



LAMAR COUNTY HAZARD MITIGATION PLAN

2014 PLAN UPDATE

Hazard Mitigation Plan Update

1. October 8, 2013 Reviewed Original Hazard Mitigation Plan with Committee Members
2. October 31, 2013 Work Session to include NFIP program and FEMA Flood Map Process
3. November 21, 2013 Work session to focus on goals and objectives for Mitigation Plan
4. December 18, 2013 Reviewed the updates for the draft of the Mitigation Plan
5. November 2014 Old EMA Director submitted hard copy to Alabama EMA
6. November 16, 2015 New EMA Director started
7. November 18, 2015 Notified the Hazard Mitigation had to be retyped
8. December 11, 2015 Submitted Electronic copy of Hazard Mitigation Plan
9. December 14, 2015 Received feedback information needed to be updated
10. January 28, 2016 Meet with Lamar County Firefighters and Rescue Squads Association
11. January 29, 2016 Sent Draft to Alabama EMA
12. June 7, 2016 Final review of Hazard Mitigation Plan, Final revisions and comments, and resolution adoption procedures. Final plan will be sent in on June 13, 2016 along with Lamar County Commission's adopted resolution.

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Lamar County, Alabama Hazard Mitigation Plan

Introduction

The Lamar County Hazard Mitigation Plan is a multi-jurisdiction, multi-hazard mitigation plan. This plan fulfills the requirements set forth by the Federal Disaster Mitigation Act of 2000 (DMA 2000). It meets all eligibility requirements set forth by the Federal Emergency Management Agency (FEMA) for grant assistance. To date, assistance is available from the following grant programs: the Hazard Mitigation Grant (HMGP), Flood Mitigation Assistance Program (FMA), Pre-Disaster Mitigation Program (PDM), Repetitive Flood Claim Grant Program (RFC), and Severe Repetitive Loss Program (SRL) and incorporated these elements into the FMA Program. The FMA Program now allows for up to 100% federal cost share for severe repetitive loss properties; 90% federal cost share for repetitive loss properties; and 75% federal cost share for repetitive loss properties.

This plan covers the entire County including all incorporated areas, the Towns of Beaverton, Detroit, Kennedy, Millport, and the Cities of Sulligent and Vernon. Other local governments that elected to participate in and adopt the plan are: the Lamar County School Board, Lamar County Fire.

On October 30, 2000, the United States Congress passed the Disaster Mitigation Act of 2000, also known as DMA2K. Among its other features, DMA2K established a requirement that in order to remain eligible for federal disaster assistance and grant funds, localities must develop and adopt hazard mitigation plans as a condition of receiving mitigation project grants under the Pre-Disaster Mitigation (PDM) Program and the Post-Disaster Hazard Mitigation Program (HMGP). On February 26, 2002 (updated October 1, 2002 and October 28, 2003), the Federal Emergency Management Agency (FEMA) published an Interim Final Rule (IFR) updated to the Final Rule (FR) on October 1, 2013 that provides the guidance and regulations under which such plans must be developed. The Final Rule (FR) provides detailed descriptions of both the planning process that localities are required to observe, as well as the contents of the plan that emerges.

Lamar County will continue to comply with all applicable federal and state statutes and regulations related to hazard mitigation planning. In addition, Lamar County will amend its plan whenever necessary to reflect changes in countywide hazard mitigation.

Authority

Section 409 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (public Law 92-228, as amended), Title 44 Code of Federal Regulations, as amended by Section 201 of the Disaster Mitigation Act of 2000 requires that all State and Local Governments develop a Hazard Mitigation Plan as a condition of receiving Federal Disaster Assistance.

Funding

Funding for this plan update was made available through the Hazard Mitigation Grant Program (HMGP). The Alabama Emergency Management Agency (AEMA). The Lamar County EMA Director will facilitate the Lamar County plan update.

Scope

The Lamar County Hazard Mitigation Plan includes all incorporated and unincorporated areas in Lamar County. The plan addresses all natural hazards identified by the Federal Emergency Management Agency (FEMA). All hazards that may affect Lamar County and its residents are identified. Hazard Mitigation strategies are discussed in terms of goals, objectives and mitigation actions. Responsibility for implementation of strategies is discussed and possible funding sources are identified.

Purpose

"Mitigation is the cornerstone of emergency management. It's the ongoing effort to lessen the impact disasters have on people's lives and property through damage prevention and flood insurance" (<http://www.fema.gov/fima/>). The Lamar County Hazard Mitigation Plan is an effort to identify mitigation strategies that address the hazards to which Lamar County is most vulnerable. This plan is only one of many means Lamar County will take to achieve a safer, more hazard-resistant environment for its residents.

**Lamar County, Alabama
Hazard Mitigation Plan**

Section One: Planning Process

Plan update Process

The Hazard Mitigation planning update process began in May of 2013. The Lamar County Mitigation Plan is the representation of the County's commitment to reduce risks from natural hazards. In doing this, the number, location, extent and probability of natural disasters occurring within the area was assessed. Work sheets were given and completed by the Hazard Mitigation Planning Committee members that represented each jurisdiction and or local government participating in the update. These worksheets, which include updating of each jurisdiction's data tables, critical facilities and mitigation strategies, were the basis for the plan. Next, mitigation actions that would reduce the loss of life or property in the areas were considered. In doing this, all jurisdictions, local governments, first responders (police, fire, and medical), and the general public were invited and encouraged to participate.

Continued Public Participation

After the initial plan was completed in 2013, it was available for ongoing public view and comments at the Lamar County Emergency Operations Center, all City and Town Halls, and the Lamar County Courthouse. Each local government were instructed that amendments or additions could be made to that plan at any time. Additional opportunities for comment were provided at annual meetings held by the Lamar County EMA.

Hazard Mitigation Planning Committee

Before beginning the plan update process, Mr. Johnny Bigham, Lamar County EMA Director, to review the hazard mitigation planning committee. Existing members were confirmed to continue service. Replacements were made to fill vacancies as needed, and new members were added to represent local governments participating in the plan for the first time. Mr. Bigham assumed the responsibility as chairman of the Hazard Mitigation Planning Committee and also invited Local Emergency Planning Committee (LEPC) to participate in the planning process. The Hazard Mitigation Committee consisted of the following members:

Lamar County Hazard Mitigation Planning Committee

Johnny Bigham EMA Director	Jim Smith County Engineer
Johnny Rogers Chairman, E-911	Jim Mathis Fire Association President
Mike Roney District 1	Gary Beard District 4
Terry Perkins County Sherriff	Garth Moss Superintendent of Schools
Jennifer Terrell Environmentalist Public Health	Sharon Myers Public Health
Al Elbert Board Member Water Department	Jerry Merchant Supervisor Water Department
Fred Savage Board Member Water Board	Larry Huggins Economic Development Authority

Town of Beaverton

Joe Collier Mayor
Charles Mosley Fire Chief
Tracy Gann Town Clerk

Town of Kennedy

Tim Jenkins Mayor
Becky Akins Town Clerk
Jim Mathis Fire Chief
Jake Fowler Police Chief
James Nabors Water Department

Town of Detroit

Gary Mullins Mayor
Donald Puckett Town Clerk
Cody Wiggington Fire Chief

Town of Millport

Icie Wriley Mayor
Lynnette Ogden Town Clerk
Tim Fields Fire Chief
Charles White Police Chief
Randall McAdams Water Department

City of Sulligent

Scott Boman Mayor
 Gary Mosley City Clerk
 James Guyton Water Department
 Chris Sizemore Fire Chief
 Willis Stanford Police Chief

City of Vernon

Glen Crawford Mayor
 Rebecca Cantrell City Clerk
 Roger Holloway Water Department
 Larry DuBose Fire Chief
 Ted Collins Police Chief

Participation Guidelines

The Chairman of the Hazard Mitigation Planning Committee set forth a list of participation guidelines for the Hazard Mitigation Planning Committee

1. At least one appointed representative from each participating Local government should attend all committee meetings. In the event of extenuating circumstances, the local government may send a non- appointed representative.
2. Each local government should submit requested information to Lamar County EMA in a timely manner. Local governments should meet time frames and deadlines established by the committee. In the event extenuating circumstances, the Hazard Mitigation Planning Committee may approve late submissions.
3. Committee members should fully cooperate with the Lamar County EMA during the update and finalization of the Lamar County Hazard Mitigation Plan by providing the best available information necessary to complete the plan.
4. Each participating jurisdiction must submit a list of prioritized actions. The jurisdiction must provide an analysis of considered mitigation measures. The selected action must identify the hazards being mitigated.

Committee and Public Meeting Schedule and Participation

Each local government was invited to participate in each of the committee meetings. In the event they were unable to attend the meetings they were required to obtain meeting materials from the Lamar County EMA prior to or immediately following the missed meeting. Meeting materials were completed and returned via mail, fax, e-mail, or by scheduling an individual meeting with the Lamar County EMA for the local government to be counted as an active participant in the planning process. The public was also invited and encouraged to participate in all meetings. Public meeting notices were published in the Lamar Democrat and included contact information for assistance. Attendees at the meeting were asked to group themselves by jurisdictions in order to review and complete meeting materials that required collaboration and provide other needed data. Some individuals participated with and contributed to more than one jurisdiction as deemed appropriate.

October 8, 2013 10:00 am Lamar County Meeting # 1

The Chairman of the Hazard Mitigation Committee, Mr. Johnny Bigham opened the meeting. Mr. Bigham reviewed the original plan with committee members and attendees and explained the update process. Mr. Bigham indicated that improvements to the organization and content of the entire plan be considered in order to better meet FEMA guidelines. The committee agreed that Mr. Bigham address organizational and formatting changes to all sections of the plan as necessary. Attendees were given worksheets and other materials related to the agenda topics in order to review and provide data for the update. A total of 20 committee members or designees attended the meeting. No one from the general public was in attendance.

Mike Roney Lamar County Commission
 Anthony Reeves Sherriff's Department
 Terry Roberts Lamar County Commission
 Jennifer Terrell Public Health

Mitchell Puckett Lamar County Commission
 Larry Cox Sulligent Street Department
 Tracy Taylor Sulligent Police Department
 Gary Mosley City of Sulligent

Tim Jenkins	Kennedy Mayor	Becky Akins	Kennedy Town Clerk
Jake Fowler	Kennedy Police Department	Glen Crawford	Vernon Mayor
Gary Beard	Lamar County Commission	Johnny Bigham	Lamar EMA
Al Elbert	Lamar County Water Board	Jerry Merchant	Lamar County Water Department
Larry Smith	Kennedy Water Department	Robert McAdams	Millport Water Department
Chris Sizemore	Lamar County Rescue Squads	Johnny Rogers	Probate Judge/911 Chairman

Each local government covered the following work items in this meeting:

1. Review and update existing plans checklist
2. Update of risk and vulnerability assessment
3. Review historical storm data for designated 10 year period
4. Update critical facilities inventory
5. Review and update the mitigation action goals and actions for National Hazards

No Sign-in sheets with dates are available for this plan.

October 31, 2013 10:00 am Lamar County Meeting # 2

Mr. Bigham opened the meeting. Mr. Bigham led the work session, which included a review of the NFIP Program and current FEMA Flood Map update process, additions to event data and review of critical facilities in flood area. Ten committee members or other designees attended the second meeting. There was no one from the general public in attendance.

Joe Collier Beaverton Mayor	Gary Mullins Detroit Mayor
Robert Shackelford Millport Water Department	Jerry Merchant Lamar County Water
Al Elbert Lamar County Water Board	Gary Mosley Sulligent City Clerk
James Nabors Kennedy Water Department	Rebecca Cantrell Vernon City Clerk
Jody Shelton Lamar County Health Department	Johnny Bigham Lamar EMA

Each local government covered the following work items in this meeting:

1. Add hurricane, flood, tornado, and sinkhole event data
2. Review critical facility list to identify and facilities in the floodplain
3. Discuss flood issues and possible mitigation actions

November 21, 2013 10:00 am Lamar County Meeting # 3

The Chairman of the Hazard Mitigation Committee, Mr. Johnny Bigham, opened the meeting. Mr. Bigham led the work session which focused on updating the goals and objectives of the plan and finalized mitigation actions. There were 11 committee members or their designees in attendance. There was no participation from the general public.

Robert McAdams	Millport Water	Terry Roberts	Lamar County Commission
Garth Moss	School Superintendent	Gary Beard	Lamar County Commission
Johnny Bigham	Lamar EMA	Becky Akins	Kennedy Town Clerk
Gary Mosley	Sulligent City Clerk	Jennifer Terrell	Lamar County Health Department
Rebecca Cantrell	Vernon City Clerk	Al Elbert	Lamar County Water Board
Johnny Rogers	Lamar County Probate Judge		

Each local government covered the following work items in the meeting:

1. Add Mitigation Actions
2. Develop Mitigation Goals and Objectives
3. Identify and Prioritize Mitigation Actions

No Sign-in sheets with dates are available for this plan.

December 18, 2013 10:00 Lamar County Meeting # 4

Johnny Bigham opened the meeting and led the review of the update draft plan. Committee Members had been provided a copy of the draft prior to the meeting. To ensure an all-inclusive opportunity for the public to be involved in the planning process, copies of the draft were also made available prior to the meeting at the Lamar County EMA, and the Lamar County Commission offices along with instructions to submit comments on the plan. There was no one from the general public in attendance, and no comments were received. Thirteen Committee Members or their representatives attended the meeting.

Johnny Bigham	Lamar EMA	Sharon Myers	Lamar County Public Health
Rebecca Cantrell	Vernon City Clerk	Johnny Rogers	Lamar County Probate Judge
Gary Mosley	Sulligent City Clerk	Jennifer Terrell	Lamar County Public Health
Joe L. Collier	Beaverton Mayor	Tommy Dockery	Alabama Department of Public Health
Icie Wriley	Millport Mayor	Karl Byrd	Alabama Forestry Commission
Becky Akins	Kennedy Town Clerk	Tim Jenkins	Kennedy Mayor
Jeff Bradford	Alabama Forestry Commission		

The following work items were covered in the meeting:

1. Review of Draft Plan
2. Comments and Revisions
3. Plan Review and Adoptions Process

The public was afforded an opportunity to review and comment on the final update plan prior to adoption. A request for comments was posted at the library and Lamar County Commission, and Town Hall Offices on November 20th 2013 and a ten-day comment period was provided. Plans were made available for review at the Lamar county EMA office and the Lamar County Courthouse and included instructions for submitting comments.

The names above are the same representatives from the 2010 plan.
No Sign-in sheets with dates are available for this plan.

November 16, 2015

Jeff Bradford took over as the new Lamar County EMA Director on November the 16th, 2015. At that time the 2014 Hazard Mitigation Plan was out of date and had to be revised. Mr. Bradford did not have an electronic copy of the 2014 Hazard Mitigation Plan, so Mr. Bradford retyped the entire plan and sent the electronic copy to the Alabama EMA for approval. Mr. Bradford was told that there needed to be updated information in the plan prior to getting the plan approved. Mr. Bradford researched many different resources to get a more complete plan and sent out notifications to all jurisdictions to review their information and get it back so it can be updated and reviewed before we meet to adopt the 2014 Hazard Mitigation Plan.

January 28, 2016 7:00 pm Meet with the Lamar County Firefighters and Rescue Squad Association

Mr. Bradford meet with the Lamar County Firefighters and Rescue Squads about the 2014 Hazard Mitigation Plan update and what needed to be updated so the Lamar County EMA could complete the Hazard Mitigation Plan. The purpose of this meeting was to get potential input from these volunteer agencies. There were 26 individuals in attendance at this meeting. Sign in sheet follows.

This meeting was open to the public, but no one from the public was present.

LAMAR COUNTY ASSOCIATION OF FIRE FIGHTERS AND RESCUE SQUADS 1-28-2016		
1. Jim Mathis	Kennedy Fire Dept.	
2. Jonathan Norton	AFC	
3. Glenn Crawford	Major City of Vernon	
4. Jerry Marshall	Vernon	
5. Larry DuBose		
6. Taylor Scott	Sulligent Fire / NRS	
7. Jonathan Scott	Sulligent Fire / NRS	
8. Jake Fowler	Kennedy Fire Dept.	
9. Charles Jew	Kennedy Fire Dept.	
10. Chris Spence	Sulligent Fire / North Lamar Rescue	
11. Janie Sizemore	Sulligent Fire / North Lamar Rescue	
12. Brent Treathan	Sulligent Fire / North Lamar Rescue	
13. Fred Savage	Kennedy Fire	
14. Larry Savage	" "	
15. David Bash	Vernon Fire	
16. Tammie Teentelman	Beverton Fire	
17. Charles Naylor	Beverton Fire	
18. Wayne Spence	Beverton Fire	
19. Michael Wilson	Crossville Fire & Rescue	
20. Jeff Bradford	EMA	
21. Allen Gaudin	Vernon of Vernonburg	
22. Blaine Gaudin	Detroit Fire	
23. Derrick Northington	Detroit Fire	
24. Randy McGee	Detroit Fire	
25. Gary Elliott	Crossville Fire & Rescue	
26. Kevin Elliott	Crossville Fire & Rescue	

June 7th Hazard Mitigation meeting Announcements

Hazard Mitigation Meeting
Tuesday, June 7th
Hazard Mitigation meeting will be held June 7th at 10:00 o'clock at the EOC.
There's a book at the Courthouse and EMA Office for review of any interested persons.
The meeting is open to the public.

Hazard Mitigation Meeting
Tuesday, June 7th
Hazard Mitigation meeting will be held June 7th at 10:00 o'clock at the EOC.
There's a book at the Courthouse and EMA Office for review of any interested persons.
The meeting is open to the public.

June 7th Sign-in sheet

Name	Representing	Address	E-mail address	Phone #
Larry DuBose	Lamar Fire	184094 Co RD 549	LAMAR	431-7144
Ray A. Hill	Lamar Co. Fire	118 S.W. Vernon, AL 36089	Lamar Fire Country Ltd. Inc.	678-7108
Al L. G. Smith	Fire Dept	Route 10 Vernon	Standard Fire Dept. Inc.	678-7108
Sam Chapman	EMA	5355 Co Rd 71, Clarks	Sam Chapman@lamarcountygov.com	205-366-2721
Eric Krieger	Town of Millport	P.O. Box 365	Millport Mayor@lamarcountygov.com	205-366-2721
Robbie Atkins	Town of Millport	P.O. Box 365	Millport Mayor@lamarcountygov.com	205-366-2721
Brian McNeal	City of Sulligent	P.O. Box 365	Sulligent Mayor@lamarcountygov.com	678-7111
Chris Sapp	Sulligent Fire / North Lamar	P.O. Box 365	Sulligent Fire Dept. @ lamarcountygov.com	678-7111
Scott Miller	Lamar Co. Fire Dept	P.O. Box 365	Sulligent Fire Dept. @ lamarcountygov.com	678-7111
Danny Thompson	Lamar County	5470 Gulp Rd. Sulligent	ms@lamarcountygov.com	678-7111
Jeff Miller	County Clerk	P.O. Box 365	jeffmiller@lamarcountygov.com	678-7111
Glenn Gaudin	County Clerk	P.O. Box 365	jeffmiller@lamarcountygov.com	678-7111
Mike Roper	County Clerk	P.O. Box 365	jeffmiller@lamarcountygov.com	678-7111
Sam Russell	EMA	P.O. Box 365	jeffmiller@lamarcountygov.com	678-7111
Michael Pickett	EMA	P.O. Box 365	jeffmiller@lamarcountygov.com	678-7111
Karl Byrd	PL Fire Dept	4898 Hwy 11 Sulligent	Karl Byrd@lamarcountygov.com	712-8934
John Rogers	Lamar County	P.O. Box 365	John Rogers@lamarcountygov.com	678-7111
Freda Davis	North Lamar Rescue	P.O. Box 365	Freda Davis@lamarcountygov.com	678-7111
Sam Russell	County Clerk	P.O. Box 365	jeffmiller@lamarcountygov.com	678-7111
Jeff Bradford	Lamar County EMA	P.O. Box 365	jeffmiller@lamarcountygov.com	678-7111

June 7, 2016 10 am Hazard Mitigation Meeting

Mr. Bradford opened the meeting and discussed the latest update of the Hazard Mitigation Plan. The jurisdictions had received a copy of the Hazard Mitigation Plan prior to the meeting so they could review their individual sections and input the current information. There were also copies made available at the Lamar County Courthouse and the Lamar County EMA office for Public review. There were 20 members present at the meeting.

Jeff Bradford	Lamar County EMA	Johnny Rogers	Lamar County Probate Judge
Mike Roney	Lamar County Dist. # 1	Mitchell Puckett	Lamar County Dist. # 2
Terry Roberts	Lamar County Dist. # 3	Gary Beard	Lamar County Dist. # 4
Josh Knight	Lamar County Engineer	Scott Walker	Lamar County Board of Education
Karon Hall	Lamar County 911	Larry Dubose	Lamar County Fire & Rescue Association
Allen Chandler	Vernon Fire Dept.	Rebecca Akins	Town of Kennedy
Icie Wriley	Town of Millport	Gary Mosley	City of Sulligent
Glenn Crawford	City of Vernon	Chris Sizemore	Sulligent Fire/North Lamar Rescue
Karl Byrd	Alabama Forestry	Danny Thompson	Lamar County Sheriff's Department
Sam Guerrera	Alabama EMA	Freed R. Savage	Lamar Co. Gas/South Lamar Rescue

The following work items were covered in the meeting:

- 1. Review of Mitigation Plan**
- 2. Revisions and Comments**
- 3. Hazard Mitigation Plan Resolution Adoption Procedures.**

The public was given an opportunity to review and comment on the Hazard Mitigation Plan but no one gave any suggestions or reviews.

