

Hazard Mitigation Planning in Michigan



**Michigan State Police
Emergency Management and
Homeland Security Division**

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Outline of this Module:

- The Meaning of Hazard Mitigation Planning
- Planning Process
 - Preparation
 - Hazard Analysis
 - List of Hazard Mitigation Actions
 - Plan Completion and Periodic Update
- Funds for Hazard Mitigation Projects
- Michigan Examples



Hazard Mitigation Planning

- The BASICS:
- What is a hazard?
 - Something that could cause harm to people, property, or the environment.
 - From an emergency management perspective, it can also be defined as something that could cause a disaster or a state of emergency within an area.
 - It may exclude routine events that have limited community-level impact.



Hazard Mitigation Planning

- The BASICS
- What is hazard mitigation?
- Mitigate: To make less severe or intense; to reduce the impact of something
- Hazard mitigation is any action taken in advance to reduce or eliminate the harm caused by hazards.



Hazard Mitigation Planning

- The BASICS
- What is hazard mitigation planning?
- To propose specific actions, in writing, that can reduce or prevent harm from hazards.
- A hazard mitigation plan is a written explanation of hazard mitigation actions that a community might achieve.



Hazard Mitigation Planning

- Hazard Mitigation is one of the **phases** of emergency management:
 - PREVENTION / MITIGATION
 - PREPAREDNESS
 - DISASTER OR EMERGENCY EVENT
 - RESPONSE
 - RECOVERY (short-term, long-term)



Hazard Mitigation Planning

- Each “Phase” has its own distinct planning processes
 - PREVENTION / MITIGATION
 - PREPAREDNESS
 - DISASTER OR EMERGENCY EVENT
 - RESPONSE
 - RECOVERY (short-term, long-term)



Hazard Mitigation Planning

- PLANS come from
 - A research process
 - » To obtain information and
 - A political process
 - » For community input



Hazard Mitigation Planning

- PLANS are grounded in
 - Good information
and
 - Community involvement



Hazard Mitigation Planning

- The Research process (hazard analysis)
 - Identifies what needs to be protected
 - Persons
 - Property and Infrastructure
 - Other important features
 - Identifies the hazards that may affect the area
 - Identifies the extent of risk to vulnerable areas from these identified hazards



Hazard Mitigation Planning

- The Political process (mitigation plan)
 - Identifies goals and objectives for local agencies and partners to consider
 - Goals are general statements, easy to agree to
 - Objectives are more specific, harder to achieve
 - Lists alternatives being considered as specific solutions
 - Evaluates alternatives using local criteria
 - FEMA requires consideration of costs vs. benefits
 - Proposes specific actions to reach objectives
 - Actions have specific details: who, where, how...



Hazard Mitigation Planning

- Coordinating with master planning process
 - Most communities have master plans (aka comprehensive plans, land use plans, etc.)
 - Hazard mitigation can be included as a component of community master plans.
 - This provides an effective way to implement hazard mitigation actions.
 - The work provided by community planners or planning consultants is of great benefit.



FEMA Plan Review Standards

- Local hazard mitigation plans can make a community eligible for hazard mitigation project grant money from FEMA.
 - Hazard Mitigation Assistance (HMA) program
- But only if the community's plan passes a FEMA review and is officially adopted by that community.



Plan review requirements: 4 general sections

- 1. Planning preliminaries
 - Preparation, Participation, Process
 - » About 25% of the work
- 2. Hazard Analysis Section
 - » About 40% of the work
- 3. Action Plan Section
 - “Action plan” means that there is a list of specific actions that a community intends to implement
 - » About 30% of the work
- 4. Other... (About 5% of the work)



Planning Preliminaries

- **STEP ONE: Prepare the community**
 - Inform key agencies, officials, and stakeholders about the need for a hazard mitigation plan (and the community's vulnerability)
 - Assemble a team of subject matter experts, representatives of responsible agencies, etc. to review and provide input on the draft plan as it is developed
 - For example, fire chiefs, drain commissioner, etc.



Hazard Mitigation Planning

- Prepare the community
 - Hazard mitigation plans are often completed at a county level, and therefore these plans represent many townships, cities, villages...
 - Such plans are called “multi-jurisdictional” plans.
 - Multi-jurisdictional plans address the risks and concerns of many communities, but each community needs to participate in the plan, in order to receive FEMA’s approval.



Hazard Mitigation Planning

- Being an active participant in a multi-jurisdictional plan involves three things:
 - 1 – Being involved in the review or revision of the draft plan materials that pertain to that community.
 - Meetings, phone calls, e-mails, or survey responses
 - 2 – The plan must include some hazard mitigation actions that the participating community has agreed to.
 - 3 – The completed plan must be officially adopted by the community.



