood Damage (FEMA 348)</i> <i>Homeowner's Guide to Retrofitting (FEMA 312)</i> To order: 1-800-480-2520

HAZARD TYPE: FLOOD		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
	larger than what was designed for, may occur. Elevation can be funded by HMGP, FMA, and Increased Cost of Compliance coverage as part of a flood insurance policy.	<i>Flood Proofing Technology in the Tug Fork Valley (US Army Corps of Engineers Floodproofing Committee)</i>
Structural acquisition / demolition (property protection)	Voluntary purchase of structure, usually by local government. After the structure is purchased, it is demolished, the lot is graded and planted with vegetative cover, and is deed restricted to allow only open space uses. Acquisition / demolition can be funded by HMGP and FMA. Increased Cost of Compliance coverage as part of a flood insurance policy can pay for demolition only.	
Structural retrofitting (property protection)	This activity describes a broad range of activities that are measures to protect a structure, or parts of a structure from flooding. These measures include are wet floodproofing of non-habitable areas of a structure; dry floodproofing or making a structure watertight; elevation or relocation of utilities such as furnace, water heater, HVAC, electric panel, or air conditioner; and/or construction of a "utility closet" to house relocated utilities.	ODNR, Division of Water (614) 265-6750 www.dnr.state.oh.us FEMA website: www.fema.gov/mit Publications: <i>Protecting Building Utilities from Flood Damage (FEMA 348)</i> <i>Homeowner's Guide to Retrofitting (FEMA 312)</i> To order: 1-800-480-2520
Flood Insurance (property protection)	Flood insurance can offset the financial devastation of flood damage. Standard homeowner's policies do not cover flood damage. Flood insurance policies can be purchased by any property owner or renter in communities that participate in the NFIP. NFIP insurance limits are \$250,000 for residential structures and \$500,000 for non-residential structures and additional coverage is available through several insurance companies. Contents coverage is also available. NFIP policies also have an Increased Cost of Compliance provisions that pays up to \$20,000 additional costs if flood damaged structure must comply with local floodplain regulations.	Local property and casualty insurance agent ODNR, Division of Water (614) 265-6750 www.dnr.state.oh.us National Flood Insurance Program 1-800-427-4661. www.fema.gov/nfip
Flood warning systems (Emergency service measure)		
Dam condition monitoring (emergency service measure)		

HAZARD TYPE: FLOOD		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
Rainfall and river stage monitoring (emergency service measure)		
Reservoirs (structural project)		
Dry dams (structural project)		
Levees and floodwalls (structural project)		
Diversions (structural project)		
Channel modifications (structural project)		
Storm sewers (structural project)		
Wetlands protection (natural resource protection)		
Erosion and sediment control (natural resource protection)		
Best management		

HAZARD TYPE: FLOOD		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
practices (natural resource protection)		
Real estate disclosure information		
Signage		

HAZARD TYPE: TORNADO / SEVERE WINDS		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
Safe room construction		
Manufactured home tie-downs	Proper tie-downs with the correct number and type of ground anchors for a particular soil type can reduce damage to manufactured homes	
Burying power lines	Buried power lines offer the security of uninterrupted power during and after windstorms and tornadoes.	
Backup power resources	Can enable facilities to continue basic services, can also be used by businesses to ensure security and protect refrigerated goods.	
Tree management	By pruning trees around power lines, the potential of trees falling on power lines may be reduced	

HAZARD TYPE: LANDSLIDES / STEEP SLOPES		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
Drainage control regulations (preventative)	Similar to stormwater management regulations, by regulating drainage a community can reduce the impact of saturated soils on landslides.	
Grading ordinances (preventative)	Requires developers and landowners to obtain permits prior to filling or regarding.	
Hillside development ordinance	A special purpose ordinance that supplements drainage ordinances, building codes, subdivision regulations and zoning ordinances. Sets specific standards for construction on the sides of hills.	
Open space designations	Keeps landslide prone areas undeveloped	
Vegetation placement and management plans	Various types of vegetation increase the stabilization of soils through their root strength and by interception of precipitation. By using certain types of vegetation, soil stability can be increased. Management plans are aimed at ensuring the establishment of long-term maintenance of vegetation appropriate for an area.	
Restraining structures	Structural measures that hold back earth and prevent landslides from occurring.	
Structural relocation	Moving structures to safer, more stable sites	
Structural acquisition / demolition	Purchase and demolishing structures located on landslide prone sites.	
Steep slope mapping	Maps that identify areas susceptible to landslide events. Soil types, slope percentage, drainage or other critical factors are used to determine such areas. Maps are used by communities, developers, and residents to make informed decisions.	

HAZARD TYPE: MINE SUBSIDENCE		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
Ohio mine subsidence insurance program		
Mapping of underground mine areas		ODNR, Division of Mineral Resources Management

HAZARD TYPE: WILDFIRE		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
Fuel management	Encourage efforts to reduce the available fuel that promotes wildfires. Encourages the use of fire-resistant vegetation, fuel breaks and firebreaks	ODNR, Division of Forestry
Promotion of defensible space	A manageable area, generally 30 to 100 feet around a structure, that is cleared of combustible materials.	
Dry hydrants	In rural areas, where water sources for firefighting may be scarce, dry hydrants using local ponds or other water sources can be used.	

HAZARD TYPE: EARTHQUAKE		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:
Seismic hazard mapping	This is a two step process. The first step is the collection of geologic information on seismic sources, soil conditions and related hazards that might occur. The second step is to prepare a map showing the approximate location of the seismic hazard. This information can be uses to establish vulnerability and assess risk.	
Loss estimation studies	After seismic hazards ...	Division of Soil and Water Conservation
Retrofitting structures		

HAZARD TYPE: SNOW AND ICE STORMS		
MITIGATION ACTIVITY / CATEGORY	DESCRIPTION	FOR FURTHER INFORMATION:

APPENDIX D

APPENDIX D: TOOLS FOR REACHING CONSENSUS

The methods for reaching consensus outlined below are adapted from the “Quality Service through Partnership, [Tool Kit for Quality](#)”.

Balance Sheet

Balance sheets allow a group to identify and review the pros and cons of various options. Like the other tools for reaching consensus, a balance sheet should not be used to make a decision. They will however organize the information and facilitate discussion among the group.

On a flip chart, draw a large grid consisting of two columns and a row for each of the options being discussed. Label the columns + and – (or “pros” and “cons”). The team should then fill in each cell of the grid, brainstorming and reaching consensus on positive and negative aspects for each option.

The balance sheet below was used to identify the pros and cons of two different retrofitting measures to mitigate flood damage to a residential home. This list is not extensive, but is used to illustrate the point.

Retrofitting Method	Pros	Cons
Levees and Floodwalls	<ul style="list-style-type: none"> -No significant changes to the house will be required -The house can be occupied during construction -Reduced risk to the house and its contents 	<ul style="list-style-type: none"> -Cost may be prohibitive -Periodic maintenance is required -Levees and flood walls do not always result in reduced insurance rates -A large area may be required for construction
Elevation of Structure	<ul style="list-style-type: none"> -Should result in compliance with floodplain regulations -Reduces the risk to the house and it’s contents -Often reduces flood insurance premiums -Elevation techniques are well known by contractors 	<ul style="list-style-type: none"> -Cost may be prohibitive -The appearance of the house may be adversely affected -Potential wind and earthquake loads must be considered in the design -Access to the home may be adversely affected

Decision Matrix

A matrix is another tool that can be used to help the group reach consensus on a difficult decision. See Section Six for a discussion on how to develop a matrix.