Interagency and Intergovernmental Coordination

Interagency and intergovernmental coordination also played a vital part in the development of this plan. Each of the agencies listed below were contacted via mail, e-mail, fax or telephone requesting the best available data that they could contribute to the development of the plan. All information provided was beneficial in completing the risk and vulnerability assessments.

Federal Agencies

National Weather Service provided storm event data
United States Geological Survey provided information on earthquakes, sinkholes, landslides, and subsidence.
U. S. Army Corp of Engineers provided the National Inventory of Dams.
Federal Emergency Management Agency
U. S. Department of Transportation's Hazardous Material Information System provided event data.

State Agencies

Alabama Emergency Management Agency provided hurricane damage data.
Geological Survey of Alabama provided information on earthquakes, sinkholes, and landslides.
Alabama Department of Economic and Community Affairs provided the Alabama Drought Management Plan, National Flood Insurance Program information and FEMA flood map update information.
Alabama Forestry Commission provided information regarding wildfires.

Local Agencies

Lamar County EMA provided assistance in gathering data.
Academia
University of Alabama
 Department of Geology
 Cartographic Research Lab

Integration with Existing Plans

The committee was careful when updating the plan so that it would not contradict or conflict with any existing local subdivision regulations, zoning ordinances, comprehensive plans, or standard building codes. Table 1-1 provides a list of existing plans by jurisdiction.

Plan Adoption

All jurisdictions in Lamar County, along with the Lamar County School Board and the Lamar County Volunteer Firefighters and Rescue Squad Association have actively participated in the planning process. Representatives from each local government attended each of the meetings and provided completed worksheets that were vital in the update of the plan. Upon completion of the plan each of the six municipalities (Beaverton, Detroit, Kennedy, Millport, Sulligent, and Vernon) along with the Lamar County Commission, Lamar County School Board, Lamar County Volunteer Firefighters and Rescue Squad Association, passed formal resolutions adopting the Lamar County Hazard mitigation Plan. By adopting this Multi-Jurisdictional Hazard Mitigation Plan, Lamar County and the listed local governments will be eligible for mitigation grant funds through the Pre-Disaster Mitigation Program (PDM), Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance Program (FMA), Repetitive Flood Claims Program (RFC), and the Severe Repetitive Loss Program (SRL). Adopting Resolutions can be found in Appendix II.

Table 1-1: Lamar County Existing Plans by Jurisdiction							
Plan/Policy	Beaverton	Detroit	Kennedy	Millport	Sulligent	Vernon	Unincorporated County
Comprehensive Plan	N	Y	Y	Y	N	N	Y
Strategic Plan	N	Y	Y	Y	N	Y	Y
Growth Management Plan	N	N	N	N	N	N	N
Capital Improvement Plan	N	N	N	Y	N	Y	N
Zoning Ordinance	N	N	N	Y	N	Y	N
Building Code	N	N	Y	N	N	Y	N
Floodplain Management Plan	N	N	Y	Y	N	Y	Y
Elevation Certificates	N	N	N	N	N	N	Y
Drainage Ordinance	N	N	N	N	N	N	N
Emergency Management Plan	N	Y	Y	Y	N	Y	Y
Critical Facilities Map	N	N	Y	Y	N	N	Y
Existing land Use Map	N	N	N	N	N	N	Y
State Plan	N	N	N	N	N	N	Y
Hazard mitigation	Y	Y	Y	Y	Y	Y	Y
Strategic National Stockpile Plan	N	N	Y	Y	N	N	Y
Other	N	N	N	N	N	N	N
Source: Participating Jurisdictions							

**Lamar County, Alabama
Hazard Mitigation Plan**

Section Two: General Characteristics

Lamar County is located in west central Alabama along the state's western border. Fayette, Pickens and Marion Counties in Alabama and Lowndes and Monroe Counties in east Mississippi border Lamar County. The county has 605 square miles of land area and approximately 62 square miles of water area as reported by the 2014 Census. Lamar County contains six municipalities: the Towns of Beaverton, Detroit, Kennedy and Millport and the Cities of Sulligent and Vernon. See Map 2-1: Lamar County General Location Map. Lamar County is governed by a Probate Judge, who serves as the Chairman of the Lamar County Commission and Lamar County Commissioners, who are elected by citizens in their commission districts. An elected Mayor and Council serve each municipality. The City of Vernon serves as the Lamar County seat while the City of Sulligent is the predominant center for local business and trade.

Lamar County has one airport located south of Sulligent. The airport does not provide commercial service. Two rail lines serve the county, one in the north that runs through Beaverton and Sulligent, and the other in the south that goes through Kennedy and Millport. Utilities in Lamar County include electricity, gas, water, sewer, and solid waste. Alabama Power provides electrical service and gas is supplied by Alabama Gas Corporation. AT&T provides telecommunication services. Water and sewer service is provided by municipal or rural systems. The cities of Sulligent and Vernon and Town of Millport operate sewer systems. The Town of Kennedy has a collection system that pumps sewage to Millport for treatment. Most unincorporated areas are serviced only by septic tanks. Lamar County operates a solid waste collection program and inert landfill.

Growth Trends

Lamar County's population has been declining over the past twenty years. All municipalities have experienced losses in population, many in double digits, with the exception of the City of Sulligent, which has had only a minimal increase. Map 2-2: Lamar County Population Density depicts population concentrations in Lamar County. Table 2-1 below shows the growth trends for the County and its municipalities compared to the Alabama Association of Regional Council's (AARC) Region 2 and the State of Alabama. Region 2 contains Bibb, Fayette, Greene, Hale, Lamar, Pickens, and Tuscaloosa Counties.

Table 2-1: Growth Trends 2010-2014

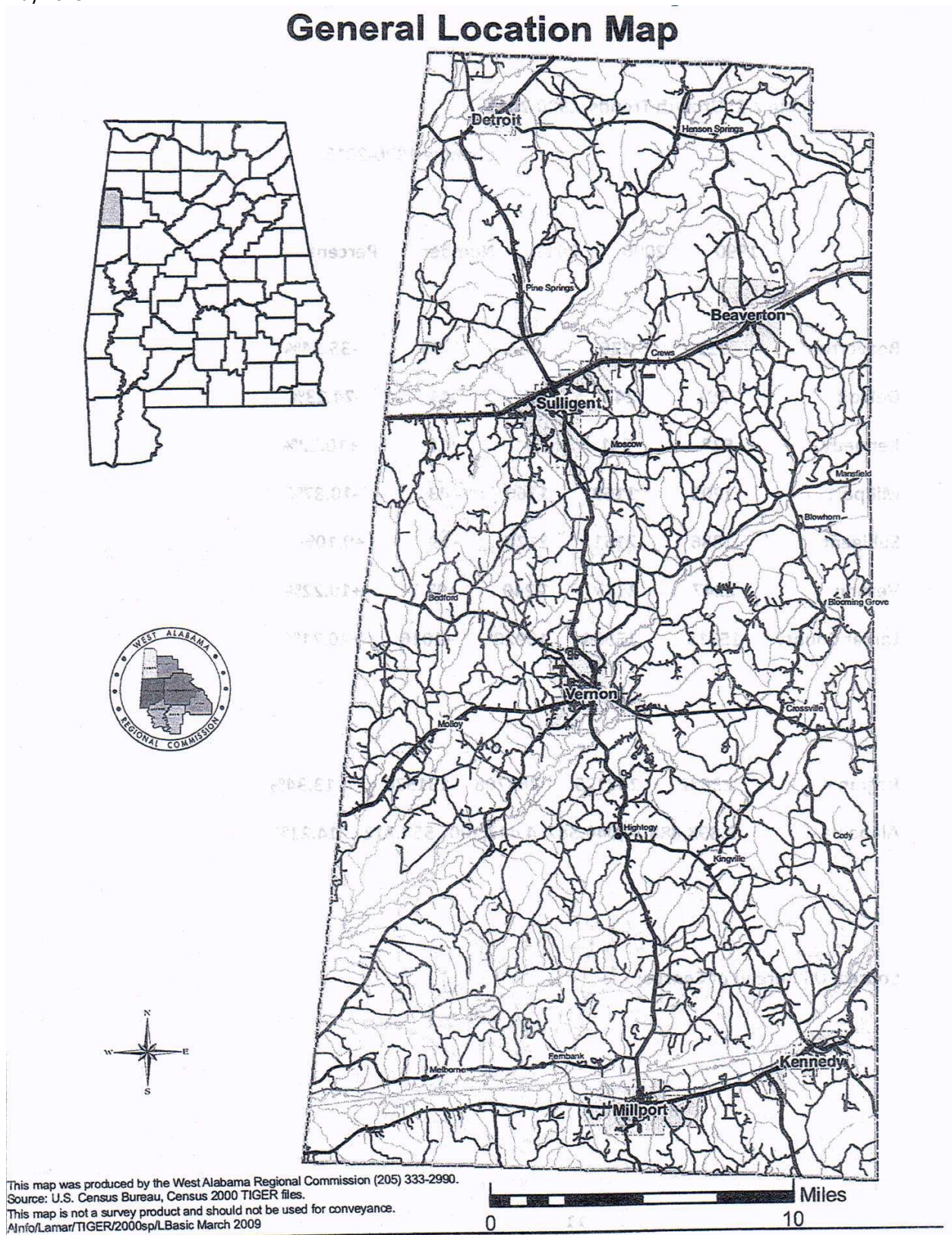
Annual Estimates of the Population in Alabama Cities and Towns by County: April 1, 2010 to July 1, 2014

2014 Population

Estimates

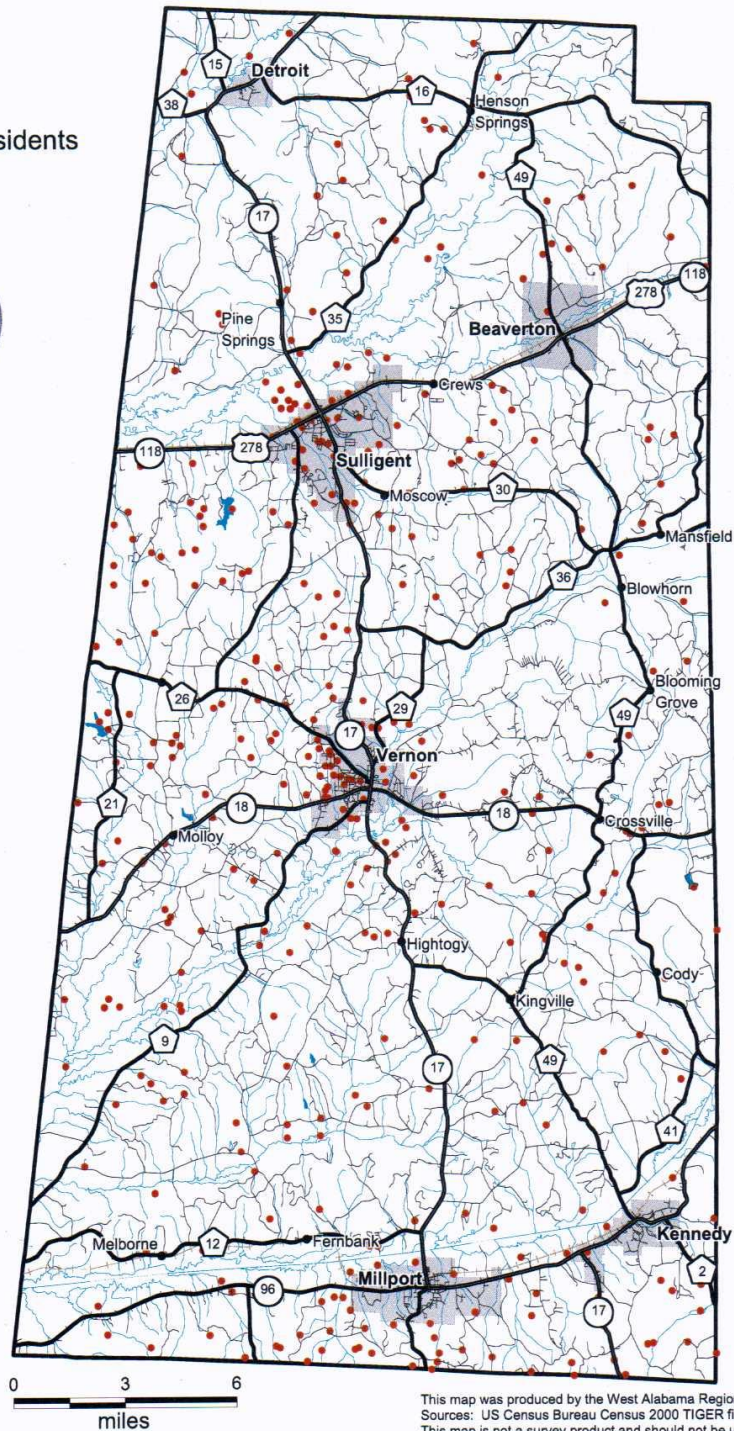
	April 1, 2010		Population Estimates (as of July 1)					Change, 2010-2014	
	Census	Est. Base	2010	2011	2012	2013	2014	Number	Percent
Alabama	4,779,736	4,780,127	4,785,822	4,801,695	4,817,484	4,833,996	4,849,377	- 63,555	-0.1
Lamar County	14,564	14,564	14,499	14,295	14,255	14,203	14,086	- 413	- 0.2
Beaverton	201	195	194	192	191	191	189	- 5	- 0.2
Detroit	237	237	236	233	232	232	230	- 6	- 0.2
Kennedy	447	447	445	439	438	437	434	- 11	- 0.2
Millport	1,049	1,049	1,044	1,031	1,029	1,024	1,014	- 30	- 0.2
Sulligent	1,927	1,927	1,919	1,893	1,889	1,884	1,870	4 49	- 0.2
Vernon	2,000	2,000	1,991	1,961	1,953	1,944	1,926	- 65	- 0.3

Balance of Lamar County	8,703	8,709	8,670	8,546	8,523	8,491	8,423	- 247	- 0.2
Source: U.S. Census Bureau, Population Division, and Center for Business and Economic Research, The University of Alabama, May 2015.									



Map 2-2: Lamar County Population Density Map

1 Dot = 40 Residents



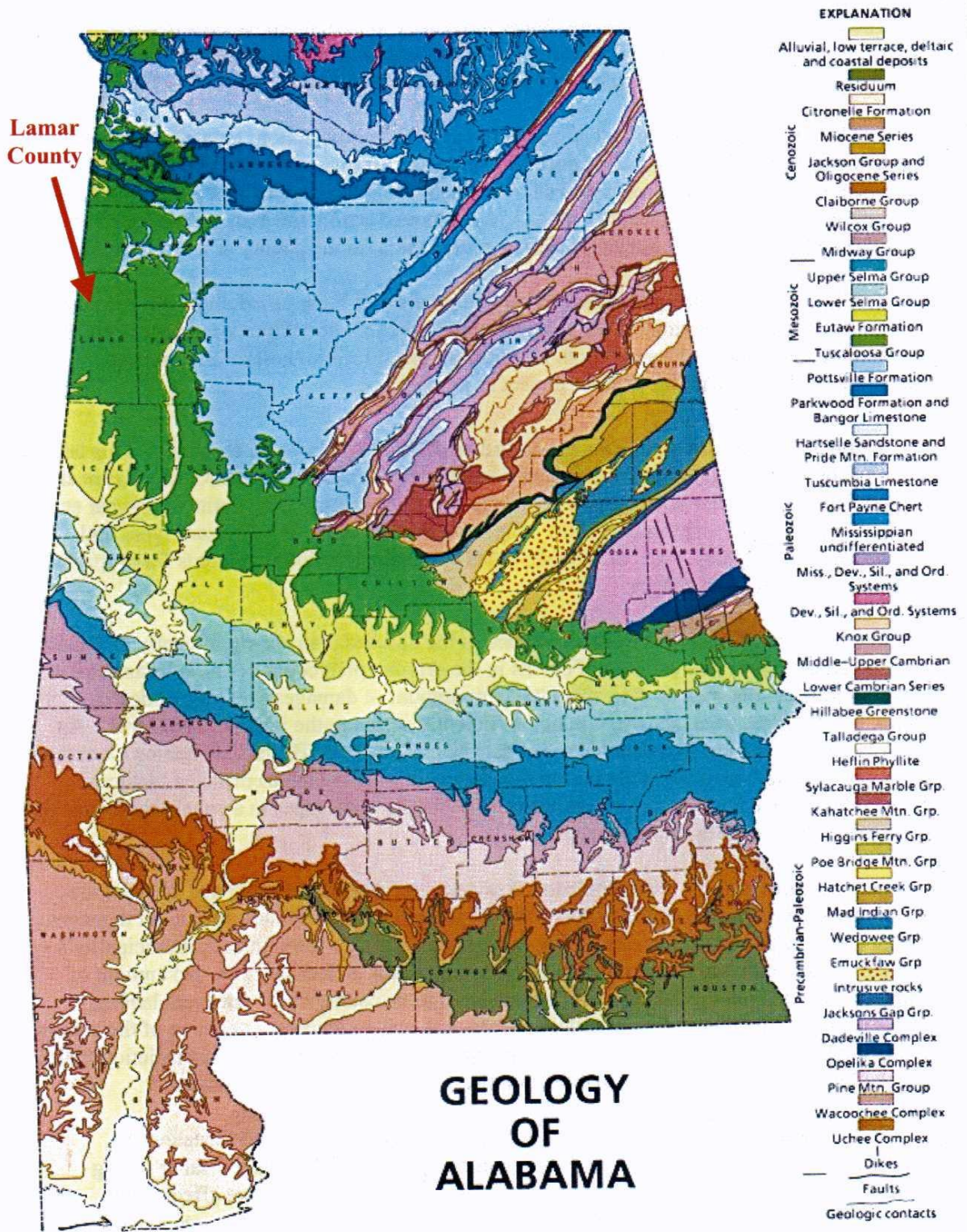
This map was produced by the West Alabama Regional Commission (205 333-2990).
Sources: US Census Bureau Census 2000 TIGER files.
This map is not a survey product and should not be used for conveyance.
MInfo/Lamar/TIGER/2000sp/Lpopdens Mar 2009

General Geology

Lamar County lies within the Fall Line Hills district of the East Gulf Coastal Plain, which is part of the Coastal Plain physiographic province. Mature hills of moderate relief separated by stream valleys characterize this region. Altitudes range from 250 feet in the west to 750 feet in the northeastern part of the county.

Geologic units exposed in the county range from youngest to oldest—Eutaw, Gordo, Coker, and Pottsville formation of the Pennsylvanian age. Exposed Pottsville formation found in the valley of the Buttahatchee River in the northeastern portion consists mainly of sandstone, conglomerate, siltstone and shale. This formation dips to the southwest at about 75 feet per mile. The Cretaceous system, consisting of the Coker, Gordo, and Eutaw formations, consists of mostly inter bedded sands and clays. The Eutaw formation is only exposed as outliers on hilltops in the southwestern corner of the county. It is underlain by the Gordo formation, which is the most exposed formation of the county. It is underlain by the Coker formation. Low terrace deposits and alluvium of Quaternary age are exposed mainly along the stream valleys throughout the county. This consists mainly of sand and gravel with occasional silt.

Figure 2-1: Geology of Alabama



Source: The University of Alabama Geology Department online at <http://www.geo.ua.edu/>

**Lamar County, Alabama
Hazard Mitigation Plan**

Section Three: Risk Assessment

The risk assessment process is necessary to identify those natural hazards that pose a threat to Lamar County and its Municipal Jurisdictions. This Process used information provided by members of the Lamar County Hazard Mitigation Planning Committee to identify these Hazards as Drought, Flooding, Hailstorm, Hurricane/Tropical Storm, Lightning, Thunderstorms and High Winds, Winter Weather, Earthquake, and Wildfire.

Table 3-1 shows the hazards that pose a threat to each jurisdiction. Identification of these hazards was based on historical occurrences and the vulnerability of the jurisdiction to a future occurrence. Each jurisdiction was responsible for identifying the hazards that pose a threat to their community. Tsunami/Volcano/Typhoon was removed during the plan update based on committee consensus that the hazard(s) did not pose a threat to the county or its jurisdictions.

Table 3-1: Lamar County Hazard Identification by Jurisdiction							
Natural Hazards	Beaverto n	Detroi t	Kenned y	Millpor t	Sulligen t	Verno n	Unincorporate d County
Thunderstorm/Win d	X	X	X	X	X	X	X
Lightning	X	X	X	X	X	X	X
Hail	X	X	X	X	X	X	X
Tornado	X	X	X	X	X	X	X
Flood	X	X	X	X	X	X	X
Drought/Extreme Heat	X	X	X	X	X	X	X
Winter Storm	X	X	X	X	X	X	X
Hurricane/Tropical Storm	X	X	X	X	X	X	X
Sinkhole/Expansive Soils	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Landslide	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Earthquake	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wildfire	X	X	X	X	X	X	X
Dam/Levee Failure	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Key: X = Affects the Jurisdiction N/A = Not a threat to the jurisdiction							
Source: Participating Jurisdiction							

Table 3-2 provides the prioritized threat by jurisdiction. Each jurisdiction was responsible for providing hazard information with consideration to the number of past occurrences and the impacts of the hazard on the jurisdiction. Hazards are prioritized highest to least impact designating the hazard with the highest impact as number one.