Hazard Mitigation Planning

- Prepare the community
 - Community members will want to know why a hazard mitigation plan will be beneficial.
 - The following reasons may be useful to help explain the reasons why hazard mitigation planning is useful.



Hazard Mitigation Planning

- REASONS for a local hazard mitigation plan:
 - Preventing loss of life
 - Protecting property
 - Maintaining or improving community infrastructure
 - Preserving and protecting the area's
 - Economy and property values
 - Environment
 - Maintaining or improving an area's
 - Quality of life
 - Reputation



Hazard Mitigation Planning

- REASONS for a local hazard mitigation plan:
 - To provide information about hazards, risks, and emergency management efforts, to citizens, officials, businesses, community organizations, etc.
 - Political and legal concerns
 - Reducing liability
 - Local control issues during/after a disaster
 - Funds for project implementation



Hazard Mitigation Planning

- Written guidance documents that describe hazard mitigation planning activities:
 - FEMA guidance documents
 - “Local Mitigation Plan Review Guide” (Oct. 2011)
<http://www.fema.gov/media-library/assets/documents/23194?id=4859>
 - “Local Mitigation Planning Handbook” (Mar. 2013)
<http://www.fema.gov/media-library/assets/documents/31598?id=7209>
 - FEMA’s “How To” guides (FEMA 386-1, 386-2, etc.)
<http://www.fema.gov/hazard-mitigation-planning-resources>



Hazard Mitigation Planning

- Written guidance documents that provide hazard mitigation planning information:
 - State of Michigan document:
 - “Local Hazard Mitigation Planning Workbook” (EMHSD Pub. 207) Currently being updated
 - “Michigan Hazard Analysis” (EMHSD Pub. 103) July 2012 edition
 - “Michigan Hazard Mitigation Plan” (EMHSD Pub. 106) March 2014 edition just published

http://www.michigan.gov/msp/0,4643,7-123-60152_62790-14743--,00.html



Hazard Mitigation Planning

- The Community Profile
 - A community profile describes your community and its important features.
 - It helps you to summarize the things that need to be protected from hazards.
 - Ideally, most of the information for the community profile would be readily obtained from existing sources.
 - A community profile section is recommended, but not required in a plan.



Hazard Mitigation Planning

- A community profile may describe (for example):
 - Population characteristics (U.S. Census, and the American Community Survey)
 - Housing & Buildings - census, zoning, historic sites
 - Transportation and other infrastructure
 - Environmental features – wetlands, preserves, etc.
 - Political jurisdictions – units of government
 - Critical facilities (public safety, government offices, schools, critical infrastructure, etc.)
 - Special events (festivals, county fairs, etc.)



Hazard Mitigation Planning

- **Section Two of the Plan Review Form:
The Hazard Analysis**
 - Considered to be the core of the plan
 - 1. Identify hazards that could occur
 - 3 types: natural, technological, human-related
 - 2. Determine the extent of risk from each hazard
 - Each hazard's probability and impact
 - 3. Identify the community's vulnerabilities



Conducting a Hazard Analysis

- The general approach of a hazard analysis is to determine each possible hazard's frequency, severity, potential impacts, and locations...
- Then to compare these locations and impacts with the important features of your community (from the community profile)
- Where hazards interact with the community, identify any vulnerabilities.



Conducting a Hazard Analysis

- **KNOWN HAZARDS IN MICHIGAN:**
 - Natural Hazards (required by FEMA)
 - Technological Hazards (mostly optional)
 - Human-Related Hazards (mostly optional)



Conducting a Hazard Analysis

- Natural Hazards
 - Severe Weather
 - Thunderstorm: lightning, winds, hail
 - Winter Weather: ice and sleet storms, snowstorms
 - Tornadoes and Severe Winds
 - Extreme Temperatures (hot or cold)
 - Hydrological hazards: floods and droughts
 - Ecological hazards: wildfires, invasive species
 - Geological hazards: earthquakes, subsidence, geomagnetic storms, meteorites

Any significant natural hazards must be included in the plan



Conducting a Hazard Analysis

- Technological Hazards:
 - Industrial hazards
 - Structural fires, scrap tire fires
 - Hazardous material incidents
 - Industrial accidents, Nuclear plant emergencies,
 - Transportation Haz Mat spills, pipeline or well incidents
 - Infrastructure Problems
 - Transportation systems, electrical systems, sewerage systems, water systems, energy shortages, communication systems, bridges, dams, etc.