Weighted Voting

This tool enables teams to quantify the various positions and preferences of team members. It differs from a matrix in two ways: first, no decision factors or criteria are used: second, individual member’s votes are recorded, there is no discussion or effort to reach agreement on a single number.

On a flip chart, draw a grid as shown below. Give each person a number of votes to distribute in accordance with their preference. The number of votes should be about 1½ times the number of options. Members then decide how to distribute their votes among the options to indicate their relative preferences. Team members should be encouraged to spread their votes to represent their feelings about the options, rather than lump all their votes on a single favorite. Members should decide how they

are going to distribute their votes (preferable jotted down on paper) before any votes are recorded on the chart. The recorder should ask for and record votes by option, not by person. This will help the team see where there is agreement.

Team Members	Option 1	Option 2	Option 3	Option 4
Rick	4	1	1	0
Chad	3	0	1	2
Janice	1	0	1	4
Totals	8	1	3	6

Weighted voting does not make decisions. It merely provides information about where individual members stand and how strongly. This information makes it easier to bring opposing viewpoints to the surface. Opposing viewpoints must be discussed to achieve consensus.

Some people prefer not to total the numbers of each option. By not totaling the options, the group guards against the risk that weighted voting will become just another win-or-lose outcome. The team is the decision maker, not the tool.

APPENDIX E

FEMA GUIDANCE FOR PREPARING LOCAL MITIGATION PLANS

Local Mitigation Plan requirements in §201.6 of the Interim Final Rule (Rule) apply to both local jurisdictions and Indian tribal governments (henceforth referred to as local jurisdictions). The local mitigation planning requirements in this section encourage agencies at all levels, local residents, businesses, and the non-profit sector to participate in the mitigation planning and implementation process. This broader public participation enables the development of mitigation measures that are supported by these various stakeholders and reflect the needs of the community. Private sector participation, in particular, may lead to identifying local funding that would not otherwise have been considered for mitigation activities.

The Rule criteria for the local plans require that communities only address natural hazards.

States are required to coordinate with local governments in the formation of hazard mitigation strategies, and the local strategies combined with initiatives at the State level form the basis for the State Mitigation Plan. With the information contained in local mitigation plans, States are better able to identify technical assistance needs and prioritize project funding. Furthermore, as communities prepare plans, States continually improve the level of detail and comprehensiveness in Statewide risk-assessments.

Local jurisdictions must have approved plans by November 1, 2003 to be eligible for Hazard Mitigation Grant Program funding for Presidentially-declared disasters after this date.

The Sections covered in Part 3: Local Mitigation Plans include:

- 3.1 Prerequisites;
- 3.2 Planning Process;
- 3.3 Risk Assessment;
- 3.4 Mitigation Strategy; and
- 3.5 Plan Maintenance Procedures.

3.1 PREREQUISITES

The local government submitting the plan must satisfy the following three prerequisites before the plan is reviewed by the State and/or FEMA. If these prerequisites have not been fulfilled, the plan cannot be reviewed.

3.1.1 ADOPTION BY THE LOCAL GOVERNING BODY

**Requirement
§201.6(c)(5)**

[The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, county Commissioner, Tribal Council)...

Explanation:

Adoption by the local governing body demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in the plan. Adoption legitimizes the plan and authorizes responsible agencies to execute their responsibilities. The plan must include a copy of the resolution adopting the plan.

Resource:

For more information about adopting the mitigation plan, see:

- ✓ *Bringing the Plan to Life* (FEMA 386-4) **AVAILABLE FALL 02.**

Scoring:

- Not Met. The plan has not been formally adopted by the local governing body.
- Not Met. The plan has been formally adopted by the local governing body, but a copy of the signed plan adoption resolution is not included.
- Met. The plan has been formally adopted by the local governing body and a copy of the signed plan adoption resolution is included.

3.1.2 MULTI-JURISDICTIONAL PLAN ADOPTION

Requirement §201.6(c)(5)	For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.
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Explanation: In order for multi-jurisdictional plans to be approved, each jurisdiction that is included in the plan must have its governing body adopt the plan before submission to the State and FEMA, even when a regional agency has the authority to prepare such plans in the name of the respective jurisdictions.

Resource: For more information about adopting the mitigation plan, see:
 ✓ *Bringing the Plan to Life* (FEMA 386-4). **AVAILABLE FALL 02.**

- Scoring:**
- Not Met. The plan has not been formally adopted by each local governing body.
 - Not Met. The plan has been formally adopted by the local governing body, but a copy of the signed plan adoption resolutions is not included.
 - Met. The plan has been formally adopted by each local governing body and a copy of each of the signed plan adoption resolutions is included.

3.1.3 MULTI-JURISDICTIONAL PLANNING PARTICIPATION

**Requirement
§201.6(a)(3)**

Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process... Statewide plans will not be accepted as multi-jurisdictional plans.

Explanation:

A multi-jurisdictional plan, as prepared by regional planning and development authorities (e.g. watershed/river basin commission), is acceptable as a Local Mitigation Plan under DMA 2000. However, the plan will be rejected if all of the jurisdictions encompassed in the plan do not participate in its development. Therefore, the plan must document how each jurisdiction participated in the planning process.

Resource:

For more information on initiating a comprehensive local mitigation planning process, see:

- ✓ *Getting Started* (FEMA 386-1). **AVAILABLE FALL 02.**

Scoring:

- Not Met. Not all of the affected jurisdictions actively participated in the planning process.
- Met. All of the affected jurisdictions actively participated in the planning process.

3.2 PLANNING PROCESS

§201.4(b) and §201.4(c)(1) require that there be an open public involvement process in the formation of a plan. This includes opportunities for the public to comment on the plan at all stages of its formation, and the involvement of any neighboring communities, interested agencies, or private and non-profit organizations. This should also include a review of any existing plans or studies and incorporation of these if appropriate. Documentation of the planning process, including how the plan was prepared, who was involved in the process, and how the public was involved is essential.

This section includes the following subsection:

- 3.2.1 Documentation of the Planning Process

3.2.1 DOCUMENTATION OF THE PLANNING PROCESS

IFR Requirement §201.6(c)(1):

[The plan must document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Explanation:

A description of the planning process should include how the plan was prepared, who was involved in the planning process, and the timeframe for preparing the plan.

The plan should document how the planning team was formed and the number and outcomes of the meetings the planning team held. Ideally, the local mitigation planning team is composed of local, State, and federal agency representatives, as well as community representatives, local business leaders, and educators.

In addition to the core team preparing the plan, it is also important to indicate how the public (residents, businesses, and other interested parties) participated, including what means (e.g., WebPages, storefronts, toll free phone lines, etc.) were made available to those who could not attend public forums to voice concerns or provide input during the planning process.