Table 3-2: Lamar County Prioritized Threat by Jurisdiction							
Natural Hazards	Beaverto n	Detroi t	Kenned y	Millpor t	Sulligen t	Verno n	Unincorporate d County
Thunderstorm/Win d	2	2	2	3	1	2	2
Lightning	4	5	6	6	2	3	3
Hail	6	7	7	7	7	8	4
Tornado	1	3	3	2	4	6	1
Flood	5	9	4	4	6	5	5

Drought/Extreme Heat	8	8	8	8	5	4	6
Winter Storm	3	1	1	1	3	1	7
Hurricane/Tropical Storm	9	4	9	9	9	9	8
Sinkhole/Expansive Soils	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Landslide	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Earthquake	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wildfire	7	6	5	5	8	7	9
Dam/Levee Failure	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hazards are prioritized with the highest threat assigned number one: 1 - 13							
Source: Participating Jurisdiction							

The individual hazard profiles is the cornerstone for this section. The hazard profiles contains data from the National Oceanic and Atmospheric Administration (NOAA)-National Weather Service and other noted sources combined with local input for a defined multi-year study period. The Current Information available at the time of research is displayed in individual hazard profiles. The individual hazard profile table shows events for all hazard types and provides the year of incident, date, type, magnitude, deaths, injuries, and dollar amounts for property and crop damages, and total damages.

The numbers of historical events provided in the updated plan are significantly different from the original plan. The number of events in the original plan could not be substantiated and did not provide details such as date, magnitude, or amount of damages, injuries, or deaths. Further, NOAA data, when shown, was not sufficiently sorted to the jurisdictional level. As FEMA guidelines request that detailed event data be provided, the Hazard Mitigation Committee agreed upon the new multi-year study period as a means of establishing a corrected historical reference that utilized verifiable sources while allowing for local input in a consistent format that can be easily built upon in future updates.

Event locations in the table labeled as "countywide" refer to an event that affected the entire county, including all municipalities within. If there is an associated amount of damages, they are assumed to be countywide. Countywide events are not listed in each municipality's event table in the individual Jurisdiction Assessment located in Section Five. No amount of damages is listed given the damages were considered to be countywide. An event labeled "Lamar County/Crossville" for example, indicates a specific unincorporated area of the county was identified as affected. Such events will not be repeated in the individual jurisdiction tables since the location was site specific and did not affect an incorporated jurisdiction.

Some events provided by the National Weather Service are reported as statewide occurrences. Hurricanes, droughts, and winter storms often have this type of far-reaching impact. In cases such as this, the event is shown as a countywide event that affected all municipalities. Any statewide damage figures provided by NOAA were not used in the individual hazard profiles. If available from the jurisdiction, damage amounts are shown as Local Input.

I. Thunderstorm Profile

There are 4 classifications of thunderstorms: Single Cell, Multi Cell, Severe, and Super Cell. Lamar County has experienced all 4 classifications of Thunderstorms. A thunderstorm is a convective cloud that often produces heavy rain, wind gusts, thunder, lightning, and hail. Lamar County experiences many thunderstorms each year. The County is most susceptible to thunderstorms during the spring, summer, and late fall. Most of the damage caused by thunderstorms results from straight-line winds, lightning, flash flooding, and hail, occasionally, thunderstorms will spawn tornados.

Previous Occurrences. According to the National Center for Environmental Information data, there have been 128 significant thunderstorm events and 7 strong wind events in Lamar County from 2004 through 2015.

Thunderstorms/Wind January 1, 2004 - December 31, 2015

Year	Number of Events	Property Damage	Crop Damage	Comments
2004	4	\$16,000	0	
2005	3	\$75,000	0	
2006	10	\$109,000	0	
2007	7	\$34,000	0	
2008	10	\$24,500	0	
2009	24	\$63,000	0	
2010	14	\$96,000	0	
2011	11	\$80,500	0	
2012	18		0	
2013	6	0	0	
2014	11	0	0	
2015	10	0	0	
Totals	128	\$498,000	0	

Source: National Center for Environmental Information

Strong Winds January 1 2004 - December 31, 2015

Year	Number of Events	Property Damage	Crop Damage	Comments
2004	0	0	0	
2005	0	0	0	
2006	1	\$2,000	0	
2007	1	\$20,000	0	
2008	2	\$70,000	0	
2009	3	\$261,000	0	
2010	0	0	0	
2011	0	0	0	
2012	0	0	0	
2013	0	0	0	
2014	0	0	0	
2015	0	0	0	
Totals	7	\$353,000	0	

Source: National Center for Environmental Information

Location. Thunderstorms and Strong Winds occurred throughout Lamar County.

Extent. Lamar County experienced 128 thunderstorm events and 7 strong wind events in an 11 year period resulting in a 2.9% probability that a thunderstorm event will occur on an annual basis. The study period from January 1, 2004 - January 1, 2016 (4,384 days) shows there were 75 days the thunderstorm events occurred with 49 of those days resulting in \$498,000 in property damage. On March 9, 2006 one of the worst thunderstorms in the study period recorded 75 knot winds producing \$80,000 in property damage.

Primary Effects from thunderstorms in Lamar County would include:

1. High Winds, Straight- line Winds
2. Lightning
3. Flooding
4. Hail
5. Spawning Tornados

Hazardous results from significant thunderstorms in Lamar County would include:

1. High winds can cause downed trees and electrical lines resulting in loss of power
2. Severe storms are capable of producing intense lightning that poses many threats to people and infrastructure and can ignite fires.
3. Heavy rains can produce severe storm water run-off in developed areas and cause bodies of water to breach their banks.
4. Large hail can injure people and livestock and damage crops.
5. Severe thunderstorms can produce tornados that destroy anything in its path, resulting in loss of power, shelter, and potential loss of life.

II. Lightning Profile

Lightning is a natural phenomenon associated with all thunderstorms, but can occur in the absence of a storm. Each jurisdiction is at risk for lightning strikes during a thunderstorm. Lightning strikes can cause power outages, fires, electrocution, and disruptions to communication systems.

Previous Occurrences. The National Center for Environmental Information showed three reports of lightning occurred in Lamar County between 2004 and 2015. One injury was reported in a Sulligent lightning event in 2005. Together the events during the study period caused \$32, 000 in property damage. One reported event caused a fire that burned 30 acres.

Lightning January 1, 2004 - December 31, 2015						
Year	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Comments
2004	2	0	0	\$32,000	0	
2005	1	0	0	0	0	
2006-2015	0	0	0	0	0	
Totals	3	0	0	\$32,000	0	

Source: National Center for Environmental Information

Location: Lightning can occurs throughout Lamar County.

Extent. According to the website <http://www.lightningsafety.noaa.gov/stats/08 Vaisala NLDN Poster.pdf> Lamar County had 6-8 fl/sq km/yr of cloud to ground lightning in the study period from 1997-2007. Lamar County experienced 3 lightning events in an 11 year period resulting in a 6% probability that a Lightning event will occur on an annual basis. The study period from January 1, 2004 - January 1, 2016 (4,384 days) shows there were 3 days the lightning events occurred with 2 of those days resulting in \$32,000 in property damage. On June 13, 2004 a lightning event produced \$22,000 in property damage.

Primary Effects from Lightning in Lamar County would include:

1. Power Outages
2. Wild Fires
3. Electrocution
4. Disruption of Communication Waves

Hazardous results for significant Lightning in Lamar County would include:

1. Power outages result in tremendous losses for food distributors and individuals due to loss of refrigeration as well as disruptions to routine business operations,
2. Fires destroy most everything it comes in contact with and also can be detrimental to the health of any living organism due to the massive smoke cloud it produces.
3. Electrocution of electronic device such as water and sewer pumps can cause disruption in service leading to unsanitary conditions and lack of potable water.
4. Disrupted communications from electrical storms can result in inability to communicate with other agencies, making preparation or recovery from a storm nearly impossible.

III. Hail Profile

Hail is a solid form of precipitation, consisting of balls or lumps of ice, frequently associated with severe thunderstorms. Thunderstorms have been known to produce hailstones one-quarter inch in diameter or larger.

Previous Occurrences. The National Center for Environmental Information reported 57 occasions where hail was present between 2004 and 2015. Hail has the potential to cause major property damage. An estimated \$28,000 in property damage has occurred as a result of hail events in Lamar County. Hail has been reported from pea size to 1.75" in diameter in Lamar County.

Hail January 1, 2004 - December 31, 2015				
Year	Number of Events	Property Damage	Crop Damage	Comments
2004	2	0	0	
2005	4	\$13,000	0	
2006	7	0	0	
2007	3	0	0	
2008	5	0	0	
2009	11	0	0	
2010	11	\$15,000	0	
2011	12	0	0	
2013	0	0	0	
2014	0	0	0	
2015	2	0	0	
Totals	57	\$28,000	0	

Source: National Center for Environmental Information

Location: Each jurisdiction in Lamar County is vulnerable to experiencing hailstorms.

Extent. Lamar County experienced 57 Hail events in an 11 year period resulting in a 1.3% probability that a Hail event will occur on an annual basis. The study period from January 1, 2004 - January 1, 2016 (4,384 days) shows there were 39 days the lightning events occurred with 2 of those days resulting in \$28,000 in property damage. On April 21, 2005 Sulligent received 1.75" hail producing \$9,000 in property damage.

Primary Effects from Hail in Lamar County would include:

1. Property Damage
2. Crop Damage
3. Communication equipment damage
4. Livestock loss and injury

Hazardous results from significant Hail in Lamar County would include:

1. Any size hail can damage exposed real and personal property. Hail is a major problem for car dealerships, as the unprotected lots of cars receive major damage.
2. Heavy hail is capable of destroying entire crop yields. Farmers of above ground crops are especially concerned with hail as it is extremely detrimental to the crop.
3. Communication equipment, such as receivers, is susceptible to large hail. These instruments can be seriously damaged or destroyed by large hail.
4. Large hail is a danger to livestock of all sorts and is a threat farmers must consider. Hundreds of thousands of dollars are invested in these animals, which may be injured or killed in a hailstorm.

IV. Tornado Profile

Tornados are rotating columns of air extending downward to the ground with recorded winds in excess of 300 miles per hour. They are highly localized events, most of which last for a short period of time and have a limited destruction path. In Alabama the typical tornado season extends from March through early June, with April and June being peak months for tornado activity. Additionally, Alabama experiences a secondary tornado season from November through December. Figure 3-1 shows the general paths of tornados across the United States.

Figure 3-2 shows the FEMA designated wind zones in the United States. Lamar County is located in Zone IV, which warrants profiling. Zone IV has witnessed a higher frequency of tornados than any other zone. Zone IV has also witnessed some of the deadliest tornados in history.

Previous Occurrences. The National Center for Environmental Information and local sources have reported 17 tornados in Lamar County since 2004. Tornados have the highest threat for the potential loss of life and property in Lamar County. Previous tornados have resulted in loss of life, destroyed homes and timber, blocked roadways, caused power outages and displaced residences.

Tornados
January 1, 2004 - December 31, 2015

Year	Number of Events	Deaths	Injuries	Property Damage	Crop Damage	Comments
2004	2			\$330,000	0	F-1, F-2
2005	3			\$91,000	0	2 F-0, F-1
2006	2			\$26,000	0	2 F-0
2007	1			0	0	EF-0
2008	2			\$155,000	0	EF-3, EF-1
2009	3			\$15,000	0	EF-1, 2 EF-0
2010	1			\$145,000	0	EF-1
2011	0			0	0	
2012	0			0	0	
2013	1			0	0	EF-1
2014	2			0	0	EF-1, EF-0
2015	0			0	0	
Totals	17	0	0	\$762,000	0	

Source: National Center for Environmental Information

Location: Each jurisdiction has been affected by tornado activity in the past. The location of Lamar County in wind zone IV, past occurrences of tornados, and the potential for future occurrences to cause damage, death, and injuries leaves Lamar County vulnerable to tornados.

Extent. Lamar County experienced 17 Tornado events in an 11 year period resulting in a 3.8% probability that a Tornado event will occur on an annual basis. The study period from January 1, 2004 - January 1, 2016 (4,384 days) shows there were 15 days the lightning events occurred with 10 of those days resulting in \$762,000 in property damage. One of the most severe tornados, an EF-3, Occurred in the Molloy Community on January 10, 2008 producing \$105,000 in property damage.

Primary effects from Tornados in Lamar County would include:

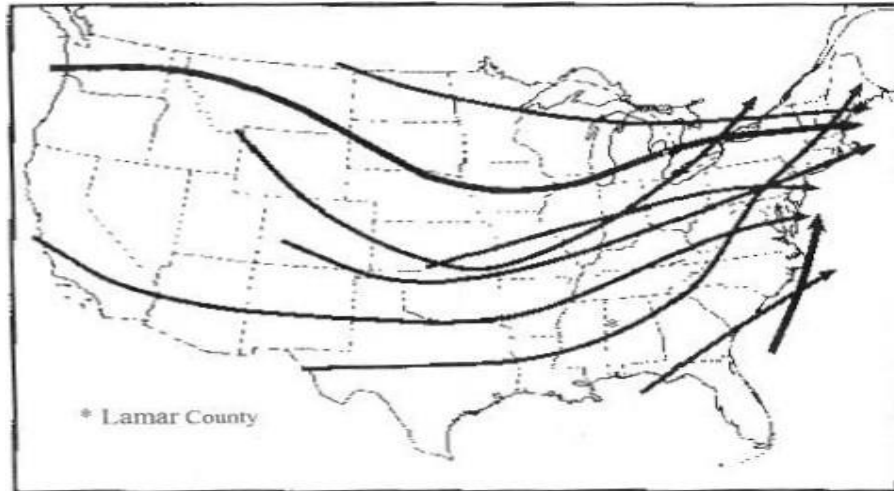
1. Loss of life
2. Property damage
3. Infrastructure destruction and damage
4. Sanitation and water delivery interruption

Hazardous results from significant Tornados in Lamar County would include:

1. Collapse of structures can leave people homeless.
2. Roadways may become blocked by debris. Damage may destroy automobiles, creating additional hardships to individuals and families and business operations.

3. High wind speeds associated with a tornado can destroy anything in its path. Power poles topple, communication receivers are destroyed, and water sanitation and treatment plants are offline.
4. Due to destruction, sanitation crews are unable to remove massive amounts of waste, and water delivery is disrupted. This can lead to an increase in disease-carrying insects and lack of potable water.

Figure 3-1: Generalized Tornado Paths



Source: Chermock, Ralph L. 1976. *Hurricanes and Tornadoes in Alabama*
Geological Survey of Alabama, Pg.28

Figure 3-2: Wind Zones in the United States



Source: <http://energyshelter.com/windzonemap.htm>

Tornados are now measured using the new enhanced Fujita Tornado Scale by examining the damage caused by the tornado after it passes over man-made structures and vegetation. The new scale was put into use in February of 2007. Due to the study period of the plan, which goes through 2015, events shown above

express the magnitude of tornados using the original Fujita Scale. Below is a table comparing the estimated winds in the original F-scale and the operational EF-scale that is currently in use by the National Weather Service. Like the original scale there are six categories from zero to five that represent damage in increasing degrees.

The new scale incorporates the use of 28 Damage Indicators and 8 Degrees of Damage to assign a rating. Detailed information can be found at the following link EF-scale documentation which includes additional enhanced descriptions of damage to multiple types of structures and vegetation with photographs, a PC-based expert system, and enhanced training materials.

Table 3-3

Fujita Scale (Developed in 1971, used through January 2007)		
Rating	Winds	Expected Damage
F0	< 73 mph	Light damage. Damage to chimneys and billboards; branches broken off trees; shallow-rooted trees pushed over.
F1	73-112 mph	Moderate damage. Surface peeled off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206 mph	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown.
F4	207-260 mph	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown some distance; cars thrown and large missiles generated.
F5	261-318 mph	Incredible damage. Strong frame houses leveled and foundations swept clean of debris; automobile-sized missiles fly through the air in excess of 100 meters; trees debarked; incredible phenomena occur.
Enhanced Fujita Scale (Implemented February 2007)		
Rating	Winds	Expected Damage
EF0	65-85 mph	Minor damage. Shingles or parts of roof peeled off; damage to gutters/siding; branches broken off; shallow-rooted trees toppled.
EF1	86-110 mph	Moderate damage. More significant roof damage; windows broken; exterior doors damaged or lost; mobile homes badly damaged or overturned.
EF2	111-135 mph	Considerable damage. Roofs torn off well-constructed homes; homes shifted off their foundation; mobile homes completely destroyed; large trees snapped or uprooted; cars may be tossed.
EF3	136-165 mph	Severe damage. Entire stories of well-constructed homes destroyed; significant damage to large buildings; homes with weak foundations may be blown away; trees begin to lose bark.
EF4	166-200 mph	Extreme damage. Well-constructed homes leveled; cars thrown significant distances; top story exterior walls of masonry buildings likely collapse.
EF5	> 200 mph	Incredible damage. Well-constructed homes swept away; steel-reinforced concrete structures critically damaged; high-rise buildings sustain severe structural damage; trees usually completely debarked, stripped of branches, and snapped.

<http://www.ncdc.noaa.gov/oa/satellite/fujita.html>

V.Flood Profile

There are three types of flooding that affect Lamar County: (1) general flooding, (2) storm water runoff, and (3) flash flooding. General flooding occurs in areas where development has encroached into flood-prone areas. Storm water runoff causes flooding in areas that have inadequate drainage systems. Flash flooding is caused when a large amount of rain falls within a short period of time.

Previous Occurrences. The National Center for Environmental Information shows 6 severe flooding events in Lamar County between 2004 and 2015. There were 48 occurrences of flash flooding in Lamar County between 2004 and 2015. Damages from these events totaled \$366,000 in property damage.

On January 6, 2009 3-5 inches of rain fell during a two-day period and caused flash flooding and washed out numerous roads. Again on February 28, 2009 the county received a reported 4-6 inches of rainfall. A total of ten 10' culverts were destroyed as roadways were washed out; numerous roads were closed and school was cancelled. No injuries were reported, combined damages to roads and bridges for the two events totaled over \$105,000.

Flood
January 1, 2004 - December 31, 2015

Year	Number of Events	Property Damage	Crop Damage	Comments
2004-2010	0	0	0	
2011	2	0	0	
2012	0	0	0	
2013	1	0	0	
2014	2	0	0	
2015	1	0	0	
Totals	6	0	0	

Source: National Center for Environmental Information

Flash Floods
January 1, 2004 - December 31, 2015

Year	Number of Events	Property Damage	Crop Damage	Comments
2004	5	\$23,000	0	
2005	2	\$9,000	0	
2006	0	0	0	
2007	1	0	0	
2008	1	0	0	
2009	16	\$249,000	0	
2010	4	\$70,000	0	
2011	8	\$15,000	0	
2012	7	0	0	
2013	1	0	0	
2014	2	0	0	
2015	1	0	0	
Totals	48	\$366,000	0	

Source: National Center for Environmental Information

Location: Flash flooding and flooding in general cause problems in low lying areas of Lamar County due to drainage facilities not being able to handle the volume of water produced from storm runoff.

Extent. Lamar County experienced 6 flooding events and 48 flash flooding events in an 11 year period resulting in a 1.3% probability that a flooding event will occur on an annual basis. The study period from January 1, 2004 - January 1, 2016 (4,384 days) shows there were 5 days the flooding events and 42 days the flash flooding occurred with 19 of those days resulting in \$366,000 in property damage. On January 6, 2009 flash flooding caused \$100,000 in property damage and again in December 8, 2009 flash flooding caused \$100,000 of property damage.

Primary Effects from Floods in Lamar County would include:

1. Loss of life
2. Property damage
3. Crop damage
4. Dam and levee failure

Hazardous results from significant flood in Lamar County would include.

1. Rising water levels can quickly sweep people along in its path.
2. Rapidly moving water destroys anything in its path and also leaves hazardous mold and breeds insects.
3. Periods of standing water kills inadaptible plants, and flowing water removes sediment and nutrients from the soil.
4. Breached dams and levees allow water to flood into the surrounding floodplain resulting in destruction of crops and property.

Flood Assessment Tools**Programs**

Lamar County participates in the National Flood Insurance Program (NFIP). The NFIP allows property owners to purchase federally sponsored flood insurance. The NFIP maps communities in order to establish Flood Risk Zones or Special Flood Hazards Areas. These hazard areas are then mapped on the Flood Insurance Rate Maps (FIRMS). FIRMS are used to assess the risks of floods and aid in proper floodplain management. An update of the flood maps of Lamar County began in FY2006. These maps are not yet complete and therefore were not available for use in this plan. Currently, the county and all of the jurisdictions are participants in the NFIP program.