Dam failure is required (FEMA sees it as part of the flood hazard, and therefore as a natural hazard)



Conducting a Hazard Analysis

- Human-Related Hazards:
 - Catastrophic Incidents (National Emergencies)
 - Can occur outside of Michigan but still affect the state
 - Terrorism and similar criminal activities
 - Civil Disturbances (riots, violent protests, etc.)
 - Public Health Emergencies (pandemic disease, food system contamination/breakdowns, etc.)
 - Nuclear Attack (plus other warfare or WMD)
 - Cyber-attacks (vs. communications, financial systems, government, service providers, security)

Required: Pandemic disease (FEMA: a natural hazard)



Conducting a Hazard Analysis

- The best starting points for information about previous events:
 - Michigan Hazard Mitigation Plan
 - Found on Michigan State Police EMHSD publications page
 - National Climatic Data Center (NCDC) Storm Events database web page
 - Web Search: “NCDC Storm Events”
 - <http://www.ncdc.noaa.gov/stormevents/>



Conducting a Hazard Analysis

- Based on the history of past events:
 - How frequently does the hazard occur?
 - How severe can the hazard get?
 - What are the hazard's impacts?
 - What community vulnerabilities exist?
 - Do the risks/vulnerabilities vary by location?
 - Are some areas at greater risk than others?



Conducting a Hazard Analysis

- Flood example – FEMA maps available online
 - “100-year floodplain” (estimated 1% chance/year)
 - “500-year floodplain” (estimated 0.2% chance/yr)

A screenshot of a web browser displaying the FEMA MSC Viewer interface. The browser's address bar shows the URL: http://map1.msc.fema.gov/jidms/IntraView.cgi?ROT=0&O_X=7412&O_Y=6035&O_ZM=0.040000&O_SX=593&O_SY=336&O_D. The page header includes the FEMA logo, the text "FEMA MSC Viewer", and an "Info" icon. A scale bar shows "Scale: 6 % GO". The main content area displays a map of the Stryder Air National Guard Base, showing various flood zones (ZONE A, ZONE B, ZONE C, ZONE D) and geographical features like LAKE ST CLAIR and HULLSBAY BAY. The map is overlaid with a grid. On the left side of the map, there is a vertical toolbar with several icons: a question mark for "Help", a red cross for "Zoom Win", a yellow hand for "Pan", a red cross with a magnifying glass for "Zoom In", a red cross with a magnifying glass and a minus sign for "Zoom Out", a "1:1" icon for "Zoom In", a "MAX" icon for "Zoom Out", and a button labeled "Make a FIRMette". At the bottom of the browser window, the text "Item ID: 2601230005C.DI Name/Class: FLOOD INSURANCE RATE MAP (FIRM) Descrip" is visible.



Conducting a Hazard Analysis

- USGS maps – topographic and other features
- Compare community profile and flood maps:

Address <http://www.topozone.com/map.asp?z=17&n=4717772&e=351528&s=100&size=m&datum=nad83&layer=DRG25> Go Links >>