Resource:

For more information on the planning process; ideas on finding stakeholders, generating public interest, enlisting partners, and choosing an appropriate public participation model; and advice to local governments seeking to initiate a comprehensive local mitigation planning process, see:

- ✓ *Getting Started* (FEMA 386-1). **AVAILABLE FALL 02.**

Examples:



Original Submittal:

Friendly County has developed a local hazard mitigation plan. The county Planning Department was responsible for development of the plan. The Planning Department formed a planning team comprised of representatives from FEMA Region XX, State government, local City governments, community groups, local businesses, and State University, which is located in Friendly County. The plan was developed over one year.

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.2.1		<ul style="list-style-type: none"> The planning process included representatives from many organizations, but there is no mention of public involvement or details on the planning process.

Required Revisions:

To receive a satisfactory score, the plan must include specifics on the planning process and discuss public involvement.



Revised Submittal:

Friendly County has developed a local hazard mitigation plan. The county Planning Department was responsible for development of the plan. The Planning Department formed a planning team comprised of representatives from FEMA Region XX, State government, local City governments, community groups, local businesses, and State University, which is located in Friendly County (see Appendix XX for a list of team members). This team met every two weeks for three months and once a month thereafter. The plan was developed over one year.

An effort was made to solicit public input during the planning process and three public meetings were held during the formation of the plan: one at the beginning, one after a first draft was produced, and one after a final draft was produced. Citizens could also access the county Hazard Mitigation Plan website to provide input.

The State University assisted greatly in the development of the plan by providing graduate students from the Urban Studies and Planning Department to help county Planning Department Staff. These students helped organize the public meetings and maintained the website.

Feedback received from the public proved valuable in the development of the plan. Several comments were received that led to the rethinking of some of proposed priority mitigation actions including some from from

residents of the rural southern portion of the county that illustrated the need for assistance with maintaining drainage channels. As access to this very rural area is by one-lane or gravel roads, it is often overlooked by the county Public Works Office. During the last heavy rainfall several of the small creeks were blocked by debris, causing backup flooding of several of the properties. Maintenance and clearing of channels are activities that are now included in the flood hazard portion of the Hazard Mitigation Plan.

3.3 RISK ASSESSMENT

§201.6(c)(2) of the Rule outlines specific information that local jurisdictions must consider when completing the risk assessment portion of the plan. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. This includes detailed descriptions of all the hazards that could affect the jurisdiction along with an analysis of the jurisdiction's vulnerability to those hazards. Specific information about numbers and types of structures, potential dollar losses, and an overall description of land use trends in the jurisdiction must be included in this analysis. For multi-jurisdictional plans, any risks that affect only certain sections of the planning areas must be assessed separately in the context of the affected area.

This section includes the following six subsections as follows:

- 3.3.1 Identifying Hazards
- 3.3.2 Profiling Hazard Events
- 3.3.3 Assessing Vulnerability: Identifying Assets
- 3.3.4 Assessing Vulnerability: Estimating Potential Losses
- 3.3.5 Assessing Vulnerability: Analyzing Development Trends
- 3.3.6 Multi-jurisdictional Risk Assessment

3.3.1 IDENTIFYING HAZARDS

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type ... of all natural hazards that can affect the jurisdiction...

Explanation: The local risk assessment should identify what hazards are likely to affect the area. The plan should describe the sources used to identify hazards, noting any data limitations, and provide an explanation for eliminating any hazards from consideration. The process for identifying hazards could involve one or more of the following:

- Reviewing reports, plans, flood ordinances, and land use regulations among others;
- Talking to experts from federal, State, and local agencies and universities;
- Searching the Internet and newspapers; and
- Interviewing long-time residents.

Resources: For more information on identifying hazards, see:

- ✓ *Understanding Your Risks* (FEMA 386-2), Step 1.
- ✓ *Integrating Man-Caused Disasters into Mitigation Planning* (FEMA 386-7), Phase 2.

Examples:



Original Submittal:

Friendly County has identified several hazards to be addressed in the county’s Hazard Mitigation Plan. These hazards were identified during the development of the county’s plan based on input from Planning Committee members, and were determined to be the hazards that present the highest risk for the county.

The Friendly County Mitigation Plan addresses the following hazards:

- Hurricanes;
- Flooding;
- Coastal Erosion.

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.3.1		<ul style="list-style-type: none"> ▪ The county did not indicate how or why the hazards were identified. ▪ It is not clear if the county identified all relevant hazards.

Required Revisions:

Document the process followed to identify and/or eliminate hazards for consideration.



Revised Submittal:

Friendly County identified several hazards that are addressed in the county's Hazard Mitigation Plan. These hazards were identified through an extensive process that utilized input from Planning Committee members (comprised of representatives from FEMA Region XX, county agencies, City governments, local businesses, community groups, State Emergency Management Offices, and the State University), public input, researching past disaster declarations in the county, a review of current FIRMs, and risk assessments completed by the county Emergency Management Agency.

In addition, the county Planning Agency is developing a GIS database that will map the county's infrastructure, critical facilities, and land uses. Initial data from this study was also used to determine those hazards that present the greatest risk to the county.

The following table identifies the hazards.

Hazard	<i>How identified</i>	<i>Why identified</i>
Hurricanes	<ul style="list-style-type: none"> • Review of past disaster declarations • Input from county Department of Natural Resources • Input from residents • Risk Assessments 	<ul style="list-style-type: none"> • The county is hit almost every year by a hurricane • Hurricanes have caused damage (personal and property), flooding, and evacuation situations
Flooding	<ul style="list-style-type: none"> • Review of FIRMs • Input from county Planning Office • Risk Assessments • Public input • Review of past disaster declarations • Identification of NFIP repetitive loss properties in the county 	<ul style="list-style-type: none"> • Associated with the effects of hurricanes, which hit the county frequently • Several repetitive loss properties are located in the county • The county contains many rivers and streams, and is located along the coast
Coastal Erosion	<ul style="list-style-type: none"> • Input from county Planning Office • Input from county Department of Natural Resources • Input from Emergency State University (conducting shoreline research) • Public input 	<ul style="list-style-type: none"> • The county is undergoing development pressure along the coast • Coastline stabilization measures have been implemented in the past year • Related to hurricane frequency

3.3.2 PROFILING HAZARD EVENTS

**Requirement
§201.6(c)(2)(i):**

[The risk assessment shall include a] description of the ... location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Explanation:

When appropriate, the hazard analysis should also identify on a map the areas affected by each identified hazard. Additionally, a composite map should be provided for hazards with a recognizable geographic extent (i.e., hazards that are known to occur in particular areas of the jurisdiction, such as floods, coastal storms, wildfires, tsunamis, and landslides). For those hazards not geographically determined, plans should indicate their applicable intensity. For example, in areas where tornadoes occur, plans should indicate their maximum wind speed.

The plan should provide a discussion of past occurrences of hazard events in or near the community in terms of their severity and resulting effects.

The plans should also describe the analysis used to determine the probability of occurrence and magnitude of future hazard events. The plans should characterize each hazard and include the following information:

- The probability or likelihood that the hazard event would affect an area;
- The magnitude or severity of the hazard events;
- The geographical extent or areas in the community that would be affected; and
- The conditions, such as topography, soil characteristics, meteorological conditions, etc., in the area that make it prone to hazards.

The analysis should be detailed enough to allow identification of the areas of the jurisdiction that are most severely affected by each hazard.

Resource:

For more information on profiling hazards, see:

- ✓ *Understanding Your Risks* (FEMA 386-2), Step 2.