Regulations

The National Pollutant Discharge Elimination System (NPDES) requires cities to obtain a NPDES permit for the discharge of wastewater/storm water. This program will address residential and commercial land uses, illicit discharges and improper disposal, industrial facilities, and construction sites. Currently, the Cities of Sulligent and Vernon have storm water management plans. Zoning Ordinances in the Town of Millport and the City of Vernon address land use regulations pertaining to hazard mitigation. These ordinances prohibit construction in the floodplains. Subdivision Regulations have been adopted by the Town of Millport, Town of Kennedy and the City of Vernon. Standard Building Codes have been adopted by the City Of Vernon. Additionally, Lamar County and each jurisdiction have various plans and regulatory tools in place to aid in hazard mitigation as shown earlier in the plan in Table 1 -1.

TABLE 3-4
Lamar County NFIP/Flood Map Status
FEMA Flood Map Effective FIRM

Local Government	NFIP Status	Update Status	Date	Action
Lamar County	Participating	Began FY 2006	May 2010	
Town of Beaverton	Participating			
Town of Detroit	Participating			
Town of Kennedy	Participating			
Town of Millport	Participating			
City of Sulligent	Participating			
City of Vernon	Participating			

Source: National Flood Insurance Program ADECA office of Water Resources Participating Jurisdictions

Repetitive Loss Properties

Repetitive loss properties are those for which two or more losses of at least \$1,000 each have been paid under the National Flood Insurance Program (NFIP) within any 10-year period since 1978. FEMA-Local Multi-Hazard Mitigation Planning Guidance, July 1, 2008.

Lamar County has had only one repetitive loss property located in the City of Sulligent in the downtown area. The property, a nonresidential structure, experienced two flood events and damages were restricted to the contents of the building only. The total losses paid were \$ 7,394.75. The City of Sulligent mitigated this problem with grading and fill.

Flood Prone Areas

Lamar County has a high number of rural roads and bridges that are vulnerable to flooding during periods of excessive rain. These roads are located throughout the entire county and are not limited to any concentrated area. There are many major creeks in the county including the Luxapallila, Sipsey, Yellow, Hells, and Buttahatchee creeks.

VI. Drought/Extreme Heat Profile

Drought occurs when there is a deficiency of precipitation over an extended period of time. Climatic factors, such as high temperature, high winds, and low relative humidity, can contribute to the severity of a drought. No society is immune to the social, economic, and environmental impacts of a drought. There are two primary types of drought: meteorological and hydrological droughts. These events can result in agricultural and socioeconomic droughts.

Meteorological droughts are defined as the degree of dryness as compared to the normal precipitation for the area over the duration of the dry season. This type of drought is specific to a given region since atmospheric conditions and precipitation vary from one region to the next.

Hydrological droughts are associated with the effects of precipitation deficiencies on surface or groundwater supplies. Hydrological droughts do not occur as often as meteorological or agricultural droughts. It takes longer for precipitation deficiencies to show up in soil moisture, stream flow, groundwater levels, and reservoir levels. Hydrological droughts have an immediate impact on crop production, but reservoirs may not be affected for several months. Climate, changes in land use, land degradation, and the construction of dams can have adverse effects on the hydrological system especially in drought conditions.

Agricultural droughts occur when the moisture in the soil no longer meets the needs of the crop

Socioeconomic droughts occur when physical water shortage begins to affect people and their quality of life.

The National Weather Service uses two indexes to categorize drought. The most accurate index of short-term drought is the Crop Moisture Index (CMI). This index is effective in determining short-term dryness or wetness affecting agriculture. The most accurate index of long-term drought is the Palmer Index (PI). It has become the semi-official index of drought.

Previous Occurrences. The National Center for Environmental Information reported 18 instances of drought for Lamar County. No crop or property damages were reported. Statewide, 31 counties were declared a disaster area in 2006. Alabama farmers received one million dollars in federal disaster aid along with other grant assistance. It was during this time that the State implemented its Drought Monitoring System. An initial five wells were selected to track water levels around the state, with plans to increase the number of monitoring wells to 25. Drought conditions continued to escalate into 2007 and by August the Federal Government declared all 67 Alabama counties Natural Disaster areas. West-central Alabama reported a rainfall deficit that reached nearly 30 inches by 2007. Impacts were felt by farmers of all crops, including timber, livestock producers, and the forestry service. Additionally; electricity providers were affected as river and lake levels dropped and some municipalities were forced to place restrictions on water consumption as supplies became strained. State Agriculture Commissioner Ron Sparks referred to this event as the worst drought in 30-40 years.

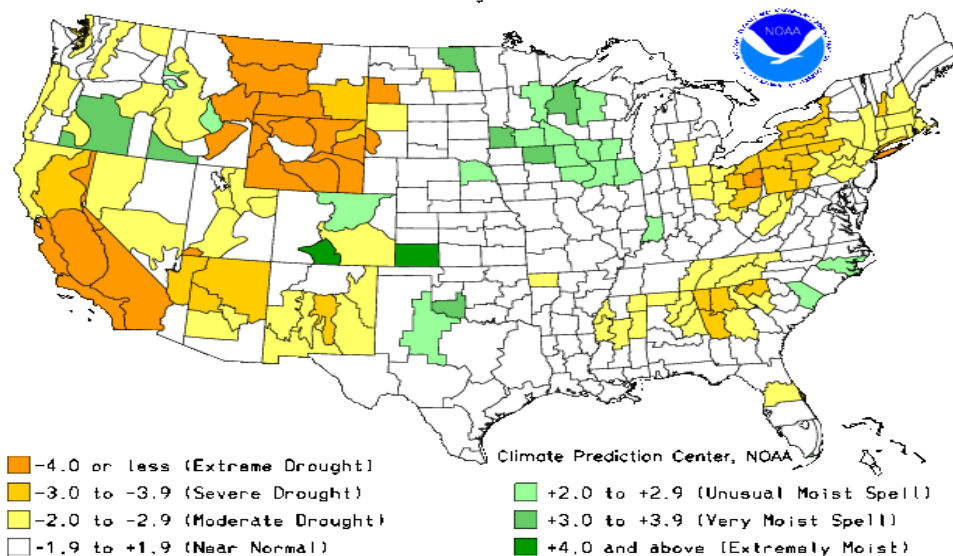
Drought

January 1, 2004 - December 31, 2015

Year	Number of Events	Property Damage	Crop Damage	Comments
2004-2005	0	0	0	
2006	3	0	0	D-2, D-2, D-3
2007	9	0	0	
2008	4	0	0	
2009-2011	0	0	0	
2012	2	0	0	
2013-2015	0	0	0	
Totals	18	0	0	

Source: National Center for Environmental Information

Drought Severity Index by Division
Weekly Value for Period Ending JUL 23, 2016
Long Term Palmer



Extreme Heat
January 1, 2004 - December 31, 2015

80°F -90°F	Fatigue possible with prolonged exposure and physical activity
90°F -105°F	Sunstroke, heat cramps with prolonged exposure
105°F -120°F	Sunstroke, heat cramps, and heat exhaustion likely and heatstroke possible with prolonged physical activity
120°F or Higher	Heatstroke/Sunstroke; exposure for people in higher risk groups

Year	Number of Events	Property Damage	Crop Damage	Comments
2004-2006	0	0	0	
2007	1	0	0	
2008-2011	0	0	0	
2012	4	0	0	
2013-2015	0	0	0	
Totals	5	0	0	

Source: National Center for Environmental Information

Location: Effects of Drought can be experienced in all parts of Lamar County.

Extent. Lamar County experienced 18 Drought events and 5 Extreme Heat events in an 11 year period resulting in a 2.5% probability that a Drought event will occur on an annual basis. The study period from January 1, 2004 - January 1, 2016 (4,384 days) shows there were 16 days the drought events and 5 days the extreme heat effected Lamar County. No property damage was reported. Extreme heat is considered to be a temperature of 102 or higher with a heat index of greater than 106. The drought events that were recorded were statewide and not confined to Lamar County.

Primary effects from Drought and Excessive Heat in Lamar County would include:

1. Crop and other agricultural damage
2. Water supply shortage. Water wells, creeks, rivers, and lakes dry up
3. Forest fires
4. Heat exhaustion and heat stroke

Hazardous results from significant Drought and Excessive Heat in Lamar County would include:

1. Agricultural damage from drought will result in economic losses of crops and livestock.
2. A water supply shortage will result in the necessity for water to be trucked into the area, damage to the sewer system and lack of hydroelectric power.
- 3 - Forest fires can devastate vast acreages and burn homes and businesses.
4. Heat exhaustion can be debilitating and result in a hospital stay. Heat stroke can cause death.

VII. Winter Storms/ Extreme Cold Temperatures Profile

A winter storm is an event in which the varieties of precipitation are formed that only occur at low temperatures, such as snow or sleet, or a rainstorm where ground temperatures are low enough to allow ice to form(i.e. freezing rain). Lamar County is vulnerable to extreme winter weather conditions, such as extreme cold temperatures, snow, and ice.

Previous occurrences. Lamar County has experienced 6 winter weather events 2004 and 2015. There were no reported damages. The most common impacts of severe winter weather are power failure due to downed power lines and traffic hazards. Also many homes and buildings, especially in rural areas, lack proper insulation or heating leading to risk of hypothermia.

**Winter Strom/ Winter Weather
January 1, 2004 - December 31, 2015**

Year	Number of Events	Property Damage	Crop Damage	Comments
2004	0	0	0	
2005	0	0	0	
2006	1	0	0	
2007	0	0	0	
2008	0	0	0	
2009	0	0	0	
2010	1	0	0	
2011	1	0	0	
2012	0	0	0	
2013	0	0	0	
2014	2	0	0	
2015	1	0	0	
Totals	6	0	0	

Source: National Center for Environmental Information

Wind Chill Temperature Table

Wind Speed (mph) ↓	Air Temperature (°F)																	
	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
0	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95

LITTLE DANGER

INCREASED DANGER

GREAT DANGER

RISK OF FROSTBITE (see times on chart below)

GREEN LITTLE DANGER (frostbite occurs in >2 hours in dry, exposed skin)
 YELLOW INCREASED DANGER (frostbite could occur in 45 minutes or less in dry, exposed skin)
 RED GREAT DANGER (frostbite could occur in 5 minutes or less in dry, exposed skin)

Wind Chill Category

Work Intensity	Little Danger	Increased Danger	Great Danger
High Digging foxhole, running, marching with rucksack, making or breaking bivouac	Increased surveillance by small unit leaders; Black gloves optional - mandatory below 0°F (-18°C);	ECWCS or equivalent; Mittens with liners; No facial camouflage; Exposed skin covered and kept dry; Rest in warm, sheltered area; Vapor barrier boots below 0°F (-18°C) Provide warming facilities	Postpone non-essential training; Essential tasks only with <15 minute exposure; Work groups of no less than 2; Cover all exposed skin, Provide warming facilities
Low Walking, marching without rucksack, drill and ceremony	Increased surveillance; Cover exposed flesh when possible; Mittens with liner and no facial camouflage below 10°F (-12°C); Full head cover below 0°F (-18°C). Keep skin dry - especially around nose and mouth.	Restrict Non-essential training; 30-40 minute work cycles with frequent supervisory surveillance for essential tasks. See above.	Cancel Outdoor Training
Sedentary Sentry duty, eating, resting, sleeping, clerical work	See above; Full head cover and no facial camouflage below 10°F (-12°C); Cold-weather boots (VB) below 0°F (-18°C); Shorten duty cycles; Provide warming facilities	Postpone non-essential training; 15-20 minute work cycles for essential tasks; Work groups of no less than 2 personnel; No exposed skin	Cancel Outdoor Training

These guidelines are generalized for worldwide use. Commanders of units with extensive extreme cold-weather training and specialized equipment may opt to use less conservative guidelines.

Source: USARIEM Technical Note "SUSTAINING HEALTH & PERFORMANCE IN COLD WEATHER OPERATIONS," October 2001

Location: All jurisdictions in Lamar County are effected by winter weather.

Extent. Lamar County experienced 6 winter weather events in an 11 year period resulting in a 1.3% probability that a winter storm/winter weather event will occur on an annual basis. The study period from January 1, 2004 - January 1, 2016 (4,384 days) shows there were 6 days the winter weather events effected Lamar County. No property damage was reported. Winter storm/ winter weather would include extreme temperatures below freezing with any accumulation of snow or ice greater than 1/4 inch. Lamar County has experienced 7 degrees (Fahrenheit) above zero in January of 2014. The Extent can be expected be Zero Degrees (Fahrenheit).

Primary effects from winter storms in Lamar County would include:

1. Injury and damage from downed trees and utility lines due to the snow and ice load.
2. Widespread impassable roads and bridges.
3. Disruption of services and response capabilities.

4. Crop and other agricultural damage.

Hazardous results from winter storms in Lamar County would include:

1. Loss of power, communications, and fires are a common result of severe winter storms. Widespread power outages close down businesses and impact hospitals, nursing homes, and adult and child care facilities serving special needs populations.
2. Loss of transportation ability will affect emergency response, recovery and supply of food and materials.
3. Numerous vehicle accidents in a winter Storm can stretch thin the resources of fire rescue and law enforcement.
4. Stranded motorists and the homeless can create a food and housing shortage within the community.
5. The widespread nature of winter storms usually creates a strain on police, fire and medical providers due to the volume of calls for service.

V III. Hurricane/Tropical Storm Profile

Hurricane season in the northern Atlantic Ocean, which affects the United States, begins on June 1 and ends on November 31. These months accompany warmer sea surface temperatures, which is a required element to produce the necessary environment for tropical cyclone\hurricane development. According to data from the National Oceanic and Atmospheric Administration's National Hurricane Center, there are three classification levels of storms based on wind speed. The first, a tropical depression, is an organized system of clouds and thunderstorms with a defined surface cyclonic closed circulation and maximum sustained winds of 38 mph or less. A tropical storm is the second level and is described as "an organized system of strong thunderstorms with a defined surface circulation and maximum sustained winds of 39-73 mph." A "hurricane," which is the third classification level, is "an intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph or higher." Individual hurricanes vary in intensity and are categorized using the Saffir-Simpson Hurricane Scale.

NOAA measures wind speeds for thunderstorm/wind and hurricane events in knots (kts) while the Saffir-Simpson scale, shown later in the Hurricane profile, measures wind speed in miles per hour. Both knots and miles per hour is a speed measured by a number of units of distance covered in certain amount of time. Here is how knots compare to mph. 1 knot = 1 nautical mile per hour = 6076.12 feet per hour
1 mph = 1 mile per hour = 5280 feet per hour

To convert knots into miles per hour, multiply the number of knots by 1.151.

Saffir-Simpson Hurricane Scale

Once a tropical storm reaches the level of a hurricane, it is then classified by the storm's intensity. Intensity levels, or categories, are used to assign a number (e.g., Category 1) to a hurricane based on the storm's intensity at the current time. The Saffir-Simpson Hurricane Scale has a total of five categories. Wind speed is the primary determining factor of where on the scale an individual storm will fall. The categories are a means to anticipate what impacts and damage any particular Storm will inflict upon the location affected by it. With the scale in place; people within the hurricane's tract can better estimate the type of damage they should expect (i.e., wind, storm surge, and/or flooding impacts) due to the intensity of the oncoming hurricane.

Category One Hurricane

- Wind speeds: 74-95 mph: storm surge 4-5 Feet above normal sea levels
- No real damage to building structures; possible damage to poorly constructed signs
- Damages primarily to unanchored mobile homes, exposed shrubbery, and weaker trees
- Coastal road flooding and minor pier damage likely
-

Category Two Hurricane

- Wind speeds: 96-110 mph; Storm surge 6-8 feet above normal sea levels
- Buildings experience damage to roofing material, doors, and windows
- Shrubby and trees experience considerable damage; some trees blown down
- Mobile homes, poorly constructed signs, and piers considerably damaged
- Coastal & low-lying escape routes flood 2-4 hours prior to arrival of hurricane eye
- Smaller boats in unprotected anchorages will break their moorings

Category Three Hurricane

- Wind speeds- 11-130 mph; storm surge 9-12 feet above normal levels
- Structural damage to small residences and utility buildings, minor containment wall failures
- Damage to shrubbery and trees with foliage blown off trees and large trees blown down
- Mobile homes and poorly constructed signs destroyed
- Low-lying escape routes flood 3-5 hours before arrival or eye of hurricane
- Small structures near coastline flooded; floating debris batters larger structures
- Terrain lower than 5 feet above mean sea level may be flooded inland 8 miles or more
- Evacuation of low-lying residents within several blocks of the shoreline may be required.

Category Four Hurricane

- Wind speeds: 131-155 mph; storm surge 13-18 feet above normal
- Extensive curtain wall failures; some total roof structure failures on small residences
- Doors and windows of sturdier structures extensively damaged
- Major damage to lower floors of structures near the shore
- Terrain lower than 10 feet above sea level may be flooded requiring massive evacuation of residential areas as far inland as 6 miles.
- Includes damages and flooding at Category Three levels; increasingly severe

Category Five Hurricane

- Wind speeds greater than 155 mph; storm surge greater than 18 feet above normal levels
- Complete roof failure on many residences and industrial buildings
- Some complete building failures; small utility buildings being blown over or away
- Includes damages and flooding at Category Four levels; increasingly severe
- Severe and extensive window and door damage is anticipated
- Major damage to lower floors of all structures less than 15 feet above sea level and within 500 yards of shoreline
- Massive evacuation of residential areas on low ground within 5-10 miles of shoreline

Threats Related to Hurricanes

Hurricanes impact regions in a variety of ways. The intensity of the storm, the speed of the winds, whether the storm moves through a region quickly or whether it stalls over one area all are variables toward the physical damage the storm will cause. Storm Surges, high winds, and heavy rains are the three primary elements of hurricanes, while tornados and inland flooding are potential secondary elements caused in the wake of the storm. Lamar County is not directly affected by storm surges, therefore no additional analysis will be completed on the topic.

Previous Occurrences. Lamar County received damage resulting from Hurricanes Ivan, Dennis, and Katrina.

**Hurricanes
January 1, 2004 - December 31, 2015**

Year	Number of Events	Property Damage	Crop Damage	Comments
2004	1	0	0	Ivan
2005	2	\$206,106	0	Dennis, Katrina
2006-2015	0	0	0	
Totals	3	\$206,103	0	

Source: National Center for Environmental Information

Location: All jurisdictions in Lamar County experienced effects of the hurricanes.

Extent. Lamar County experienced hurricane events in an 11 year period resulting in a 0.6% probability that a hurricane event will occur on an annual basis. The study period from January 1, 2004 - January 1, 2016 (4,384 days) shows there were 3 days the hurricane events effected Lamar County. In 2005 hurricane Katrina produced \$203,103 in property damage to Lamar County.

Primary Effects of Hurricanes:

I. Storm Surges

- A. Primary cause of deaths in hurricanes
- B. Large volumes of ocean water that are driven Onshore by a land-falling hurricane or tropical storm
- C. Can increase mean water level by 15 feet if accompanied by tide

II. Wind

- A. Secondary cause of deaths related to hurricanes
- B. Continue causing destruction as storm travels miles inland
- C. Able to completely destroy towns and structures that fall within storm path
- D. Winds near perimeter of eye of storm are strongest and most intense
- E. Oftentimes produce tornados

III. Heavy Rains

- a. Rain levels during hurricanes can easily exceed 15 to 20 inches
- b. Cause flooding beyond coastal regions

Secondary Effects of Hurricanes:

I. Tornados

- a. Usually found in right-front quadrant of storm or embedded in rain bands
- b. Some hurricanes capable of producing multiple twisters
- c. Usually not accompanied by hail or numerous lightning strikes
- d. Tornado production can occur for days after the hurricane makes landfall
- e. Can develop at any time of the day or night during landfall of a hurricane

II. Inland Flooding

- a. Statistically responsible for greatest number of fatalities over last 30 years
- b. Stronger storms not necessarily cause of most flooding; weaker storms that move slowly across the landscape can deposit large amounts of rain causing significant flooding

Lamar County is at a low risk for a direct hit by a hurricane due to its position several miles inland from the Alabama coastline. Although Lamar County does not feel the effects of storm surges, other effects including heavy rain, flooding, and tornados often have significant impacts on Lamar County. For example, in 1995 Hurricane Opal made landfall in the Florida Panhandle near Pensacola Beach. Opal then moved across the state of Alabama through Lamar County destroying trees, signs, and power lines with her high winds. Heavy rain fell quickly across the county causing flooding along the banks of creeks and streams.

Hurricane Ivan

Hurricane Ivan impacted southern Alabama from September 13-16, 2004, making landfall near Gulf Shores at approximately 10:00 a.m. on the 16th as a Category 3 hurricane. Storm surge values of 10-14 feet along the Alabama and Florida coastlines were the highest observed in over 100 years. As the storm moved inland, high winds and heavy rains wreaked havoc across the state. Heavy rainfall ranging between five and eight inches caused minor flooding across various areas of the state. Hurricane force winds were experienced for two to four hours across all inland Alabama counties, causing major damage to trees. These fallen trees were determined to be the primary cause of all inland structural damage attributed to the storm and caused electricity to residents to be interrupted for a week or more. Alabama totaled an estimated \$500,000,000 in damage to timber. Most of the soybean and pecan crops were destroyed, while the cotton crop suffered significantly though was not completely ruined. (<http://www4.ncdc.noaa.gov/cgi-wirVwwcgi.dll?wwEvent-storms>) There were no damages reported by local sources for Hurricane Ivan.