1:24K/25K Series
 1:100K Series
 1:250K Series

Map Size
 Small
 Medium
 Large

View Scale
1 : 100,000
Update Map

Coordinate Format
UTM

Coordinate Datum
WGS84/NAD83
 Show target

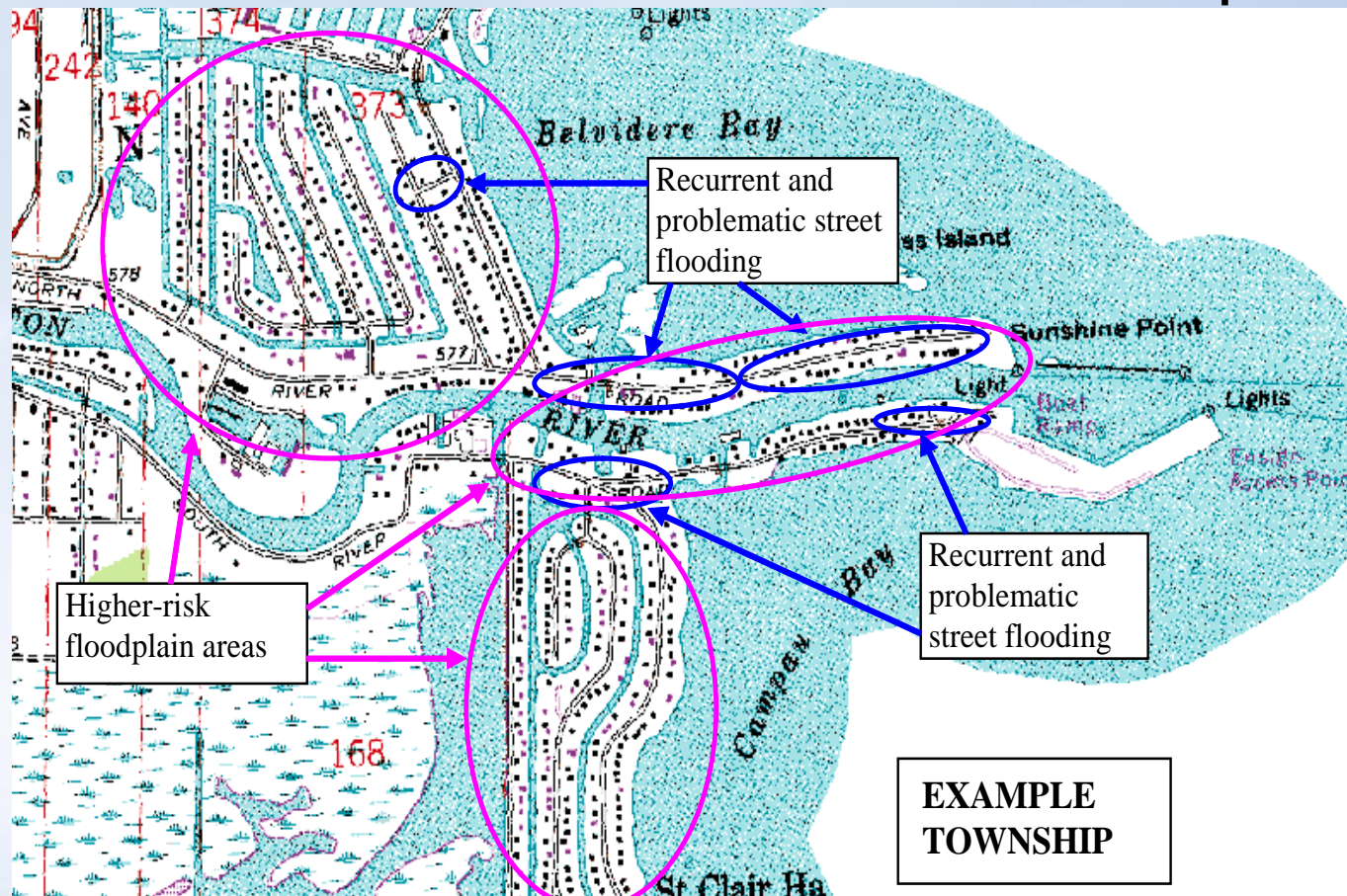
[Email this map](#)
[Bookmark this](#)

A topographic map showing the Harris Canyon area. The map features a winding river, several bays (Belvidere Bay, Campus Bay), and various land parcels. Key locations include Selridge, Air Force Base, Harris Canyon, and St. Clair Haven. The map includes contour lines, roads, and other geographical features. The map is displayed in a web browser window with a control panel on the left side.



Conducting a Hazard Analysis

- Comparing the flood and community information lets us describe the flood impacts:





Conducting a Hazard Analysis

- Hazard risks and hazard mitigation actions could be compared and prioritized according to their expected annual costs (and the potential for reducing those costs through hazard mitigation).
 - Example: expected annual costs, reducible to:

– Flooding	\$40,000	→	\$15,000
– Wildfires	\$14,000	→	\$11,000
– Winter weather	\$10,000	→	\$ 9,500



The Community's Action Plan

- Action Plan section
 - (list of hazard mitigation actions)
- A list of actions or strategies that your community and its partners intend to implement (or would like to achieve).
- Actions should
 - build upon existing capabilities, or
 - propose specific hazard mitigation projects for FEMA funding



Hazard Mitigation Planning

- Hazard mitigation actions may be coordinated with the needs or desires of other agencies, to achieve shared goals.
 - Example: Water backs up behind an old bridge, causing nearby areas to flood.
 - Hazard mitigation goal: reduce flooding
 - Transportation goal: upgrade the old bridge
 - Shared solution: funds from FEMA to reduce floods are matched with transportation funds for the bridge upgrade. Mutual benefits result.

Plan Update Cycle



- Under federal guidelines, local hazard mitigation plans must be updated every 5 years...

...for communities to maintain their eligibility to apply for or directly benefit from hazard mitigation project funds.



Plan Update Cycle

- **EXAMPLE:**
- Action Item in hazard mitigation plan:
 - Expand undersized culvert by Elmer Fludd Road, within the Village of Poseidon

Q: What grant programs exist for this?

A: Hazard Mitigation Assistance grants:

- Hazard Mitigation Grant Program (post-disaster)
- Pre-Disaster Mitigation Program (annual)
- Flood Mitigation Assistance Program (annual)



Finally...

- When the plan seems to be complete, it should be sent to the Michigan State Police EMHSD.
- It will receive an advisory review from EMHSD staff, and an official FEMA review may then follow.
- The plan should only be officially adopted by communities after a favorable FEMA review.



Finally...

- FEMA approval lasts for 5 years
- After 5 years, the plan must be formally updated, and sent to FEMA again, for review.



Finally...

- For questions or additional information:
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