Examples:



Original Submittal:

Sandy County is subject to riverine and flash flooding throughout large sections of the county. There have been several flooding incidents in the county. A severe flash flood occurred in June of 2000, and the Mud River reached 100-year flood levels in 1996.

Many factors within the county affect the type and severity of flooding, including the mountains, the location of development, the amount of snow and rainfall received, and the large, wide floodplain of the Mud River.

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.3.2		<ul style="list-style-type: none"> ▪ Although the factors affecting the severity of flooding were listed, no details of their presence or location in the county were provided. ▪ The county did not provide a map identifying areas affected by flooding. ▪ A limited history of flooding was discussed.

Required Revisions:

For a satisfactory score, the plan should document the process used to determine differences in vulnerability to the hazard, differentiate the ways in which areas of the county are affected, and provide a map or other tool to delineate hazard areas.



Revised Submittal:

~~Sandy County is subject to riverine and flash flooding throughout large sections of the county. There have been several flooding incidents in the county. A severe flash flood occurred in June of 2000, and the Mud River reached 100-year flood levels in 1996.~~

~~Many factors within the county affect the type and severity of flooding, including the mountains, the location of development, the amount of snow and rainfall received, and the large, wide floodplain of the Mud River.~~

Sandy County is subject to riverine and flash flooding. **The county Planning Department has reviewed the county's Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS), and has worked with the local college to compile a profile of the flooding hazard in the county. The college provided support by completing research on flooding history in the county and entering this data into a GIS database. The GIS program shows the extent and areas affected by past flooding, and is overlain by county tax maps. This, along with**

the county's FIRMs and FIS, provides a clear picture of areas and structures most vulnerable to flooding. (See *attached Map X.X, Areas of Sandy County subject to Flood Hazards*).

Flash Flooding

The western section of the county is very mountainous with steep slopes and stream valleys. This area receives several large thunderstorms per year that cause intense rainfall for short periods of time, resulting in water flowing down from the mountains, collecting in, and sometimes overtopping the valley streams. There have also been issues with the maintenance and clearing of drainage channels in this area that have resulted in obstructions restricting the flow of water during a storm. Although this area is fairly rural, many of the residents live in the 100-year floodplain because of the steep slopes. These conditions make response and evacuation operations very difficult, adversely affecting the safety of residents.

The most recent incident occurred in June of 2000. A severe thunderstorm produced significant localized rainfall. Two small bridges were washed out and many county residents were stranded. Although no one was injured, several structures were flooded and many residents were cut off from the rest of the county. This event was estimated at a 25-year flood elevation.

Riverine Flooding

The central and eastern sections of the county are subject to riverine flooding. This is usually caused by extensive rainfall over a period of several days and can be worsened by snowmelt conditions. The Mud River located in Sandy County has flooded 12 times in the past 75 years; one was a 200-year level, four were 100-year levels, three were 50-year levels, and four were 10-year levels. The 200-year flood occurred in 1952 and resulted in significant damage to Iron City and Silvertown. The most recent flood was a 100-year level flood that occurred in 1996.

The area surrounding the Mud River is subject to flood damage because of the large amounts of rainfall and snowmelt it receives; the wide, flat floodplain; and the large numbers of structures located in the floodplain.

3.3.3 ASSESSING VULNERABILITY: IDENTIFYING ASSETS

Requirement §201.6(c)(2) (ii)(A):	<p>[The risk assessment shall include a] description of the jurisdiction’s vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of:</p> <ul style="list-style-type: none"> ▪ The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas...
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Explanation: This information list should be based on an inventory of existing and proposed structures within the community and/or an estimate of those located within identified hazard boundaries. The information should include critical facilities, such as shelters and hospitals, and infrastructure, such as roadways, water, utilities, and communication systems. The community should determine how far into the future they wish to go in considering proposed structures, including planned and approved development. It may be based on information in their comprehensive plan or land use plan. The community should determine how best to indicate structures that are vulnerable to more than one hazard.

Resource: For a discussion on identifying vulnerable structures, see:

- ✓ *Understanding Your Risks* (FEMA 386-2), Step 3.

Examples



Original Submittal:

Rocky County is susceptible to flooding and fire hazards. The Planning Department compiled a list of critical facilities in the county and determined whether they were likely to be impacted by hazards. They found several critical facilities in the county were susceptible to damage from flooding, including five storm shelters, one hospital, the local communication utility company, one wastewater treatment plant, and an old industrial site containing hazardous waste. Critical facilities that would be damaged by fire include one school and one hospital located in the rural, wooded portion of the county.

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.3.3		<ul style="list-style-type: none"> The plan did not indicate how the critical facilities were identified.

Required Revisions:

- The plan should show how the critical facilities were identified and include a map showing the location of the facilities and the hazard(s) to which they are susceptible.

The vulnerability assessment should address future planned development. Although not a requirement, it would be useful for the plan to address the presence of any special populations.



Revised Submittal:

~~Rocky County is susceptible to flooding and fire hazards. The Planning Department compiled a list of critical facilities in the county and determined whether they were likely to be impacted by hazards.~~

The Hazard Mitigation Plan for Rocky County identifies critical facilities located in the county and the hazards to which these facilities are susceptible. **A critical facility is defined as a facility in either the public or private sector that provides essential products and services to the general public, is otherwise necessary to preserve the welfare and quality of life in the county, or fulfills important public safety, emergency response, and/or disaster recovery functions.**

The critical facilities identified in the county are storm shelters; hospitals and other health care facilities; gas, electric, and communication utilities; water and wastewater treatment plants; hazardous waste sites; and schools (**see attached map XX Critical Facilities and Hazard**

Vulnerability).

The Rocky County Planning Department used GIS and other modeling tools to map the county's critical facilities and determine which are most likely to be affected by hazards. The two hazards most likely to impact the county are flooding and wildfires. **The analysis revealed the following:**

- **Flooding Hazard: A 100-year flood** would have an impact on five storm shelters, one hospital, **one elderly housing project**, the local communication utility company, one wastewater treatment plant, and an old industrial site containing hazardous waste.
- **Fire Hazard: Brush fires** could have an impact on one school and one hospital located in the rural, wooded portion of the county.

In addition to critical facilities, the county contains at risk populations that should be factored into a vulnerability assessment. These include a relatively large population of elderly residents with limited mobility.

An analysis of the county Comprehensive Plan indicates that there is a slight but constant increase in residents expected over the next 20 years. Most of the residential development is expected to occur in the already developed areas outside of the 100-year floodplain.

3.3.4 ASSESSING VULNERABILITY: ESTIMATING POTENTIAL LOSSES

Requirement §201.6(c)(2) (ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate...

Explanation: Describing vulnerability in terms of dollar losses provides the community and the State with a common framework in which to measure the effects of hazards on assets. The plan should include an estimate of losses for the identified vulnerable assets. An estimate should be provided for each hazard, and should include, when resources permit, structure, contents, and function losses to present a full picture of the total loss for each asset.

Special Considerations: While the Rule does not require it, the plan should include a composite loss map to show high potential loss areas

Resource: For a step-by-step method for estimating losses, see:
 ✓ *Understanding Your Risks* (FEMA 386-2), Step 4.