Hurricane Dennis

As a Category 3 hurricane, Dennis came ashore at Navarre Beach in the Florida Panhandle around 2:00 p.m. on July 10, 2005. Dennis brought with him sustained wind speed at 135 mph and estimated storm surges of 10-15 feet. The National Weather Service issued an inland hurricane warning, including all seven WARC counties, which indicated areas would experience substantial winds in excess of 74 mph with gusts up to 90 mph. The hurricane produced 5-10 inches of rain throughout Alabama. President Bush approved a disaster declaration to provide infrastructure assistance to governments in counties across Alabama, making them eligible to receive federal and state assistance to recover costs of debris removal operations and emergency protective measures. There were no reported damages from Hurricane Dennis by local sources.

Hurricane Katrina

Hurricane Katrina made landfall on August 29, 2005 near Buras, Louisiana as a Category 3 storm and became known not only as the costliest, but also as one of the most devastating hurricanes in the history of the United States. It is the deadliest hurricane to strike U.S. coastlines since 1928 and produced damages in excess of \$75 billion.

Katrina had maximum sustained winds estimated to be 120 mph at landfall. As Katrina moved across land, the storm weakened, though it maintained hurricane status past Laurel, Mississippi. Southwestern Alabama experienced hurricane conditions as Katrina moved through neighboring Mississippi.

The effects of Katrina were widespread across Alabama, particularly areas in the western portions of the state. These effects included significant rainfall values totaling between 5 and 6 inches near the Mississippi state line and high winds with gusts recorded to be 68 mph out of Vance, Alabama. The rain and winds resulted in thousands of fallen trees and downed power lines. Power outages lasted from a few days to a week or more, and Alabama Power reported Katrina to be the worst storm in their history for statewide damage and power outages. Additionally, minor damage occurred to some structures throughout the area. In Alabama, six tornados also stemmed from Katrina, four of which were F-0 and two that were F- 1.
(<http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent—Show Event--564984>)

Local sources in Lamar County reported a total of \$206,103 in damages as a result of Hurricane Katrina.

IX. Sinkholes,' Expansive Soils Profile

Naturally occurring Sinkholes occur where limestone, carbonate rock, salt beds, or rocks can be dissolved by groundwater circulating through them. As the rock dissolves, spaces and caverns develop underground. The land usually stays intact until the underground spaces become too large to support the ground at the surface. When the ground loses its support it will collapse, forming a sinkhole. Sinkholes can be small or so extreme they consume an automobile or a house. The most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania.

Previous Occurrences: Sinkholes do not pose a threat to Lamar County.

Extent: There have been no reports of sinkholes from any source. Figure 3-3 shows no outcrops of carbonate rocks in Lamar County. Figure 3-4 also shows no active areas of sinkholes or subsidence throughout Lamar County, therefore no further profiling will be done.

Figure 3-3

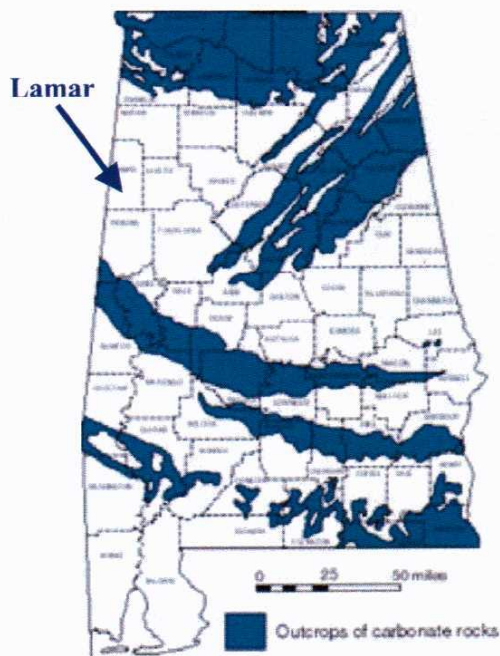
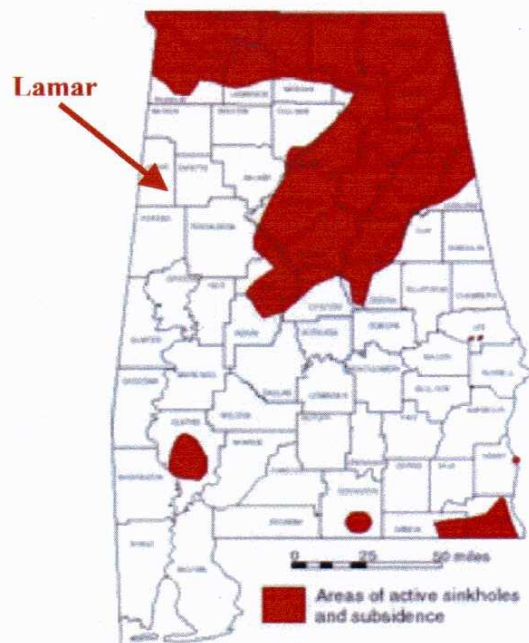


Figure 3-4



Source: <http://www.gsa.al.state>

Expansive soils

Expansive soils are soils that swell when they come in contact with water. The presence of clay is generally the cause of such behavior. Figure 3-5 shows the general soil areas for the state. Lamar County has Coastal Plains, Major Flood Plains and Alluvial soils. There were no expansive soils reported from NOAA or local sources during the time frame covered by the plan. Though these soils have shrink-swell potential, the committee does not feel a profile is necessary.

Figure 3-5: General Soils of Alabama



Source: Cartographic Research Lab, University of Alabama

X. Landslide Profile

A landslide is defined by the United States Geological Survey as the movement of rock, debris, Or earth down a slope. Various natural and man-induced triggers can cause a landslide. Naturally induced landslides occur as a result of weakened rock composition, heavy rain, changes in groundwater levels, and seismic activity. Geologic formations in a given area are key factors when determining landslide susceptibility. The three underlying geologic formations present within the region are the Coker, Gordo, and Tuscaloosa groups. These groups are classified as having low to moderate susceptibility to slope failure.

Location: A 1982 study performed by Karen F. Rheims of the United States Geological Survey indicated that no landslides had occurred in Lamar County.

Extent: Figure 3-6 shows that Lamar County is at a low risk of incidence. Only the northeast corner of Lamar County, including the Town of Beaverton, has a moderate incidence to landslides. There were no landslides reported from NOAA or local sources during the time frame covered by this plan.

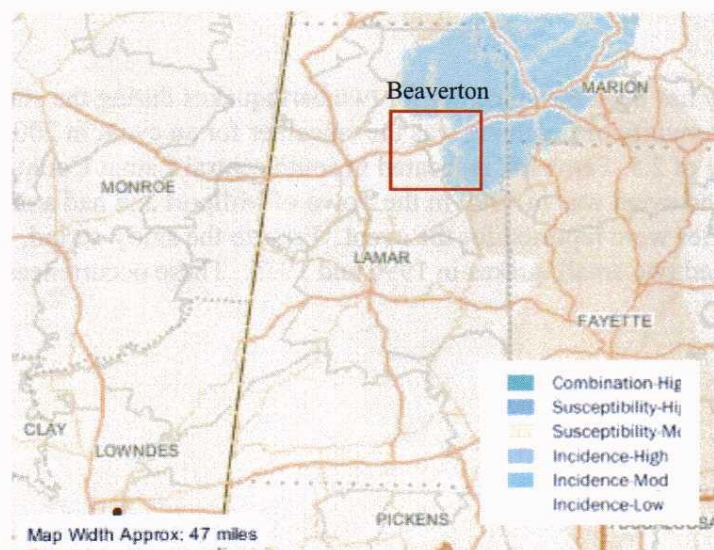
Primary effects from landslide in Lamar County would include:

1. Property damage
2. Impassable roads
3. Sediment erosion
4. Underground infrastructure damage

Hazardous results from landslide in Lamar County would include:

1. Landslides move with tremendous force capable of destroying most structures in its path while carrying anything it comes in contact with.
2. Material from landslides can damage and destroy roads as well as block them with debris, resulting in disruption to business and other activity.
3. Removed sediment can leave the surrounding area bare and prone to erosion.
4. The flow of a landslide can rip underground pipes and wiring from an area as well as bury them deeper under debris, creating a loss of services.

Figure 3-6 Landslide Incidence in Lamar County



Source: <http://www.hazardmaps.gov/savedMapManager.php>

XL Earthquake Profile

An earthquake is a sudden slip on a fault and the resulting ground shaking and radiated seismic energy caused by the slip (<http://i/geology.usgs.gov/index.shtml>). The hazards associated with earthquakes include anything that can affect the lives of humans, including surface faulting, ground shaking, landslides, liquefaction, tectonic deformation, tsunamis, and seiches. Earthquake risk is defined as the probability of damage and loss that would result if an earthquake caused by a particular fault were to occur. Losses depend on several factors including the nature of building construction, population density, topography and soil conditions, and distance from the epicenter. Interestingly, an earthquake's magnitude can be a poor indicator of hazard impact because the duration of ground shaking, and resulting increased damages, is not factored into the magnitude concept. The majority of losses are due to collapsing houses and other structures, the most vulnerable being those of unreinforced masonry and adobe. Structures built with more flexible materials, such as steel framing are preferred. Wood frame construction, which constitutes a high percentage of homes in the United States, also tends to flex rather than collapse, but is more susceptible to fire. Building codes have historically been utilized to address construction standards to mitigate damages for earthquakes and other hazards. However, older structures, non-compliance, and incomplete knowledge of needed measures remain a problem. In order to reduce losses to lives and property, wider adoption of improved construction methods for both residential and important critical facilities such as hospitals, schools, dams, power, water, and sewer utilities is needed.

The 1996 US Geological Survey Shaking-Hazard Map Figure 3-7 shows that earthquakes are a low rated hazard in the state and shows that Lamar County has between a two and four percent probability of an earthquake occurring. These hazard categories are based on the frequency that earthquakes occur and the distance the earthquake can be felt from the epicenter. The colors depict the levels of horizontal shaking that have a 1-in-10 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of g, the gravitational acceleration of a falling object.

Although many areas of the United States are better known for their susceptibility, earthquakes do occur in Alabama. Figure 3-8 shows the epicenters of earthquakes recorded in the state since 1886 as provided by the Geological Survey of Alabama. Those events that occurred in Lamar County during the study period of January 1999 — September 2015 are noted below.

Previous occurrences. Lamar County has been the epicenter for two earthquakes during the study period. The unincorporated community of Fernbank was the epicenter for an event in 2005 that had a recorded magnitude of 2.5. Fernbank is located in south central Lamar County just northwest of Millport. The second event was in 1999 in the Town of Millport and had a magnitude of 2.0. No damage or injuries were reported for the event. Prior to the study period, the Town of Kennedy experienced two small quakes in 1990 and 1975. These occurrences had negligible effects on the area.

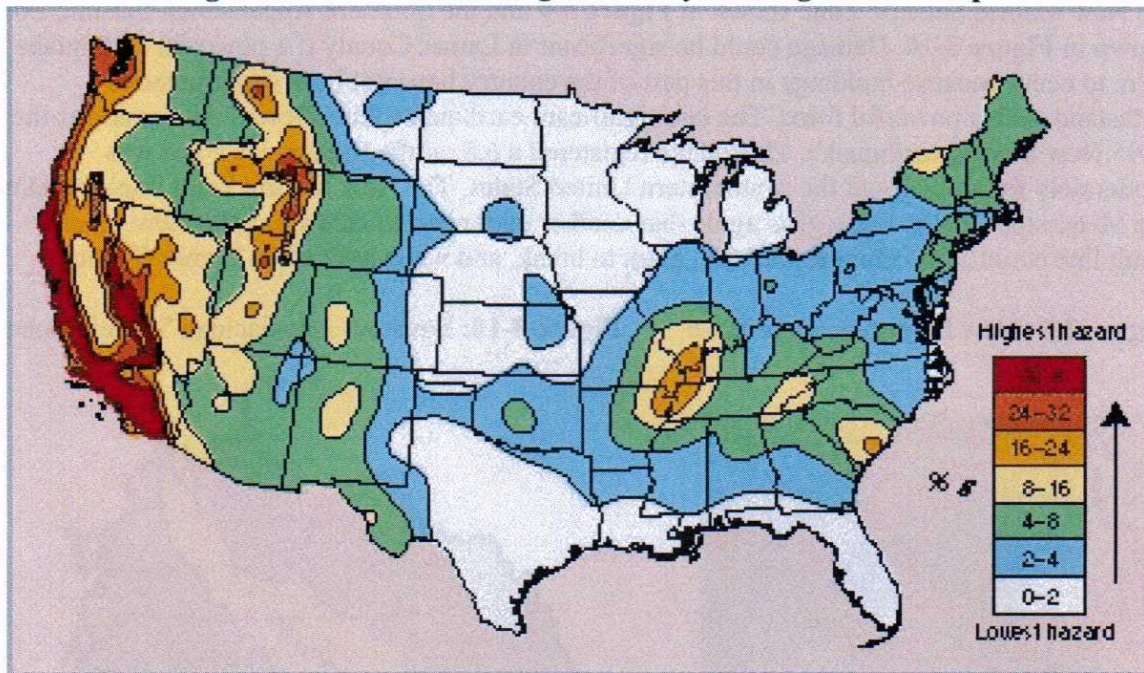
Earthquakes				
January 1, 2004 - December 31, 2015				
Year	Number of Events	Property Damage	Crop Damage	Comments
1999	1	0	0	
2005	1	0	0	2.5
Totals	2	0	0	

Source: National Climatic Data Center

Location: Lamar County has experienced earthquakes only in the south part of the county and had no damages from the events.

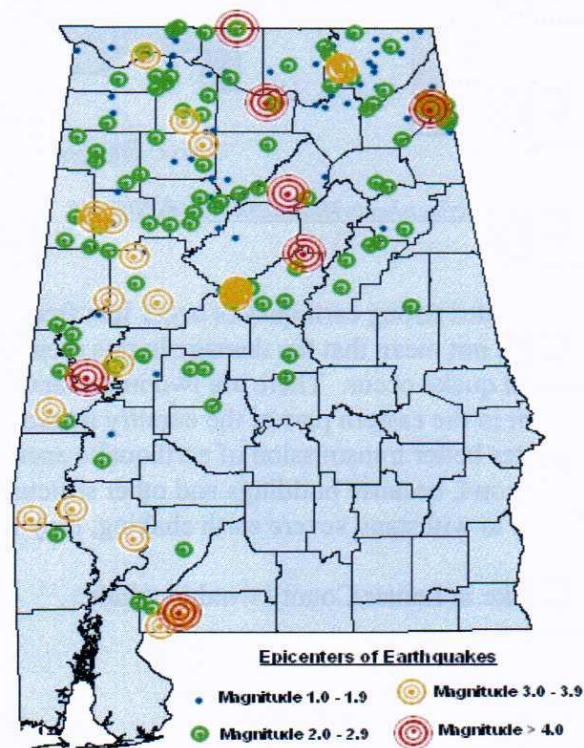
Extent: The risk of a significant, damage causing earthquake in Lamar County is low, with the strongest magnitude expected to be 2.5.

Figure 3-7: 1996 U.S. Geological Survey Shaking-Hazard Map



Source: Geological Survey of Alabama at <http://www.gsa.state.al.us/gsa/EQ2/eg.html>

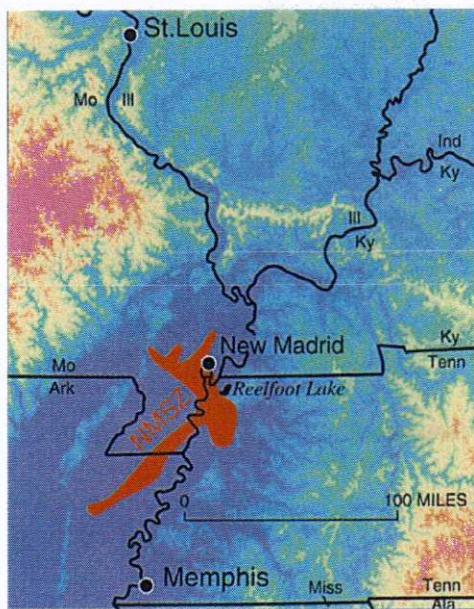
Figure 3-8 Epicenters of Earthquakes



Source: Geological Survey of Alabama at <http://www.gsa.state.al.us/gsa/geologic hazards/earthquakes/eqinal.html>

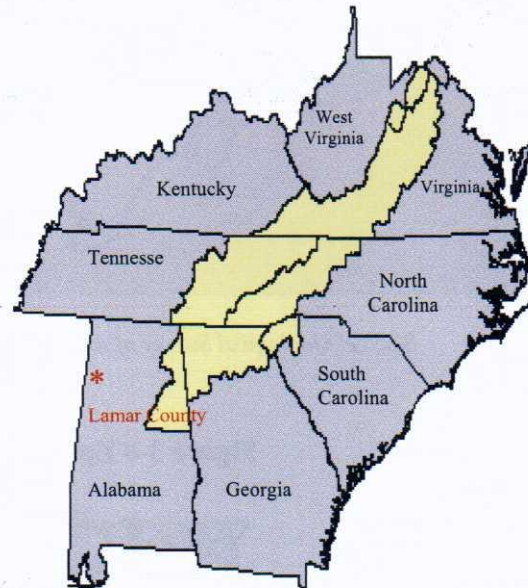
Two zones of frequent earthquake activity that could potentially impact Lamar County are the New Madrid Seismic Zone shown in Figure 3-9 and the Southern Appalachian Seismic Zone shown in Figure 3-10. Damage could be significant in Lamar County if a powerful earthquake were to occur because buildings in this part of the country have not been constructed to withstand such a powerful force. The last significant earthquake that affected Alabama was the 1895 New Madrid earthquake. This quake registered a 6.8 on the Richter scale and was moderately felt throughout the southeastern United States. The New Madrid Fault line runs along the Mississippi River. Geologists agree that another major earthquake along the New Madrid Fault line could cause chimneys to fall, glass to break, and walls to crack in Lamar County.

Figure 3-9: New Madrid Seismic Zone



Source: <http://quake.wr.usgs.gov/prepare/factsheets/HiddenHazs/NMSZBig.gif>

Figure 3-10: Southern Appalachian Seismic Zone



Source: <http://samab.org/data/SAACD.html>

In the eastern United States strong earthquakes occur less frequently than other parts of the country; however, this does not mean that the damage in this area would be any less catastrophic should a powerful quake occur. There are two important reasons for this the first is that the type of rock present in the eastern part of the country transmits seismic waves more effectively. This in turn creates better transmission of earthquake energy and results in higher damage over a wider area. Second, because buildings and other structures in the eastern United States have not been designed to withstand severe earth shaking, they will sustain more damage.

Primary effects from earthquake in Lamar County would include:

1. Property Damage
2. Underground infrastructure damage
3. Building collapse
4. Trigger for other natural disasters

Hazardous results from earthquake in Lamar County would include:

1. Shaking can cause cracking of roads, bridges, or buildings, which may also lead to collapse.
2. Pipes and wiring underground could be severely damaged due to the movement of the earth. This would result in interruption of service and long periods of repair before lines were serviceable again.
3. Buildings in Lamar County are not built to meet the rigors of earthquakes; collapsing structures could kill or injure occupants.
4. Earthquakes can create other disasters such as landslides, flooding, and sinkholes. Shifting of underlying soil and breaching of dams are examples of possible results from an earthquake.

XII. Wildfire Profile

Wildfires are responsible for burning thousands of acres of land across the United States each year. They are large, fast moving, disastrous fires that occur in the wilderness or rural areas. These fires are uncontrolled and in dry conditions can spread rapidly through the surrounding vegetation and structures. Lamar County is susceptible to wildland fires especially during times of drought. Lamar County has a total of 314,600 acres of forestland.