Examples:



Original Submittal:

The Rocky County Planning Department has utilized GIS modeling, field inspections, and historical data to estimate the potential dollar losses if the county were to experience flooding and wildfires, the two most likely hazards to occur in the county. The vulnerable structures and facilities were identified earlier in the planning process.

The county will have an estimated \$10 million dollars damage during a major flood, and an estimated \$3 million dollars damage in the case of a severe wildfire.

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.3.4		<ul style="list-style-type: none"> ▪ The plan did not specify which structures/facilities would be damaged, and by what hazard. ▪ The costs were not broken down for each asset likely to be damaged.

Required Revisions:

The plan must include an estimate for each structure and/or facility likely to be damaged. Although not a requirement, a map showing the assets likely to be damaged, along with estimates of damage, would be helpful.



Revised Submittal:

The Rocky County Planning Department has used GIS modeling, field inspections, and historical data to estimate the potential dollar losses if the county were to experience flooding and wildfires, the two most likely hazards to occur in the county. The vulnerable structures and facilities were identified earlier in the planning process. ~~The county will have an estimated \$10 million dollars damage during a major flood, and an estimated \$3 million dollars damage in the case of a severe wildfire.~~ **The county utilized the guidelines in the FEMA document *Understanding Your Risks: Identifying Hazards and Estimating Losses* to develop a cost estimate for damage. The estimated costs are as follows:**

Potential flood losses:

- Residential properties (including senior citizens home): \$2.5 million
- Local hospital: \$3 million
- Schools: \$2 million
- Communication utility company: \$1 million
- Waste water treatment plant: \$1.5 million

See attached map XX, Estimated Flood losses by Location and Type of Asset.

Potential Wildfire losses:

- Residential properties: \$1 million
- Hospital: \$1.5 million
- Secondary school: \$500,000

See attached map XY, Estimated Wildfire losses by Location and Type of Asset.

3.3.5 ASSESSING VULNERABILITY: ANALYZING DEVELOPMENT TRENDS

Requirement §201.6(c)(2) (ii)(c): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Explanation: The plan should provide a general overview of land uses and types of development occurring within the community. This can include existing and proposed land uses as well as development densities in the identified hazard areas and any anticipated future changes. This information provides a basis for making decisions on the type of mitigation approaches to consider, and the locations in which these approaches should be applied. This information can also be used to influence decisions regarding future development in hazard areas.

Resource: For more information on development trends, see:
 ✓ *Developing the Plan* (FEMA 386-3). **AVAILABLE FALL 02.**

Examples:



Original Submittal:

Friendly County is centrally located in the State. The county is largely rural and the main land use is farming. Jasperville City is located along the northern border of the county along the Big River.

Other land uses within the county include industrial and commercial areas, residential areas, park land and open space, and specialized land use categories (institutional, mixed-use).

The county has been dealing with some residential development pressure in the region surrounding Jasperville. Otherwise the county does not expect any changes in land use or development pressure.

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.3.5		<ul style="list-style-type: none"> Although the plan lists the land uses it does not give an indication of where the land uses are relative to hazard areas, and whether there is any anticipated change in land uses.

Required Revisions:

To receive a satisfactory score, the plan must provide more specifics on the land use types and locations and indicate if there are any planned changes, particularly in or near hazard areas.



Revised Submittal:

Friendly county is centrally located in the State and is largely rural. A majority of the county's land use is designated as farmland. The largest city, Jasperville, is located along the northern boundary of the county along the Big River. The land uses within the county consist of: industrial and commercial areas, **located in and around Jasperville**; residential areas, **located in the suburbs surrounding Jasperville**; park land and open space, **located largely in the eastern section of the county**; farmland, **which is a majority of the county**; and specialized land use designations (institutional, mixed-use) **located in the City**.

~~The county has been dealing with some residential development pressure in the region surrounding Jasperville.~~ The suburbs of Jasperville have recently undergone residential development pressure **as several large companies have opened offices in the City within the past year, attracting new residents to the area. The county Planning Office has indicated that the residential development pressure surrounding Jasperville is the largest concern with respect to future land use decisions and hazard mitigation planning. The Big River floods periodically and many of the newly developing residential areas are located in close proximity to the Big River.**

~~Otherwise the county does not expect any changes in land use or development pressure.~~ **The remainder of the county is not expected to undergo development pressure, and the Planning Office does not anticipate any changes in land use.**

3.3.6 MULTI-JURISDICTIONAL RISK ASSESSMENT

Requirement §201.6(c)(2) (iii): For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction’s risks where they vary from the risks facing the entire planning area.

Explanation: The multi-jurisdictional plan can present information for the general planning area as a whole as described in the previous paragraphs. However, where hazards and associated losses occur in only part of the planning area, this information should be attributed to the particular jurisdiction in which they occur. Further, where unique construction characteristics occur, they should be indicated on the plan so that appropriate mitigation measures are considered.

Resource: For more information on creating a detailed risk assessment, see:
 ✓ *Understanding Your Risks* (FEMA 386-2).

Examples:



Original Submittal:

Rumble County is a large county centrally located in the State. As such, there are several separate jurisdictions within the county. All of these jurisdictions contributed to the risk assessment analyses performed for the county Hazard Mitigation Plan (see preceding Section XX).

All jurisdictions within the county are subject to riverine flooding, which has been determined to be the greatest risk for the county.

REVIEWER’S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.3.6		<ul style="list-style-type: none"> The plan does not indicate if any of the contributing jurisdictions faced additional risks, or if they were affected differently by flooding.

Required Revisions:

To receive a satisfactory score, the plan must document if any particular jurisdictions are subject to additional risks or if they have unique situations that require special consideration



Revised Submittal:

Rumble County is a large county centrally located in the State. As such, there are several separate jurisdictions within the county. All of these jurisdictions contributed to the risk assessment analyses performed for the county Hazard Mitigation Plan (see preceding Section XX).

~~All jurisdictions within the county are subject to riverine flooding, which has been determined to be the greatest risk for the county.~~

Riverine flooding was identified as the most significant risk to the county and is addressed in the Mitigation Plan. However, two jurisdictions within the county have unique situations that require additional mitigation measures. Separate risk assessments were performed for each jurisdiction.

Rocky Township, located in the southern section of the county, is subject to additional flooding hazards due to its history. Rocky Township was heavily mined in the early 1900's and has several abandoned mines in the area. When heavy rainfall causes riverine flooding, Rocky Township faces the additional risk of their water supply becoming contaminated due to acid mine drainage. Therefore, the remediation of water contamination identified in the Mitigation Plan is limited to Rocky Township.

Quartz City contains a nuclear power plant that supplies power to the entire county. This power plant presents additional risks due to terrorism or malfunction of the plant's safety controls. The increased security and radiation control measures identified in the Mitigation Plan are limited to Quartz City.

3.4 MITIGATION STRATEGY

§201.6(c)(3) of the Rule outlines measures that localities must take in developing their mitigation strategies. Specifically, the Local Hazard Mitigation Plan must “include a mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.”

This entails the development of goals from which specific mitigation actions and projects will be derived. All mitigation actions must be prioritized according to a cost-benefit analysis, with a focus on how effective the actions are expected to be with respect to their cost. For multi-jurisdictional plans, each jurisdiction must show the specific actions they will undertake.

This section includes the following four subsections as follows:

- Local Hazard Mitigation Goals
- Identification and Analysis of Mitigation Measures
- Implementation of Mitigation Measures
- Multi-jurisdictional Mitigation Strategy

3.4.1 LOCAL HAZARD MITIGATION GOALS

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include: a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Explanation: The community’s hazard reduction goals, as reflected in the plan, along with their corresponding objectives, guide the development and implementation of mitigation measures. This section should describe what these goals are and how they were developed. The goals could be developed early in the planning process and refined based on the risk assessment findings, or developed entirely after the risk assessment is completed. They should also be compatible with the goals of the community as expressed in other community plan documents.

Although the Rule language does not require a description of objectives, communities are highly encouraged to include a description of the objectives developed to achieve the goals so that reviewers understand the connection between goals, objectives, and activities.

The goals and objectives should:

- Be based on the findings of the local and State risk assessments; and
- Represent a long-term vision for hazard reduction or enhancement of mitigation capabilities.

Resource: For more information on identifying local goals and objectives, see:
 ✓ *Getting Started* (FEMA 386-1). **AVAILABLE FALL 02.**
 For more information on refining local mitigation goals and objectives, see:
 ✓ *Developing the Mitigation Plan* (FEMA 386-3). **AVAILABLE FALL 02.**

Examples:

Special Considerations

Goals are general guidelines that explain what you want to achieve. They are usually long-term and represent global visions, such as “eliminate flood damage.”

Activities define strategies or implementation steps to attain the identified goals. Unlike goals, activities are specific, measurable, and have a defined completion date. Activities are more specific, such as “adopt a zoning ordinance prohibiting new development in the floodplain.”

(From *Getting Started* [FEMA 386-1], Step 4) **AVAILABLE FALL 02.**



Original Submittal:

The Rumble County Hazard Mitigation Planning Committee identified several goals that will serve as guidelines for the implementation of the county's hazard mitigation strategies.

The goals are as follows:

- Minimize future damage due to flooding of the Big River;
- Minimize damage to crops due to drought situations..

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.4.1		<ul style="list-style-type: none"> ▪ There is no explanation for how the goals were developed. ▪ The plan does not mention objectives that will be used to achieve the goals.

Required Revisions:

To receive a satisfactory score, the plan should describe how the goals were developed. Additionally, it would be helpful to include the objectives that will be used to achieve the goals.



Revised Submittal:

The Rumble County Hazard Mitigation Planning Committee ~~identified several goals that will serve as guidelines for the implementation of the county's hazard mitigation strategies.~~ **held a 2-day charette to review and analyze the risk assessment studies that were performed for the county. The goals listed were determined to be those that would have the greatest benefit in hazard reduction to the county. The goals, objectives, and actions for each are as follows:**

~~The goals are as follows:~~

- **Goal 1: Reduce flood damage in the county.**
- **Activity 1.1: Minimize future damage due to flooding of the Big River.**
 - **Task 1.1.1.1: Place a restrictive clause in the county Ordinance that will prohibit development in the Big River floodplain.**
 - **Task 1.1.1.2: Work with existing floodplain residents to elevate or floodproof their structures, including obtaining funding assistance and technical guidance.**
 - **Task 1.1.1.3: Preserve the floodplain along the Big River as open**

space for recreation.

- **Goal 2: Reduce economic impact of droughts.**
- **Activity 2.1: Minimize damage to local crops due to drought situations.**
- **Task 2.2.1.1: Develop water-rationing measures that will be implemented during a drought situation.**
- **Task 2.2.1.2: Educate residents on the benefits of conserving water at all times, not just during a drought.**
- **Task 2.2.1.3: Work with local farmers to investigate the use of more drought-resistant crops.**

3.4.2 IDENTIFICATION AND ANALYSIS OF MITIGATION MEASURES

Requirement §201.6(c)(3) (ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Explanation: The local jurisdiction should list potential loss reduction activities it has identified in its planning process and describe its approach to evaluating these activities to select those that achieve the community’s goals and objectives. Particular attention should be given to those mitigation activities that address existing and new buildings and infrastructure.

Not all of the mitigation measures identified may ultimately be included in the community’s plan due to prohibitive costs, scale, low benefit/cost analysis ratios, or other concerns. The process by which the community decides on particular mitigation measures must be described. The information will also be valuable as part of the alternative analysis for the National Environmental Policy Act (NEPA) review required if projects are federally funded.

Resource: For more details on the mitigation action evaluation process, see:

- ✓ See *Developing the Mitigation Plan* (FEMA 386-3), Step 2. **AVAILABLE FALL 02.**

Examples:



Original Submittal:

The City of Rolling Hills has identified several hazard mitigation projects that would benefit the City. The Planning Group has identified the following actions for the City of Rolling Hills:

- Acquisition and relocation of flood-prone structures;
- Removal of repetitive loss properties and preservation of the land as open space along the Big River;
- Develop new practices for drainage conveyance, slope excavation, and grading;
- Build tornado shelters; and
- Recommend better anchoring methods for manufactured housing.
- Implementation of these projects will help Rolling Hills be less prone to

damage from natural hazards.

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.4.2		<ul style="list-style-type: none"> ▪ The plan did not indicate how or why the actions were selected. ▪ It is also unclear if all of the recommendations will be implemented, or only those that are determined to be the most beneficial after a cost-benefit analysis for each action has been completed.

Required Revisions:

To receive a satisfactory score, the plan should describe how the actions were identified, and how the community will decide which measures to implement.

Revised Submittal:

The City of Rolling Hills has identified several hazard mitigation projects that would benefit the City and will be formalized in the City Hazard Mitigation Plan. These were identified in the Planning Group Meetings, which included input from local government agencies, county government, the local college, and residents. The hazard prone areas and the mitigation actions suggested for each are as follows:

- **Eastern Neighborhood:** Located along the Big River and prone to overbank flooding. Recommend acquisition and relocation of flood-prone structures and repetitive loss properties. Focus on preservation and expansion of the created open space along the river.
- **Western Neighborhood:** Located in the foothills and prone to landslides. City Natural Resource Agency will conduct research to determine best management practices regarding drainage conveyance, slope excavation, and grading practices that reduce the risk of landslides. Work to incorporate these findings into the City development ordinances.
- **Southern Neighborhood:** Prone to tornado damage. Form task force to study shelter design and reinforcement and anchoring of manufactured homes. Disseminate the information to residents and provide funding to residents to assist them in complying with the recommendations.



3.4.3 IMPLEMENTATION OF MITIGATION MEASURES

Requirement:
§201.6(c)(3) (iii):

[The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Explanation:

After outlining the mitigation measures to be included in the strategy, the local government should describe the method used to prioritize the order in which they intend to implement them.

Prioritization shall include an emphasis on cost-benefit analysis with a focus on how effective the actions are expected to be with respect to their cost.

The action plan should also identify those policies, programs, or resources that can be used to implement the strategy. This section should include the implementation timeline; the funding sources, when possible; and the agency or personnel responsible for carrying out the actions.