Wildfires

January 1, 2004 - December 31, 2015

Location	Date	Cause of Fire	Acres	Deaths	Injuries	Property	Crop
Lamar County	2004	None >10 acres	0				
Lamar County	01/25/2005	Miscellaneous	29				
Lamar County	04/18/2005	Smoking	12				
Lamar County	03/04/2006	Debris Burning	18				
Lamar County	04/11/2006	Incendiary	16				
Beaverton	06/17/2006	Campfires	10				
Detroit	07/15/2006	Debris Burning	67				
Detroit	08/18/2006	Smoking	12				
Beaverton	10/12/2006	Smoking	19				
Lamar County	3/7/2007	Debris Burning	12				
Lamar County	3/15/2007	Incendiary	13				
Lamar County	3/18/2007	Incendiary	14				
Lamar County	3/21/2007	Debris Burning	10				
Lamar County	3/21/2007	Debris Burning	30				
Lamar County	4/8/2007	Debris Burning	14				
Lamar County	1/3/2008	Debris Burning	10				
Lamar County	3/13/2008	Debris Burning	24				
Lamar County	3/22/2008	Incendiary	20				
Lamar County	2009	None >10 acres	0				
Lamar County	3/30/2010	Arson	10				
Lamar County	7/31/2010	Equipment	25				
Lamar County	9/8/2010	Arson	31				
Lamar County	9/24/2010	Miscellaneous	11				
Detroit	10/9/2010	Arson	23				
Kennedy	2/14/2011	Escape Prescribe	20				
Lamar County	12/4/2011	Debris Burning	40				
Lamar County	1/3/2012	Arson	34				
Beaverton	2/26/2012	Unknown	12				
Millport	3/19/2012	Railroad	93				
Lamar County	3/20/2012	Debris Burning	12				
Lamar County	11/26/2012	Arson	60				
Lamar County	12/15/2012	Miscellaneous	10				
Sulligent	3/20/2013	Power lines	75				
Lamar County	3/14/2014	Structure Fire Escape	35				
Lamar County	6/18/2014	Lightning	88				
Lamar County	8/23/2014	Debris Burning	15				
Millport	7/22/2015	Unknown	27				
Totals	35		951	0	0	\$0	\$0

Source: Alabama Forestry Commission

This table shows the number of wildfires reported in Lamar County by the Alabama Forestry Commission and the National Forest Service. For the purpose of this report a wildfire was defined as a fire affecting 10 acres or more. During the reporting period there have actually been 286 wildfires in Lamar County that burned a total of 1408 acres.

The National Forest Service (NFS) maintains data nationwide and produces various maps and forecasts daily under the Wildland Fire Assessment System (WFAS). A review of this data showed Lamar County has an 11-15 percent probability of a fire occurring because of a lightning strike. The probability of ignition by lightning depends mainly on fuel moisture. Fuel Model Maps help to determine susceptibility of vegetative cover to wildfires. Lamar

County is covered by Fuel Models A and C. Areas covered by these models consist of light fuel vegetation such as herbaceous plants and round woods that are less than one-quarter of an inch.

Figure 3-11 and Figure 3-12 from the Alabama Forestry Commission show Lamar County's risk of a wildland fire on a given acre and the fire occurrences per 1,000 acres. The areas at highest risk in Lamar County are along the southwest border of the county line and an area just north of the unincorporated area of Bedford in the east central part of the county. These areas include spots ranked as either "High" and/or "Extreme" on both the fire susceptibility and fire occurrence indexes.

Primary effects from wildfire in Lamar County would include:

1. Loss of property
2. Loss of livestock
3. Destruction of wilderness
4. Crop destruction

Hazardous results from significant wildfire in Lamar County would include:

1. Widespread fire destroys everything flammable, leaving people homeless and businesses destroyed.
2. Fenced in livestock have no way of escaping the path of a wildfire, and most are lost due to smoke inhalation.
3. Most wildfires actually help forests grow because they rid the forest of underbrush, but exceptionally hot fires that have a long duration destroy entire forests.
4. An entire year's crop can be lost by burning through all vegetation.

Figure 3-11

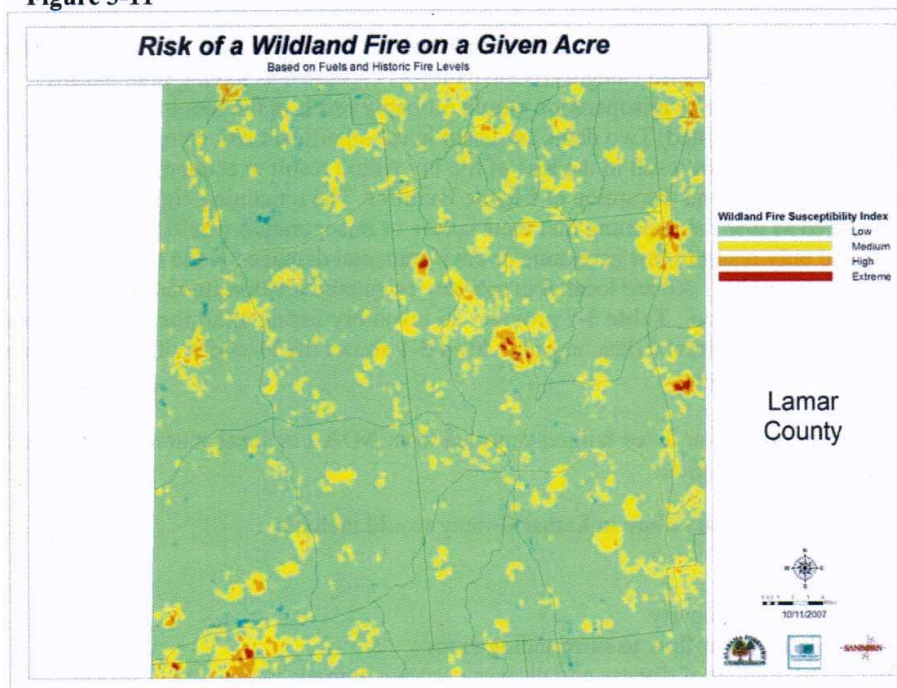
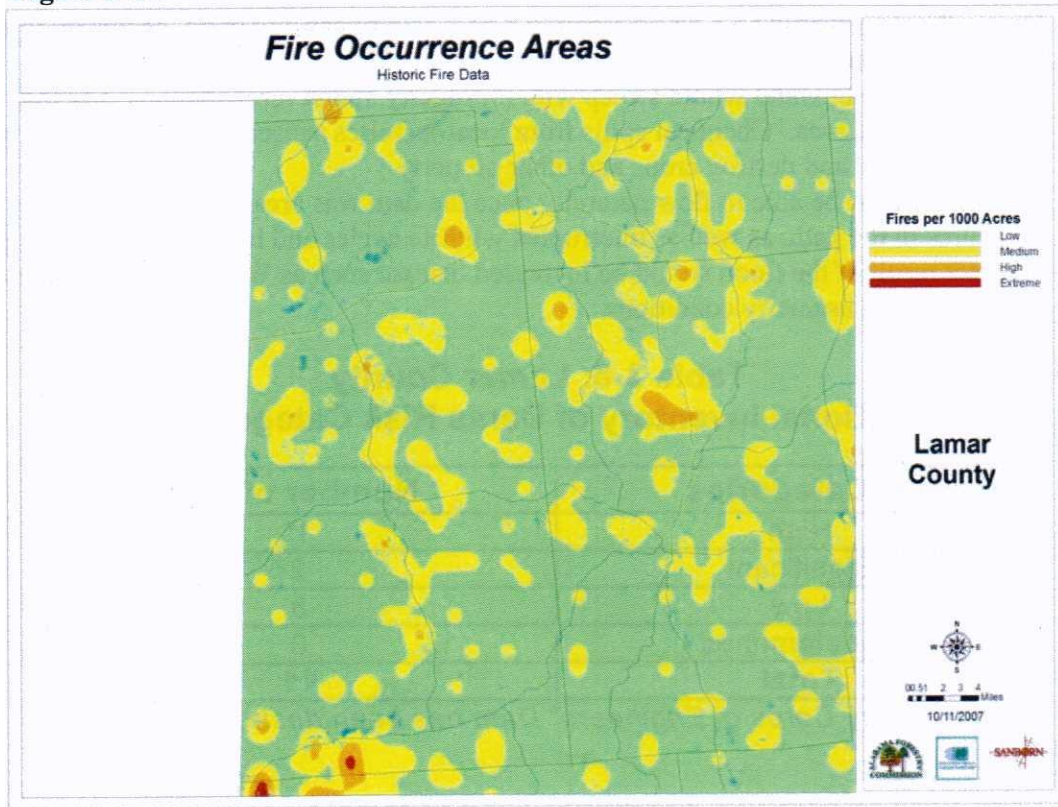


Figure 3-12



XIII. Dam Failure Profile

The National Inventory of Dams lists eleven dams in Lamar County. Table 3-6 lists the number of dams in each hazard category. One dam was classified as having high hazard potential, meaning failure or disoperation would probably result in the loss of human life. This dam has since been mitigated. Two dams are listed in the significant risk category meaning their failure would probably not result in the loss of life but would result in economic loss, environmental damage, and disruption of lifeline facilities. The remaining eight dams in the county are listed as low risk meaning that their failure or disoperation would not result in the loss of life and only result in low economic or environmental damage. None of the dams is located in a municipality. All are located in sparsely populated areas scattered throughout the unincorporated jurisdiction. Table 3-7 provides an inventory listing of all the dams in Lamar County and includes additional data on each. Map 3-1 shows the locations of these dams and their associated risk category.

Previous Occurrences. There were no dam or levee failures reported from NOAA or local sources during the time frame considered by this plan.

Extent: The risk of a dam failure in Lamar County is low.

Primary effects from Dam failure in Lamar County would include:

1. Loss of life
2. Destruction of property
3. Unregulated water flow to surrounding areas.
4. Increased amount of disease and disease-carrying animals in the area.

Hazardous results from dam failure in Lamar County would include:

1. Heavy flooding would be a direct result of a dam failure causing many deaths by injuring and trapping people in structures.
2. Large amounts of water would sweep with it property and severely damage any that remained in the area. Chemical spills from local factories caused by rushing water would pollute the area and destroy crops and other property.
3. The river would be able to flow naturally once the dam was breached, damaging any structures in the path, as well as interrupted wildlife cycles and hydrologic power supply.
4. A direct result of the flood would be increased disease such as West Nile and Malaria as a result of the unsanitary conditions.

**Table 3-5: Lamar County
National Inventory of Dams Risk Categories**

Hazard Categories	Number Of Dams
High	*1
Significant	2
Low	8
Undetermined	0
Total	11

Source: Army Corps of Engineers* Dam has been destroyed

Map 3-1: Lamar County
Dam Locations
by Risk Category

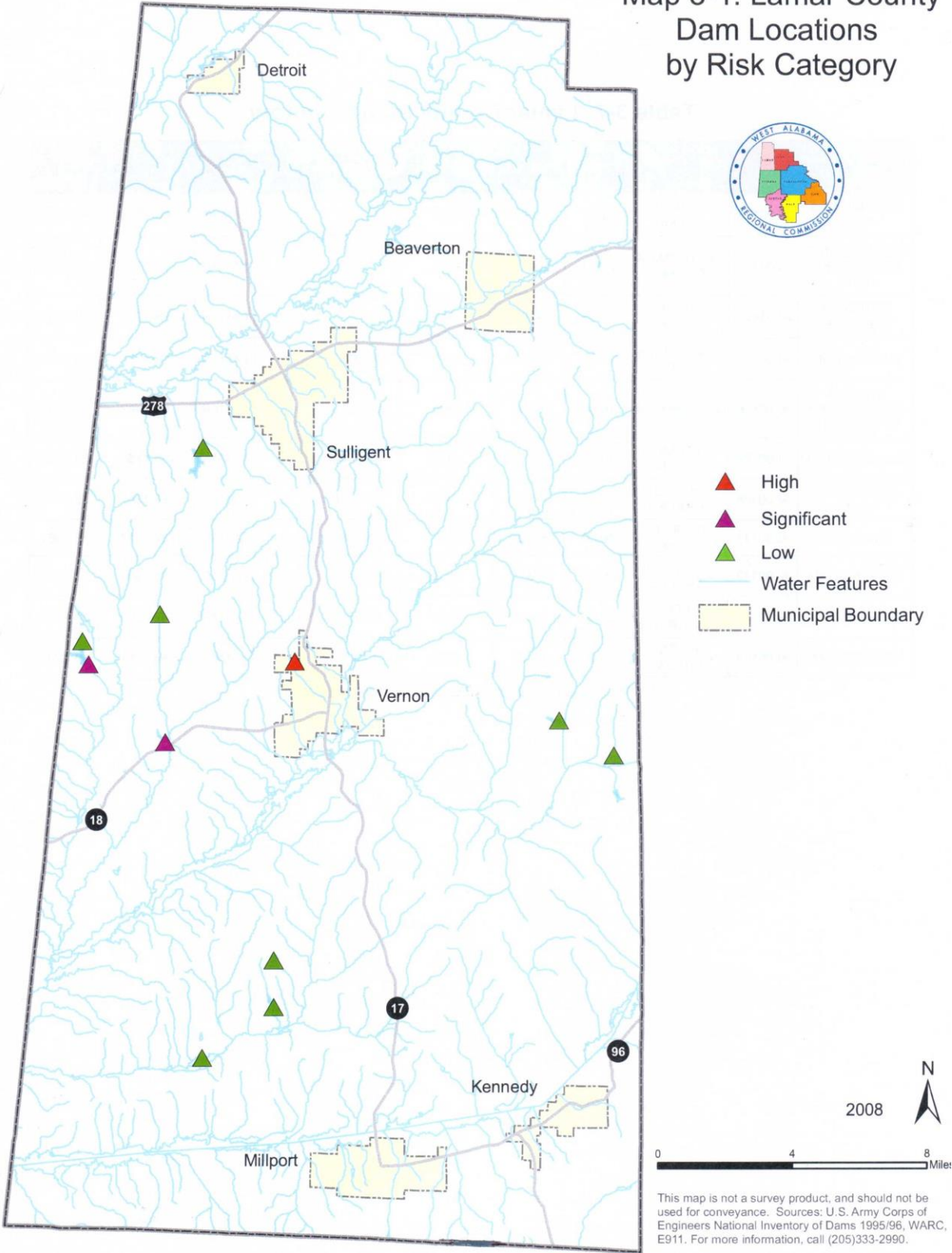


Table 3-6• Lamar County Dam Inventory

Dam Name	ND/ID	River	NID Height	NID Storage	Year Completed	Drainage Area	Hazard	County	Longitude	Latitude
Dolan Davis Dam	AL 00114	Tributary Mud Creek	1500	7000	1960		Low	Lamar	-88.1733	33.608
Lamar County Public	AL 00110	Tributary Cut Bank Creek	2300	50400			Significant	Lamar	-88.2333	33.7750
Faulkner Lake Dam	AL 01478	Tributary Yellow Creek	1800	6400			High	Lamar	-88.1267	33.7767
B. B. Box Dam	AL 00107	Tributary . Cut Bank Creek	2500	46200	1970	019530	Low	Lamar	.88.2367	33.7850
William Phillips Dam @ Bedford	AL 00116	Branch	1800	7800	1969	006250	Low	Lamar	-88.1967	33.7987
Sulligent Lake Dam	AL 00109	Indian Creek	3000	87200	1956	039060	Low	Lamar	-88.1750	33.81583
Gault Lake Dam	AL 00108	Tributary Mud Creek	2000	11600	1950	005470	Low	Lamar	-88.1367	33.6483
Yates Lake Dam	AL 00111	Tributary Hells Creek	3600	38300	1957	054690	Low	Lamar	-87.9617	33.7367
Rogers Lake Dam	AL 00112	Tributary Wilson Creek	2000	17600	1953	023440	Significant	Lamar	-88.1933	33.7417
DuBose Lake Dam	AL 00115	Tributary Browns Mill Creek	2000	7200	1962	008590	Low	Lamar	-87.9900	33.7517
McGee Lake Dam	AL 00113	Tributary Mud Creek	1800	9200	1960	013280	Low	Lamar	-88.1367	33.6283

Source: <http://crunch.tec.army.mil/nidpublic/webpages/nid.cfm>

Lamar County Hazard Probability Assessment

The Hazard Probability Assessment shows the likelihood of a future occurrence based on the number of historical occurrences and population affected by each event. Data are from NOAA, the National Forest Service, the Alabama Forestry Commission, and the Geological Survey of Alabama. The source data was supplemented by the Lamar County EMA and local input to provide the number of historical occurrences and affected population of events of the past 10-year period of 2004-2015. Probability was calculated by dividing the number of occurrences of each hazard type by the number of days (4,384) in the 11 year study period. This provided the probability, or likelihood, that each hazard has of occurring on any given day in Lamar County during the next ten years. There are instances where the probability of a future event for an identified hazard could not be determined due to the absence of historical event data. This is a data limitation beyond the control of an affected jurisdiction.

Table 3-7: Lamar County Hazard Probability Assessment				
Natural Hazard	Number of Historical Occurrences*	Probability of Future Occurrence*	Extent*	Area Affected
Thunderstorm/Wind	135	0.030%	>10%	County-wide
Lightning	3	0.0006%	>10%	County-wide
Hail	57	0.013%	5-10%	County-wide
Tornado	17	0.004%	>10%	County-wide
Flood	54	0.012%	5-10%	County-wide
Drought/Extreme Heat	23	0.005%	>10%	County-wide
Winter Storm	6	0.001%	>10%	County-wide
Hurricane/Tropical Storm	3	0.0006%	5-10%	County-wide
Sinkhole/Expansive Soils	0	0	0	N/A
Landslide	0	0	0	N/A
Earthquake	2	0.0004%	5-10%	County-wide
Wildfire	15	0.006%	5-10%	County-wide
Dam/Levee Failure	0	0	0	N/A
Source; NOAA; Alabama Forestry Commission and National Forestry Service; Participating Jurisdictions; Geological Survey of Alabama				
<p>Methodology: Number Of historical occurrences is events reported by all sources during the 11 year period of January 1, 2004 — December 31, 2015. Probability is expressed as a percentage Of the chance of an event occurring on any day by dividing the number of historical events by 4384 (days in the 11 year period). Extent is expressed as the percentage assigned by the jurisdiction's ranking in the vulnerability summary (Table 4-9)</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the probability, extent, or affected area. 				

Lamar County, Alabama Hazard Mitigation Plan

Section Four: Vulnerability Assessment

In section Three, the primary and hazardous results were considered for each identified hazard. In this section each hazard was further reviewed to identify the impacts on the county and its jurisdictions. Impact in terms of dollar value for past hazard occurrences are shown for Lamar County in section three and for each jurisdiction in their individual Hazard Event table in Section Five of the plan.

Hazard Impacts

Thunderstorms (wind, lightning, and hail)

Thunderstorm damages have a wide range of severity. Falling trees and flying debris are responsible for most of the destruction. Lightning can cause substantial property damage and death. Utility disruption and blocked roadways are also common. Historically Lamar County has experienced these storms every year with varying frequency and intensity. Winds of 65 knots have been recorded during these events. Hailstones as large as 1.75 inches have occurred resulting in property and crop damage. Since these storms have no defined track, all residents of Lamar County are vulnerable to the impacts of severe thunderstorms.

Tornados

The impacts of tornados can be far-reaching. Property damage, injury, and death can result from the weakest tornados. Interruption of electrical services, communications, and other utilities may occur. Transportation corridors may be blocked or even destroyed. Debris removal can take time and can be costly. Residents may suffer from post-traumatic stress disorder, depression, anxiety, and grief for lost loved ones. Limited emergency personnel results in longer response times. Tornados do not follow a definite path; therefore, all residents of Lamar County are vulnerable to tornados. Tornados ranging in intensity of FO to F3 have been recorded in Lamar County.

Areas with higher population densities carry increased potential for damage, Injury and death. The Cities of Sulligent and Vernon, and the Town of Millport have the highest number of residents in the county and would be impacted the most. Areas with high concentrations of mobile homes are also very vulnerable to tornados. Lamar County has 1,807 mobile homes countywide, 24% of the total housing stock. The City of Sulligent has the highest number of mobile homes within a municipality with 192 (18.7%).

Flooding

Flooding can occur along the banks of creeks and streams that flow throughout the County and where development has encroached in the floodplain. Flash flooding can occur anywhere in the County but is most likely in areas with denser development patterns. The Cities of Sulligent and Vernon and the other towns in the county are vulnerable to flash flooding that can occur due to inadequate or clogged drainage systems during periods of excessive rainfall, to date, there have been limited Repetitive Loss properties in Lamar County to indicate any significant impact areas. Impacts for both flood types includes property and crop damage, washed out roadways, contamination or failure of water and sewer systems, increase in waterborne disease, and possible dam or levee failure.

Drought and extreme heat

All of Lamar County is vulnerable to drought and extreme heat occurrences. The effects are far-reaching and impact people, livestock, crops, and hydrologic systems. Droughts create conditions of increased vulnerability to wild fires, which destroy lives and property, and also leads to water supply shortages as reservoirs and groundwater levels drop. Heat exhaustion and stroke are common and can disproportionately impact the elderly and low-income residents who cannot afford air conditioning.

Winter storms and extreme cold

Lamar County has been affected by several winter storms in the past, which have included snow, sleet, ice and extreme temperatures. The entire county along with all jurisdictions have been impacted by these events. Lamar County is not as readily equipped to deal with winter storm events. As a result, ice and snow can leave roads impassable, effectively crippling residents from traveling to school, work, or the grocery store. The most significant impacts from a winter storm event are power outages and consequential loss of heat, numerous transportation-related accidents, and stranded motorists. Much like drought, extreme cold has more impact on disadvantaged populations, especially the homeless.

Hurricanes and Tropical Storms

Lamar County has experienced several Hurricanes/Tropical Storms including Ivan, Dennis, and Katrina. Fallen trees, high winds, and excessive rain were widespread throughout the county. These storms left large numbers of residents without power and tremendous amounts of debris blocking roadways. Like tornados, the impact from these events is most felt by those living in mobile homes in the county and its jurisdictions (24% of the housing stock). Additional impacts include cleanup of debris and the restoration of power and other damaged utilities. The effects of these events are often widespread and not concentrated to an isolated or specific location. Inadequate manpower to deal with the amount of damage often causes delays getting systems back to normal, further impacting residents.

Sinkholes and Expansive Soils

During the Risk Assessment, it was determined that sinkholes and expansive soils were not a significant threat to the county due to the absence of outcrops of carbonate rocks and limited adverse effects and shrink-swell potential of soils in the county. While the County and the Town of Beaverton identified this hazard in the risk assessment there have been no reported events and both jurisdictions ranked this as a very low priority hazard.

Landslides

During the Risk Assessment, it was determined that landslides were not a significant threat to the county due to the absence of any reported occurrences. The County and the Town of Beaverton identified this hazard in the risk assessment. Both jurisdictions ranked this as a very low priority hazard indicating that impacts would not be significant.

Earthquakes

Lamar County has experienced low magnitude earthquake events in the past, primarily in the southern part of the county. No damage or injuries were reported from these events. The impacts from earthquakes would be negligible. Impacts are possible in all jurisdictions. The built environment, including underground infrastructure, is most likely to be affected; however, earthquakes can trigger other natural disasters such as landslides and sinkholes.

Wildfires

Due to the vast amount of forestland in Lamar County, wildfires can impact the entire county and all its municipalities. Wildfires can encroach on homes and developed areas. Smoke from these fires may lead to limited visibility along roadways, increasing the probability of accidents. In addition, wildfires in Lamar County can destroy property, crops and livestock, threatening the economic livelihood of the County.

Dam and levee failure

There are eleven dams located in Lamar County. Only one dam, located in north Vernon, had been classified as having High hazard potential, and it has since been destroyed. While none of the jurisdictions identified this hazard in the risk assessment and there have been no prior historical occurrences, this hazard was profiled due to the possibility of a future occurrence. The impact of a dam failure in the county is low given the dam locations are in remote areas with little residential occupancy. None of the municipalities would be impacted. Areas likely to be affected are unincorporated areas to the southwest of Vernon, northeast of Millport, and near the eastern county line. Potential impacts would be limited or unregulated water flow, associated damages to property and crops, and a potential increase in waterborne disease.

Socially Vulnerable Populations

Certain populations are generally more affected by hazard events. These populations can be defined in terms of social, racial, and economic characteristics. Data provided in the section was obtained from 2014 Census using breakouts for entire municipalities and census tracts.

Table 4-1 shows the county's population characteristics by Jurisdiction and by census tract. Lamar County contains three census tracts (See Map 4-1). Those tracts with the highest population are the most vulnerable. Tract 301 is the most populated tract, which contains the City of Vernon. Tract 300 is the second most populated tract and includes the City of Sulligent and the Towns of Beaverton and Detroit. Tract 302 is the least populated tract and contains the Towns of Kennedy and Millport.

Minority populations are generally considered to be more vulnerable to hazard events. These populations may not have the resources necessary to recover as quickly or completely from disasters. Minorities generally have higher percentages of inadequate medical insurance, inadequate home insurance, and homes that may be deemed as substandard housing.

Populations over sixty-five years of age and those under eighteen years of age are more vulnerable than other population groups. These groups are at higher risk for injury and medical complications that may

occur during or as a result of a disaster. These special needs populations may require more attention during evacuation and may require special shelters.

In addition to the racial and age composition within the county, income levels are important when vulnerable populations. Lower income individuals may not have the resources to prepare or recover from disasters. Table 4-2 shows the median household income, per capita income, and poverty level data for the jurisdictions and census tracts in Lamar County.

The median household income for the State of Alabama is \$43,511. The median household income for the United States is \$53,482. None of the census tracts in the County has a median household income that equals or exceeds the state or national average. Per capita income is the average obtained by dividing aggregate income by the total population of an area. The per capita income for the State of Alabama is \$23,936. The per capita income for the United States is \$28,555. None of the municipalities or census tracts in the County has per capita income that equals or exceeds these averages.

The percent of persons below the poverty level in the State of Alabama is 18.93%. The corresponding rate for the United States is 15.59%. The poverty level in Lamar County is 22.62% which is above both of the other rates.

Table 4-1: Lamar County Population Characteristics

Geographic Area

Location	Population	Race- White	Race- Black	Race- Other	Age 16-64 Years	Age 65 and Over	Under 18 Years
Lamar County Total	14268	12460	1659	149	8195	2731	3342
Beaverton	201	191	10	0	115	50	36
Detroit	237	197	33	7	128	43	66
Kennedy	447	373	64	10	236	107	104
Millport	1049	679	353	17	587	189	273
Sulligent	1927	1509	371	47	1077	362	488
Vernon	2000	1587	361	52	1115	315	570
Unincorporated Area*	8407	7924	467	16	4937	1665	1805

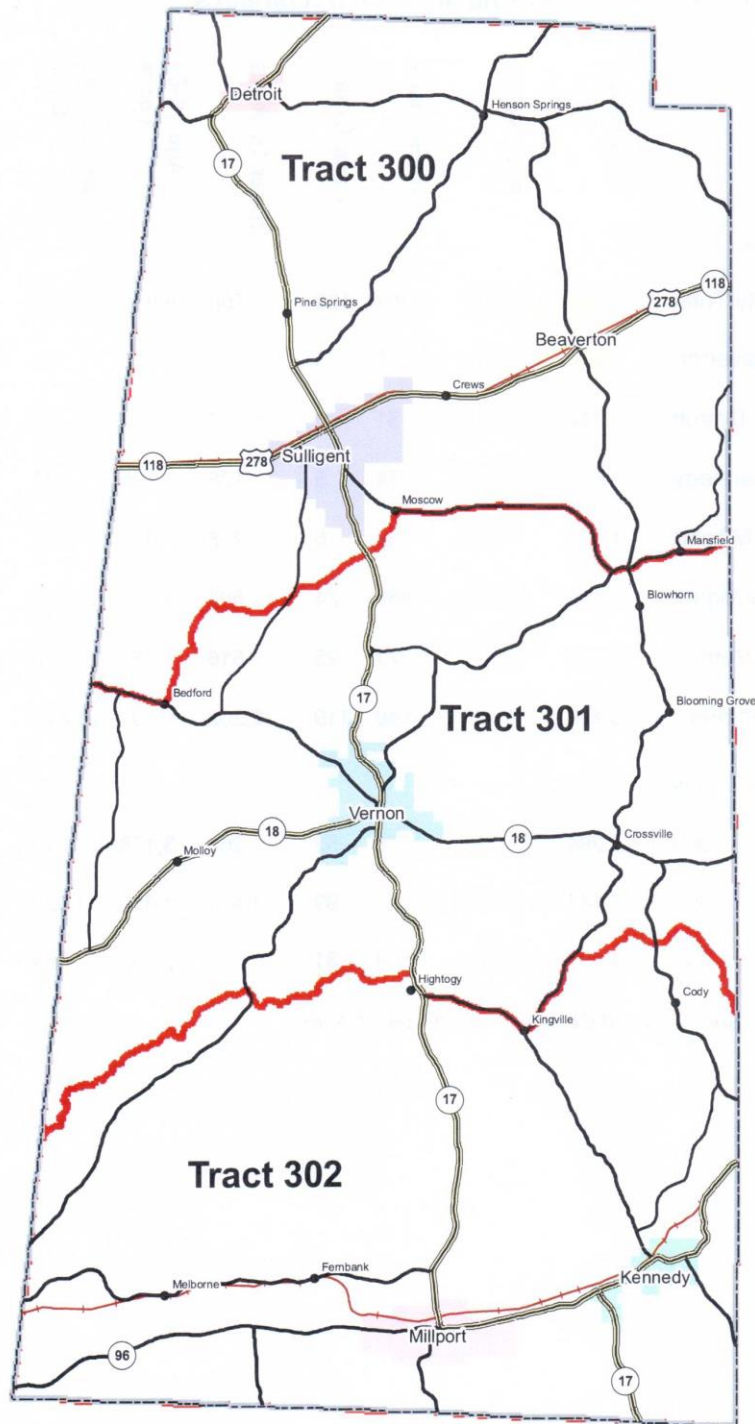
Source: As of July 1, 2014 <http://www.census.gov/quickfacts>

Census Tracts

Tract Number	Population	Race- Percent White	Race- Percent Black	Race- Percent Other	Population Density per Square Mile	Housing Units	Median Household Income
300	4,689	86.6 %	11.3 %	2.1 %	21.54	2,380	\$ 37,439
301	5,713	86.6 %	11 %	2.4 %	29.96	2,836	\$ 35,318
302	4,162	86.6 %	11.5 %	1.9 %	21.12	2,138	\$ 36,449

Source: www.usa.com census tracts

Map 4-1: Lamar County Census Tracts



This map was produced by the West Alabama Regional Commission, (205) 333-2990.
 Source: US Census Bureau, Census 2000, TIGER line files.
 This map is not a survey product and should not be used for conveyance.
 Ainfo/Lamar/Tiger/2000sp/LCttrblkgp Nov 2008

Table 4-2: Lamar County Income Data**Geographic Area**

Location	Median Household Income	Per Capita Income	Percent Below Poverty Level
Lamar County	\$ 36,021	\$ 19,094	22.62%
Beaverton	\$ 20,250		
Detroit	\$ 19,531		
Kennedy	\$ 24,750		
Millport	\$ 26,458		
Sulligent	\$ 26,541		
Vernon	\$ 27,344		

Source: As of July 1, 2014 <http://www.census.gov/quickfacts>

Census Tracts

Location	Median Household Income	Per Capita Income	Persons Below Poverty Level	Percent Below Poverty Level
300	\$ 37,439	\$ 19,094	3,195	22.62%
301	\$ 35,318			
302	\$ 36,449			

Source: www.usa.com 2010 Census

Vulnerable Structures

Housing is an important consideration of mitigation planning. The concentration and the type of housing are two primary factors. In Lamar County there are a total of 7,517 housing units. Table 4-3 shows the housing characteristics of the county by jurisdiction.

Table 4-3: Lamar County Housing Characteristics

Geographic Area	Total Housing Units	Mobile Home Percent
Lamar County Total	7,326	24.0%
Beaverton	116	28.2%
Detroit	131	11.9%
Kennedy	238	25.0%
Millport	536	14.3%
Sulligent	972	18.7%
Vernon	1,033	7.2%
Unincorporated Area*	4,300	30.8%

Source: As of July 1, 2014 <http://www.census.gov/quickfacts>

The City of Vernon has the greatest concentration of housing units, followed closely by the City of Sulligent. Sulligent is the municipality with the highest number of mobile homes. However, at 30.8%, the unincorporated area has the highest percentage of mobile homes compared to its total number of housing units. Mobile home units are historically very vulnerable to a variety of hazards and prone to high amounts of damage and complete destruction.

Table 4-4 shows the building stock in Lamar County by general occupancy. The data provides the number of buildings by use and is shown by census tract. According to this data, provided by HAWS-MH MR3 2007 software, tract 301 has the highest number of structures in the county. Complementing this information is Table 4-5 that provides the value totals for these building types and is again shown by census tract 301 also has the highest total value for structures in the county.

Lamar County does not have any residential or commercial repetitive loss properties at this time.

Table 4-4: Building Stock by General Occupancy

Tract	Residential	Commercial	Industrial	Agriculture	Religious	Government	Education	Building Count
300	2,380	24	11	1	3	4	1	2,336
301	2,836	30	16	1	7	4	1	2,777
302	2,138	13	4	1	3	2	1	2,114

Source: www.usa.com 2010 Census

Table 4-5: Lamar County Building Exposure

Tract	Residential	Commercial	Industrial	Agriculture	Religious	Government	Education	Total Exposure
300	256,274	69,619	38,900	4,410	12,034	8,242	5,358	394,837
301	333,966	94,180	69,256	1,514	22,890	7,242	10,744	539,792
302	241,614	31,250	12,242	1,740	11,994	3,018	2,592	304,450

Source: HAWS-MH MR3 2007 Numbers shown in thousands dollars

Critical Facility Inventory

Critical facilities are crucial to the daily operation of Lamar County. Critical facilities help maintain a certain quality of life. Loss of operation could result in severe impacts on the community. Each of the critical facilities listed in Table 4-6 is vulnerable to each of the hazards identified in the risk assessment. Critical facilities include but are not limited to the following:

- Governmental Services
- Police and Fire Departments
- Public Works
- Education
- Industrial
- Medical

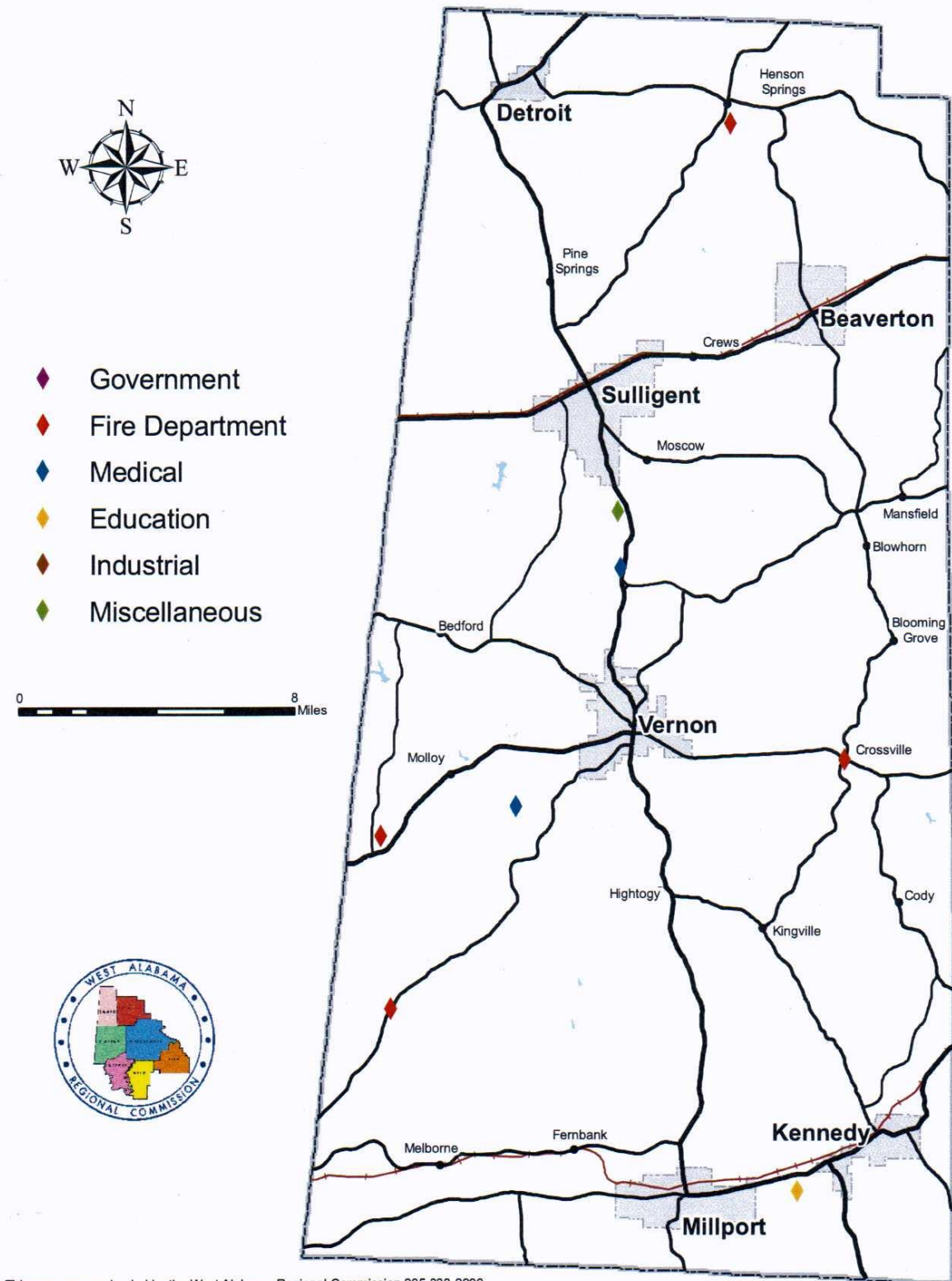
Each local government listed facilities based on the location of the facility without regard to or function. The Lamar County Courthouse, for example, is shown on the City of Vernon's list based on its location in the city. The County's list will show only what is located in the unincorporated areas. Each local government also provided addresses and approximate values for the facilities listed, using replacement values from their insurance policies when available. As part of the plan update the lists were expanded upon and reorganized, and many of the facilities (with the exception of water and sewer systems) have been mapped when adequate data was provided (see Map 4-2). The county's critical facility list and map are shown in this section while those for the individual jurisdictions are shown in Section Five.

TABLE 4-6: LAMAR COUNTY CRITICAL FACILITIES

Facilities	Location	Area	Use	Value
Governmental Services				
Crossville Fire Department	16090 Hwy. 18	Outside Vernon	Fire Protection	\$ 100,000
Henson Springs Fire Department	8288 River Road		Fire Protection	\$ 100,000
Molloy Fire Department	52 McGill Gin Road		Fire Protection	\$ 100,000
Star-Sunnyside Fire Department	County Road 9		Fire Protection	\$ 100,000
North Repeater	Water Tank Hill	Detroit	Fire and Law	\$ 50,000
Central Repeater	Wadsworth Road	Sulligent	Fire and Law	\$ 50,000
South Repeater	County Road 20		Fire and Law	\$ 50,000
Public Works				
Water Tank	Turner Hill	Lost Creek	Water Storage	\$ 300,000
Water Tank	Abernathy Road	West Of Sulligent	Water Storage	\$ 300,000
Water Tank	County Road 49 South	Crossville	Water Storage	\$ 300,000
Water Tank	County Road 20	Hightogy	Water Storage	\$ 300,000
Water Tank	Buck Jackson Road	Wofford	Water Storage	\$ 300,000
Water Tank	Convalescent Road	Vernon	Water Storage	\$ 300,000
Pump Station	278 East	Beaverton	Potable Water	\$ 90,000
Pump Station	Hwy. 17 /CR 35	Sulligent	Potable Water	\$ 90,000
Pump Station	Mulberry Road	Moscow	Potable Water	\$ 90,000
Pump Station	Aberdeen Road	Vernon	Potable Water	\$ 90,000
Pump Station	Blooming Grove Road	Blooming Grove	Potable Water	\$ 90,000
Pump Station	Thomas Road	Vernon	Potable Water	\$ 90,000
Pump Station	Hwy. 18	Vernon	Potable Water	\$ 90,000
Pump Station	County Road 49	Kennedy	Potable Water	\$ 90,000
Pump Station	County Road 49	Piney Grove	Potable Water	\$ 90,000
Education				
South Lamar School	Hwy. 96	Millport	Education	\$ 14,000,000
Sulligent School	Hwy. 17	Sulligent	Education	\$ 14,000,000
Vernon School	Hwy 18	Vernon	Education	\$ 14,000,000
Miscellaneous				
Lamar County Airport	49494 Hwy. 17		Transport	\$ 6,000,000
Care center of Vernon	150 Convalescent Road		Geriatric Care	\$ 10,000,000
Kennedy Sewer pump Station	110 County Road 49	Kennedy	Sewage	\$ 90,000
Millport Sewer pump Station	240 Millport manor Drive	Millport	Sewage	\$ 45,000

Source: Local Jurisdictions, Facilities Shown on Map 4-4

MAP 4-2: LAMAR COUNTY CRITICAL FACILITIES



This map was produced by the West Alabama Regional Commission 205 333-2990.
 Source: U.S. Census, Census 2000, TIGER Line Files, Lamar County Phone Books, GNIS,
 WARC and local jurisdictions. This map is not a survey product and should not be used for conveyance. Airfo/Lamar/Social/Public/LamarCF, March 2009

Construction Of new critical facilities includes two storm shelters currently being built in the Town of Millport. The shelters will be located at the main complex of the Millport Housing Authority on Hwy 96 and a smaller six-unit site located farther east on Hwy 96. The shelters will accommodate approximately 96 and 30 people respectively. The project is being funded through the FEMA HMGP program. The shelters will be completed in September of 2009.