Resource:

For a detailed description of the development of the action plan, see:

- ✓ *Developing the Mitigation Plan* (FEMA 386-3), Step 3; and
- ✓ *Using Benefit-Cost Analysis in Mitigation Planning* (FEMA 386-5). **AVAILABLE FALL 02.**

Examples:



Original Submittal:

The City of Sandytown has identified several hazard mitigation measures to be included in the Mitigation Plan. These projects are as follows:

Hazard	Project	Priority
Flooding	<ul style="list-style-type: none"> ▪ Acquisition and relocation of flood-prone structures and repetitive loss properties 	High
	<ul style="list-style-type: none"> ▪ Preservation and expansion of open space along the river 	Medium

Hazard	Project	Priority
Landslides	<ul style="list-style-type: none"> Determine best management practices (BMP) regarding slope excavation, drainage conveyance, and grading practices that reduce the risk of landslides 	High
	<ul style="list-style-type: none"> Incorporate BMP findings into City ordinance 	High
Tornado	<ul style="list-style-type: none"> Task force to study shelter design, and reinforcement and anchoring of manufactured homes. Disseminate the information to residents. 	Low
	<ul style="list-style-type: none"> Provide funding to residents to help them comply with the above recommendations. 	Low

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.4.3		<ul style="list-style-type: none"> The plan does not describe how the projects were prioritized, who will be responsible for implementing them, and it does not identify funding sources.

Required Revisions:

The plan must describe how the mitigation projects were prioritized. The agencies responsible for implementation of the projects should be identified, along with the respective funding sources.

Revised Submittal:

The City of Sandytown has identified several hazard mitigation projects to be included in the Hazard Mitigation Plan. **These projects, along with the responsible agency, the funding source, and their priority are listed in the following table.**

The Planning Group worked with two professors from the Economic and Planning Schools of the local college to evaluate potential projects. The professors and a handful of students completed cost-benefit analyses for each project, providing a cost-benefit ratio, expected present value, and internal rate of return. Each project was judged against these criteria and ranked according to their greatest cost-benefit ratio, their expected present value, and their internal rate of return. When necessary, the Planning Group also



looked at past occurrences and historical trends to aid in assigning priority. The summary of the results is included in the plan as Appendix X.

Hazard	Project	Priority
Flooding	<ul style="list-style-type: none"> ▪ Acquisition and relocation of flood-prone structures and repetitive loss properties 	High
	<ul style="list-style-type: none"> ▪ Preservation and expansion of open space along the river 	Medium
Landslides	<ul style="list-style-type: none"> ▪ Determine best management practices (BMP) regarding slope excavation, drainage conveyance, and grading practices that reduce the risk of landslides 	High
	<ul style="list-style-type: none"> ▪ Incorporate BMP findings into City ordinance 	High
Tornado	<ul style="list-style-type: none"> ▪ Task force to study shelter design, and reinforcement and anchoring of manufactured homes. Disseminate the information to residents. 	Low
	<ul style="list-style-type: none"> ▪ Provide funding to residents to help them comply with the above recommendations. 	Low

3.4.4 MULTI-JURISDICTIONAL MITIGATION STRATEGY

Requirement §201.6(c)(3) (iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Explanation: The multi-jurisdictional plan should contain a section that links the proposed mitigation actions to the applicable jurisdictions. Any jurisdiction within the planning area requesting approval or credit for the Mitigation Plan must be able to point to specific actions to be pursued.

Resource: For more information on the development of the action plan, see:
 ✓ *Developing the Mitigation Plan* (386-3), Step 4. **AVAILABLE FALL 02.**

Examples:



Original Submittal:

Rumble County’s Mitigation Plan encompasses several jurisdictions. The following strategies for hazard mitigation within the county were identified to reduce overall damage in the county:

- Buyouts for the NFIP Repetitive Loss Properties located within its boundaries;
- Add a more restrictive clause to the Flood Ordinance to prohibit structures from being built in the floodway; and
- Add an additional building inspector to help identify unpermitted development in the floodplain.

REVIEWER’S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.4.4		<ul style="list-style-type: none"> ▪ The plan does not identify which actions apply to each jurisdiction.

Required Revisions:

For a satisfactory score, the plan should list specific actions by jurisdiction.



Revised Submittal:

Rumble County’s Mitigation Plan encompasses several jurisdictions. Strategies for hazard mitigation within the county were identified to reduce overall damage in the county. **Although these strategies are aimed at reducing overall damage in the county, each jurisdiction will be responsible for pursuing the actions that are relevant to that jurisdiction. The jurisdictions, along with the specific actions they will pursue, are listed as follows:**

- ~~Buyouts for the NFIP Repetitive Loss Properties located within its boundaries.~~ **Sandy Township: This Township will pursue buyouts for the NFIP Repetitive Loss Properties located within its boundaries.**
- ~~Add a more restrictive clause to the Flood Ordinance to prohibit structures from being built in the floodway.~~ **Rolling Hills: This City will add a more restrictive clause to its ordinance to prohibit structures from being built in the floodway.**
- ~~Add an additional building inspector to help identify unpermitted development in the floodplain.~~ **Soggy Bottom: This Town will add an additional building inspector to its staff to help identify unpermitted development in the floodplain.**

4.5. PLAN MAINTENANCE PROCEDURES

§201.6(c)(4) requires a formal plan maintenance process to take place to ensure that the Mitigation Plan remains an active and pertinent document. The plan maintenance process includes a schedule for monitoring and evaluating the plan at least every five years, and continued public participation throughout the plan maintenance process. This section should also include an explanation of how local governments intend to incorporate their mitigation strategies into any existing planning mechanisms they have, such as comprehensive or capital improvement plans, or zoning and building codes.

This section includes the following three subsections as follows:

- 3.5.1 Monitoring, Evaluating, and Updating the Plan
- 3.5.2 Implementation Through Existing Programs
- 3.5.3 Continued Public Involvement

4.5.1. MONITORING, EVALUATING, AND UPDATING THE PLAN

**Requirement
§201.6(c)(4)(i):**

[The plan maintenance process shall include a section describing the] method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Explanation:

The local jurisdiction should describe the system it has established to monitor the plan (this system may include periodic reports by agencies involved in implementing projects or activities; site visits, phone calls, and meetings conducted by the person responsible for overseeing the plan; and the preparation of an annual report that captures the highlights of the previously mentioned activities).

The local jurisdiction plan should also include a description of how, when, and by whom the plan will be evaluated, and should include the criteria used to evaluate the plan. The evaluation should assess, among other things, whether:

- The goals and objectives address current and expected conditions.
- The nature or magnitude of risks has changed.
- The current resources are appropriate for implementing the plan.
- There are implementation problems, such as technical, political, legal or coordination issues with other agencies.
- The outcomes have occurred as expected.
- The agencies and other partners participated as proposed.

Ideally, the Plan should be evaluated on an annual basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The plan should describe how, when, and under what conditions the plan will be updated and what agencies and interested parties will participate in the update. If plans are not updated annually, the plan should describe the schedule chosen by the community and provide an explanation for that schedule.

Resource:

For guidance on the plan maintenance process, see:

- ✓ *Bringing the Plan to Life* (FEMA 386-4). **AVAILABLE FALL 02.**

Examples:



Original Submittal:

Rocky County has developed a method to ensure that regular review and update of the Hazard Mitigation Plan occurs. The county Planning Department will be responsible for holding annual meetings with local agencies and other concerned parties to evaluate the Mitigation Plan. The Planning Department will then update the plan as necessary. If no changes are required, the county will give the State Hazard Mitigation Officer justification as to why no changes were deemed necessary.

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.5.1		<ul style="list-style-type: none"> The plan does not include a specific schedule or timeline for the review and evaluation of the plan. The local agencies and concerned parties to be included in the evaluation are not identified. This section does not describe how the plan will be evaluated.

Required Revisions:

The plan should include a firm schedule and timeline for the evaluation of the plan. The local agencies and other concerned parties who will participate in the evaluation should be identified. This section should include a description of how the plan will be evaluated.



Revised Submittal:

~~The county Planning Department will be responsible for holding annual meetings with local agencies and other concerned parties to evaluate the Mitigation Plan. The Planning Department will then update the plan as necessary. If no changes are required, the county will give the State Hazard Mitigation Officer justification as to why no changes were deemed necessary.~~

Rocky County has developed a method to ensure that regular review and update of the Hazard Mitigation Plan occurs. The county has formed a Hazard Mitigation Plan Evaluation Committee that consists of members from local agencies and other concerned parties, including elected officials, the county Department of Natural Resources, the county Office of Economic Development, the county Office of Emergency Services, the county DOT, the non-profit Mud River Watershed Society, and representatives from the State University Geography Department. The county Planning Department is responsible for contacting committee members and organizing the annual meeting. The meeting will be held in March of each year, and

committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the plan.

The committee will review each goal and objective to determine their relevance to changing situations in the county, as well as changes in State or federal policy, and to ensure that they are addressing current and expected conditions. The committee will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects and will include which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding, and which strategies should be revised.

The Planning Department will then have three months to update and make changes to the plan before submitting it to the Committee members and the State Hazard Mitigation Officer. If no changes are necessary, the State Hazard Mitigation Officer will be given a justification for this determination.

4.5.2. IMPLEMENTATION THROUGH EXISTING PROGRAMS

Requirement §201.6(c)(4) (ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate...

Explanation: Jurisdictions should indicate how mitigation recommendations will be integrated into job descriptions, comprehensive plans, capital improvement plans, zoning and building codes, site reviews, permitting, and other planning tools, where such tools are the appropriate vehicles for implementation.

Communities that do not have a comprehensive plan, or other similar planning mechanisms, should explain how the mitigation recommendations would be implemented. Further, for certain mitigation actions that may use other means of implementation, these other tools should be described.

Resource: For more information on integrating hazard mitigation activities in other initiatives, see:

✓ *Getting Started* (FEMA 386-1). **AVAILABLE FALL 02.**

Examples:



Original Submittal:

Rocky County currently utilizes comprehensive land use planning, capital improvements planning, and building codes. After the county officially adopts the Hazard Mitigation Plan, these existing mechanisms will have hazard mitigation strategies integrated into them. This will be done so that planning for hazard mitigation will become an essential part of all county decisions and policies.

REVIEWER'S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.5.2		<ul style="list-style-type: none"> The plan does not state how planning for hazard mitigation will be incorporated into existing mechanisms, only that it will be done

Required Revisions:

The plan must indicate how Mitigation Plan requirements will be incorporated into existing planning mechanisms.



Revised Submittal:

~~Rocky County currently utilizes comprehensive land use planning, capital improvements planning, and building codes. After the county officially adopts the Hazard Mitigation Plan, these existing mechanisms will have hazard mitigation strategies integrated into them. This will be done so that planning for hazard mitigation will become an essential part of all county decisions and policies.~~

Rocky County currently utilizes comprehensive land use planning, capital improvements planning, and building codes to guide and control development in the county. After the county officially adopts the Hazard Mitigation Plan, these existing mechanisms will have hazard mitigation strategies integrated into them.

After adoption of the Mitigation Plan, the county will require that local municipalities address natural hazards in their comprehensive plans and land use regulations. Specifically, one of the goals in the Mitigation Plan directs county and local governments to protect life and property from natural disasters and hazards. The county Planning Department will conduct periodic reviews of the county's comprehensive plans and land use policies, analyze any plan amendments, and provide technical assistance to other local municipalities in implementing these requirements.

The county Building Department is responsible for administering the building codes in local municipalities. After the adoption of the Mitigation Plan, they will work with the State Building Code Office to make sure that the county adopts, and is enforcing, the minimum standards established in the new State Building Code. This is to ensure that life/safety criteria are met for new construction.

The capital improvement planning that occurs in the future will also contribute to the goals in the Hazard Mitigation Plan. The county Natural Resources Department will work with capital improvement planners to secure high-hazard areas for low risk uses.

Within six months of the formal adoption of the Mitigation Plan, the policies listed above will be incorporated into the process of existing planning mechanisms.

4.5.3. CONTINUED PUBLIC INVOLVEMENT

Requirement §201.6(c)(4) (iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

Explanation: The plan should describe what opportunities the broader public (i.e., stakeholders who are not part of the planning team) would have during the plan’s periodic review to comment on the progress made to date and the proposed plan revisions. Plans should describe the mechanisms for keeping the public involved (e.g., holding strategic meetings, posting the proposed changes to the plan on the web, etc.)

Resource: For more information on keeping the public involved, see:
 ✓ *Getting Started* (FEMA 386-1); and
 ✓ *Bringing the Plan to Life* (FEMA 386-4). **AVAILABLE FALL 02.**

Examples:



Original Submittal:

Rocky County is dedicated to involving the public directly in the continual reshaping and updating of the Hazard Mitigation Plan. The Hazard Mitigation Plan Evaluation Committee members are responsible for the annual review and update of the plan. Although they represent the public to some extent, the public will be able to directly comment on and provide feedback about the plan. Several active public outreach projects occurring in the county will enable the public to be involved in all aspects of the planning process.

REVIEWER’S COMMENTS

PLAN CRITERIA SUBSECTION	CORRESPONDING PLAN SECTION	IMPROVEMENTS NEEDED
3.5.3		<ul style="list-style-type: none"> The plan does not provide details about the public outreach projects.

Required Revisions:

The plan should describe the public outreach projects the county is undertaking, and the mechanisms for keeping the public involved.



Revised Submittal:

Rocky County is dedicated to involving the public directly in the continual

reshaping and updating of the Hazard Mitigation Plan. The Hazard Mitigation Plan Evaluation Committee members are responsible for the annual review and update of the plan. Although they represent the public to some extent, the public will be able to directly comment on and provide feedback about the plan.

~~Several active public outreach projects occurring in the county will enable the public to be involved in all aspects of the planning process.~~

Copies of the plan will be catalogued and kept on hand at all of the public libraries in the county. The existence and location of these copies will be publicized in the monthly newsletter sent out by the county Chamber of Commerce. Contained in the plan is the address and phone number of county Planning Department Staff Member(s) responsible for keeping track of public comments on the plan.

In addition, copies of the plan and any proposed changes will be posted on the county Government website. This site will also contain an email address and phone number to which people can direct their comments or concerns. A link to this site will also be provided on the local Sandy State College Department of Geography and Department of Urban Planning web pages.

A public meeting will also be held after each annual Mitigation Plan Evaluation Committee meeting. This meeting will provide the public a forum for which they can express its concerns, opinions, or ideas about the plan. The county Planning Department will publicize and host this meeting.

APPENDIX F

APPENDIX F: EXAMPLE PLAN

To be developed.