Construction of additional critical facilities will follow future development

Development Trends

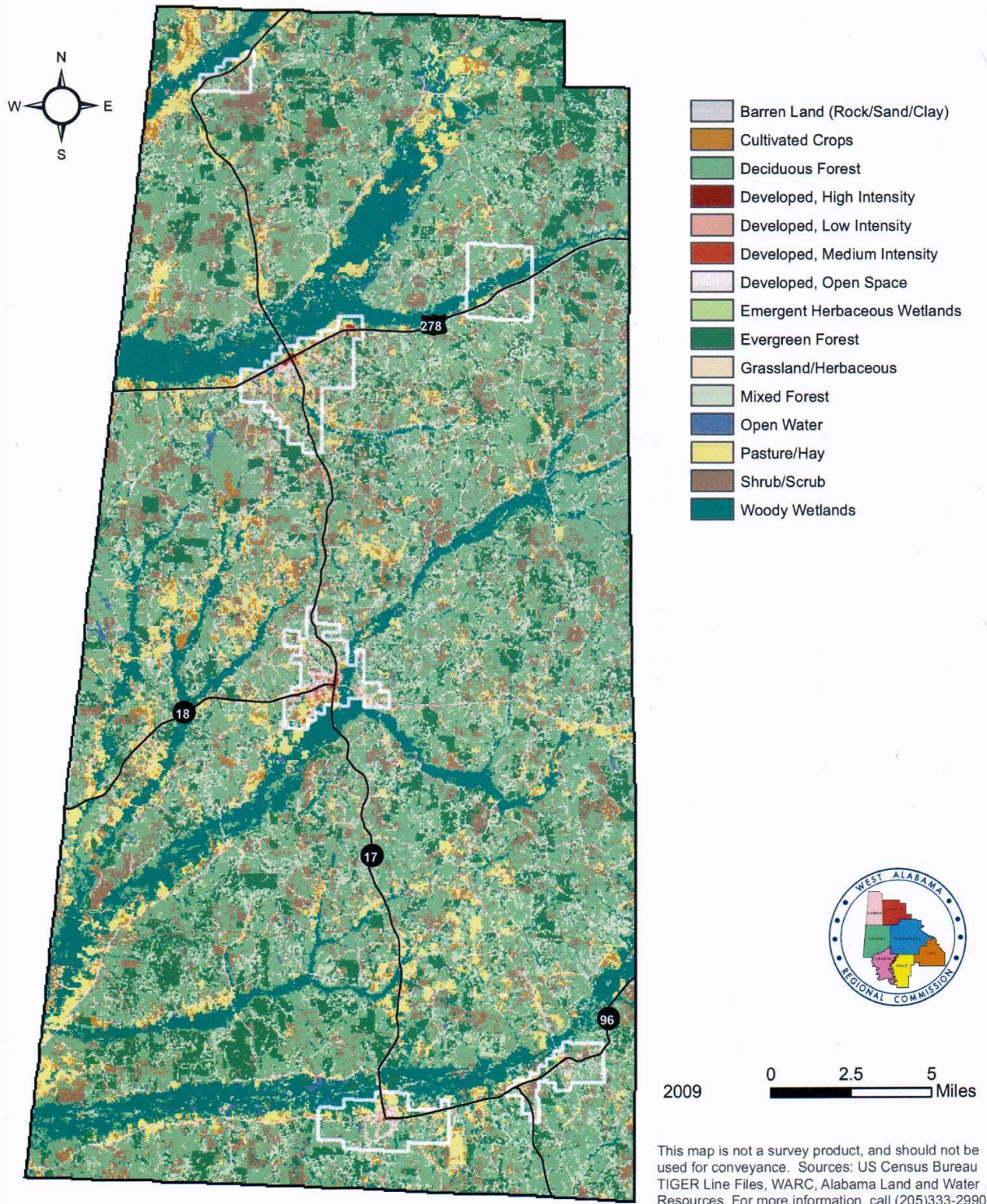
Lamar County as a whole is not projected to have any significant growth in population. The City of Sulligent was the only incorporated area that experienced even a small increase in population from 1980 to 2010. Table 4-7 shows the population projections for the years 2010, 2020, and 2025. The success of growth in Lamar County depends on access to four-lane highways, such as Interstate 22 (Corridor X) in Marion County and the proposed north-south corridor- Also, increasing U.S. Highway 278 to four lanes will contribute to the growth in this region. Map 4-3 shows the current land use land cover of Lamar County.

Table 4-7 Population Projections

2010	16,105
2020	16,179
2025	16,175
Source: Center for Business and Economic Research, University of Alabama	

The development trends in the county do not indicate any marked increase in vulnerability to the identified hazards. During the plan update the land use patterns were reviewed and it was determined that there have been no changes since the original plan. Additionally, no known or anticipated annexations by municipalities were identified during the plan update. Based on population projections and local development trends, development is expected to remain consistent within existing patterns.

Map 4-3: Lamar County Land Use Land Cover



Methods of Warning

Lamar County Emergency Management Agency and the county's jurisdictions have constructed a warning system that provides multiple ways to receive weather watches, warnings, and other emergency messages.

NOAA Weather Radio

NOAA Weather Radio is a nationwide network of radio stations broadcasting weather and other emergency information 24 hours a day. All National Weather Service-issued watches, warnings, forecasts and other emergency messages are broadcast on one of seven frequencies.

National Weather Service personnel at offices in Birmingham record weather information that plays in a cyclical pattern repeating every three to six minutes. Broadcasts generally include local area five-day forecasts, current weather conditions, radar reports, weather summaries, climatic data, river and lake stage readings, and other weather information. The broadcasts are continuously updated to provide the listener with the latest information.

NOAA Weather Radio is useful any time for the latest weather information but becomes even more important during severe or hazardous weather. During episodes of severe weather, the normal broadcast cycle is interrupted and focus shifted to the local severe weather threat. Watches, warnings, and statements are given the highest priority and are updated frequently as conditions change.

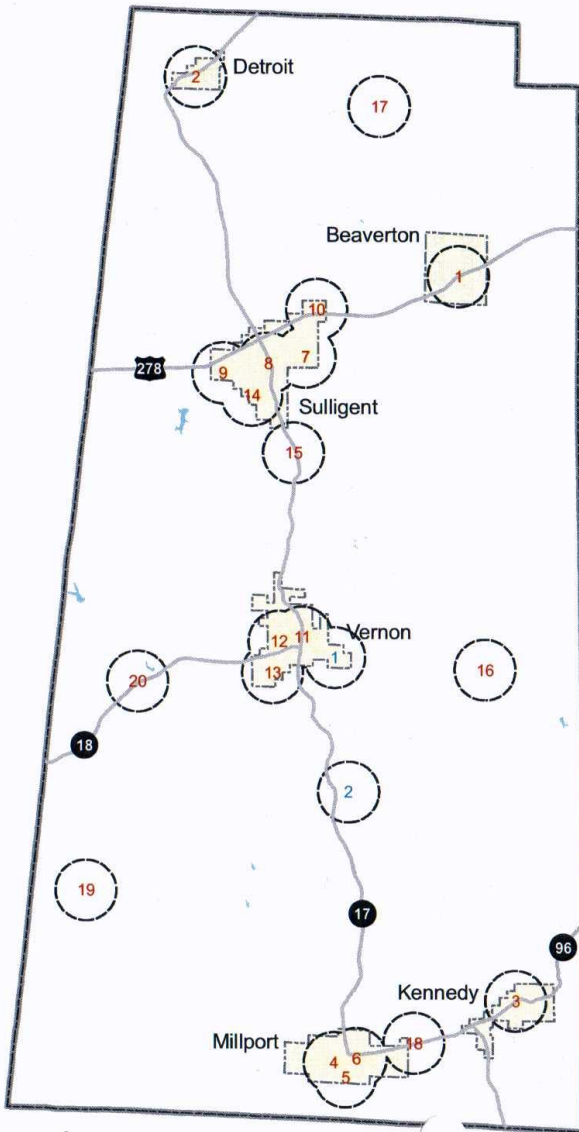
In an emergency, each transmitter is capable of transmitting a warning alarm tone signal and the new Specific Area Message Encoding (SAME) signal, followed by information on the emergency situation. These signals will activate specially designed receivers, either bringing up the volume or producing a visual and/or audible alarm. Not all weather band receivers have this capability, but all radios that receive NOAA Weather Radio transmissions can receive the emergency broadcasts. The warning alarm device is tested each Wednesday, between 11 am and noon, weather permitting.

Outdoor Warning Sirens

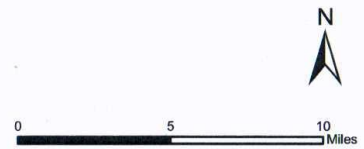
Lamar County EMA has 23 in-place outdoor warning sirens, although these sirens cover most of the populated areas, there are many places without an outdoor siren. Map 4-4 shows the existing sirens identified by number, location and audible buffer radius. Table 4-8 lists the existing sirens and is keyed to Map 4-4 for reference.

The existing sirens have an effective radiated coverage area of one mile around the siren. The sirens are activated only for Thunderstorm and Tornado Warnings but will be used to notify the public of Hazardous Materials Incidents in the near future. There is no ALL CLEAR siren sounding due to the possibility of public confusion. Weather Warnings sound like a long wail while Hazardous Material Alerts will have a distinct sound when the program goes on line. The siren blasts run three to five minutes. The sirens are activated from the Lamar County E-911 Office. Activations may be completed in three separate south to north groupings or via the entire system simultaneously

Map 4-4: Lamar County
Outdoor Warning System



- # Sirens Existing
- # Sirens Proposed
- 1 Mile Buffer of Sirens
- Municipal Boundary



This map is not a survey product, and should not be used for conveyance. Sources: US Census Bureau TIGER Line Files, WARC, Lamar County EMA. For more information, call (205)333-7000.

TABLE 4-8: Lamar County Outdoor Warning Sirens

Existing Sirens				
Number	Jurisdiction	Address	Latitude	Longitude
1	Beaverton	32492 CR 49	34.012483	-88.066012
2	Detroit	335 Real St	34.023220	-88.170496
3	Kennedy	17887 Hwy. 96	33.586099	-87.985993
4	Millport	152 Welch Street	33.557017	-88.091269
5	Millport	186 Sherry Street	33.550522	-88.083131
6	Millport	394 Old Kennedy Road	33.558423	-88.076373
7	Sulligent	2109 Wadsworth Rd	33.893038	-88.117628
8	Sulligent	157 Lollar Street	33.889875	-88.128951
9	Sulligent	2692 Wolf Road	33.886251	-88.153827
10	Sulligent	7709 Hwy. 278	33.914615	-88.104470
11	Vernon	44747 Hwy. 17	33.758686	-88.109889
12	Vernon	688 Columbus Ave NW	33.758051	-88.119204
13	Vernon	1119 County Road 9	33.740627	-88.125126
14	Sulligent	112 Miss Anne Drive	33.874910	-88.137290
15	Sulligent	51317 Hwy. 17	33.847410	-88.113604
16	County	16092 Hwy. 18	33.745064	-88.005515
17	Sulligent	8286 River Road	34.012483	-88.066012
18	Millport	14028 Hwy. 96	33.565061	-88.043388
19	Millport	11763 County Road 9	33.635648	-88.232034
20	Sulligent	52 McGill Gin Rd	33.737464	-88.202042
21	Vernon	234 14th Circle NE	33.747850	-88.084196
22	Millport	629 County Road 20	33.685563	-88.076719
23	Sulligent	374 Rescue Alley	33.893038	-88.117628

Source: Participating Jurisdictions

The entire countywide Outdoor Siren Warning System is periodically tested. Notification of testing is usually posted in the newspapers to avoid confusion. The general public is advised to not depend on hearing the sirens inside a building. The sirens are designed to be heard outdoors only and are installed near recreational areas and shopping malls where there are large outdoor populations. As a backup to the Outdoor Siren Warning System, police and fire units throughout the county can be instructed to sound their sirens.

Broadcast Media

One of the key elements of the Countywide Warning System is broadcast media. Most of the radio, television, and cable companies that serve Lamar County residents are dedicated to informing their audiences of impending emergencies. These broadcasters have partnered with the Lamar County Emergency Management Agency to bring their listeners and viewers fast, accurate, and important severe weather and civil emergency information via EAS and traditional newsgathering methods. Most of the television stations serving the Lamar County market (ABC 33/40, CBS 42, NBC 13, and Fox 6) feature live Doppler radar and certificated meteorologists. Many of the radio stations provide continuous severe weather coverage.

Vulnerability Summary

Table 4-9 provides a summary of Lamar County's vulnerability to specified hazards by jurisdiction. Each jurisdiction was tasked with considering how vulnerable they are to each hazard by considering the percentage of potential damage and the frequency of occurrences. Using information from the Risk Assessment in Section Three as well as the data in the earlier parts of this section as a basis for evaluation, the committee members assigned either N/A: Not Applicable, L: Low Risk, M: Medium Risk, and H: High Risk as defined in the Table Key.

Estimated Loss Projections

Table 4-10 shows the estimated loss projections for each hazard. The average number of occurrences per year is shown along with total number of deaths and injuries. The average amount of loss per event was determined by combining crop and property loss damages for each event type and then dividing by the corresponding total number of events reported during the sixty five-year study period. This amount is shown under the column heading Average Crop and Property Loss- There are instances where the Average Crop and Property Loss (per event) and Projected Loss (per Event) for an identified hazard could not be determined due to the absence of historical event data- This is a data limitation beyond the control of an affected jurisdiction. The Projected Loss is shown per event by hazard type. Due to the fluctuations in the value of a dollar over the sixty five-year study period, a 15% increase would be established. The Projected Loss was then calculated by adjusting the value of \$1.00 up to \$1.15, an increase to reflect the value of the dollar in the future. Average loss amounts were increased by 15% to achieve a value for an estimated loss per event occurrence.

Table 4-9: Lamar County Vulnerability Summary							
Natural Hazards	Beaverton	Detroit	Kennedy	Millport	Sulligent	Vernon	Unincorporated County
Thunderstorm/Wind	H	H	H	H	H	H	H
Lightning	H	H	H	H	H	H	H
Hail	M	M	M	L	M	M	H
Tornado	H	H	M	H	H	H	H
Flood	L	L	L	L	H	M	H
Drought/Extreme Heat	M	M	H	M	H	H	H
Winter Storm	M	H	M	H	H	H	H
Hurricane/Tropical Storm	L	H	H	H	M	M	H
Sinkhole/Expansive Soils	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Landslide	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Earthquake	L	M	L	L	L	L	M
Wildfire	M	M	M	H	H	H	M
Dam/Levee Failure	N/A	N/A	N/A	N/A	N/A	N/A	N/A
KEY: N/A = Not Applicable: not a hazard to the jurisdiction L = Low Risk: Little damage potential (damage to less than 5% of the jurisdiction) M = Medium Risk: moderate damage potential (damage to 5-10% of jurisdiction, infrequent occurrence) H = High Risk: significant risk/major damage potential (damage to over 10% of jurisdiction, regular occurrence)							

Table 4-10: Lamar County Estimated Loss Projections from Specific Hazards

Natural Hazards	Average Occurrences* (per year)	Total Deaths	Total Injuries	Average Crop and Property Loss* (per event)	Projected Loss* (per event)
Thunderstorm/Wind	3.4	0	0	\$8,911	\$10,248
Lightning	.11	0	7	20,333	23,383
Hail	1.2	0	0	3,772	4,338
Tornado	.5	2	3	164,618,	189,311
Flood	.8	0	0	8,520	9,798
Drought/Extreme Heat	.1	0	0	0	0
Winter Storm/Freeze	.5	0	0	70,067	80,577
Hurricane/Tropical Storm	.2	0	0	68,701	79,006
Sinkhole/Expansive Soils	0	0	0	0	0
Landslide	0	0	0	0	0
Earthquake	.03	0	0	0	0
Wildfire	.2	0	0	0	0
Dam/Levee Failure	0	0	0	0	0
<p>Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the 11 year period. Deaths and injuries were taken from the hazard event data. Average loss was calculated by dividing the total amount of all damages by the total number of occurrences during the 11 year period. Projected loss expresses an estimated damage amount per future occurrence by multiplying the average loss figure times 15%.</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the average occurrence average loss or projected loss per event. 					
Source: NOAA, Alabama Forestry Commission, Geological Survey of Alabama					

Mitigating Potential Losses

The Hazard Mitigation Planning Committee set forth mitigation goals and objectives for the county and its jurisdictions. Each jurisdiction set forth its own mitigation action plans located in Section Five. Participating local governments contributed at least one action to the mitigation action plan or they are included in a listed action.

Mitigation Strategy

In the preparation of the mitigation strategy, the Hazard Mitigation Planning Committee reconsidered the goals and objectives of the initial plan and chose to revise them in order to provide a framework that would better serve the county and its local governments and meet the purposes of the hazard mitigation plan. The committee agreed upon a uniform set of selected goals that are decidedly broad in scope in order to accommodate a variety of potential objectives. Objectives were chosen to further define how to address accomplishing a given goal based on the needs of the county. Finally, actions are identified to achieve the various objectives and vary by jurisdiction in order to address unique risks. At this time the Lamar County Fire and Rescue Association and the Lamar County School Board has no mitigation strategies but if anything changes strategies will be added as revisions.

Mitigation Actions

In order to consider a comprehensive range of potential mitigation measures the Hazard Planning Committee reviewed the FEMA planning tool Mitigation Ideas: Possible Mitigation Measures by Hazard Type (See Appendix I). Each jurisdiction selected its own mitigation actions 10 support the goals and objectives of the mitigation strategy. Actions identify the activity, what hazard(s) are addressed, whether the activity applies to a new or existing asset, and an estimated cost. The action also identifies the planning mechanism, possible funding sources, and a time frame for completion of the activity. Local governments then prioritized the actions by assigning the highest priority action as number one and so on. At this time the Lamar County Fire and Rescue Association and the Lamar County School Board has no mitigation actions but if anything changes the actions will be added as revisions. Priorities are based on a scale of 1 through 7 with 1 being the highest priority and 7 being the lowest priority.

In the course of developing this Plan, participating communities were asked to help establish priorities for planning for natural hazards. They were given a series of statements and were asked whether the statement was extremely important, very important, somewhat important, or not important. The responses were given a weighted score and ranked. The following statements reflect their priorities based on their responses and are listed in order of importance.

1. Protecting critical facilities (e.g. fire stations, hospitals, etc.).
2. Protecting and reducing damage to utilities.
3. (tie) Strengthening emergency services (e.g. police, fire, ambulance).
3. (tie) Promoting cooperation among agencies, citizens, business, etc.
4. Enhancing the function of natural areas (e.g. streams, wetlands).
5. Protecting private property.
6. Preventing development in hazard areas.
7. Protecting historical and cultural landmarks.

Action Priority and Cost Benefit Review

In the selection and prioritization of mitigation actions, each member was asked to consider the following: funding options, political support, public support, legality, preservation of the environment, and staff capability. The committee then looked at each strategy in terms of costs and benefits. Not only were direct costs and benefits considered, but indirect costs and benefits were also acknowledged. Indirect costs and/or benefits are often intangible attributes such as social effects.

Priority mitigation actions will be implemented only if they are cost beneficial; maximum benefits must outweigh the associated costs of the proposed actions. The Planning Committee performed a general evaluation of each mitigation measure, which might require FEMA funds. The committee weighed the estimated costs for

each mitigation measure against the projected benefits of the action. A more detailed benefit-cost analysis will be required for each priority action to determine economic feasibility during the project-planning phase. Projects will also require a more detailed evaluation for eligibility and feasibility including social impact, environmental impact, technical feasibility, and other criteria that measure effectiveness. This detailed evaluation of actions will be performed in the pre-application phase of a grant request. Further, action implementation will be subject to the availability of FEMA grants and other sources of funding from year-to-year.

The actions in the following tables have been ranked based on a cost-benefit review conducted by the Lamar County Planning Committee through the planning process. Each implementing action has been provided a priority of low, medium, or high based on this review. The following provides a breakdown of the factors utilized to conduct this cost benefit review:

1. **High Priority** – Highly cost-effective, administratively feasible and politically feasible strategies that should be implemented in fiscal years 2016/2017 and 2017/2018 and be continued.

2. **Medium Priority** – Strategies that have at least two of the following characteristics (but not all three) and should be implemented in fiscal years 2017/2018 to 2018/2019:

- Highly cost-effective; or
- Administratively feasible, given current levels of staffing and resources; or
- Are politically popular and supportable given the current environment.

3. **Low Priority** – Strategies that have at least one of the following characteristics (but not two or three) and should be implemented in the next five(5) years (by the end of 2019/2020):

- Highly cost-effective; or
- Administratively feasible, given current levels of staffing and resources; or
- Are politically popular and supportable given the current environment.

Mitigation Status

During the plan update mitigation actions were reviewed in order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. New actions identified during the update planning process have also been added to the plan. Some actions were identified as serving the purpose of preparedness, response, and recovery to an extent that warranted removal from the plan. The hazard planning committee agreed that such actions did not meet the intent of mitigation planning or the eligibility of mitigation grant programs. In order to track the progress of identified actions, Lamar County's original 2005 Mitigation Plan list is shown below. The current status of the proposed action is shown in *italics*.

BENCHMARKING:

Lamar County Mitigation Plan (2005)

Current Projects

- NFIP participant —Action deferred and revised in plan update
- Shelter Program — Action ongoing and deferred in plan update

Future Projects

1. Add additional Outdoor Warning Sirens —Deferred
2. Add indoor warning systems for public buildings (i.e., schools, industry) —Deferred and revised
3. Evaluate, plan, and implement drainage improvement projects —Deferred
4. Assist with constructing storm shelters across the county — Deferred

5. Add warning and response systems for snow and ice storms throughout the county-- Action Revised
6. Initiate a Fire Prevention Program to educate residents on fire prevention —Deferred
7. Replace outdated or worn fire equipment - Deferred
8. Update communications system UHF/VHF/800)-Revised and deferred
9. Update EARS - Deferred
10. Encourage non-participating jurisdictions to join NFIP -Deferred (all jurisdictions are participants in program)

Table 4-11 shows the county mitigation actions. Each jurisdiction set forth its own Set of mitigation actions in Section Five of the plan. During the plan update process new actions were identified and added to the plan.

Mitigation Strategy - Lamar County Goals remain the same as the last plan

Goal 1: Protect life

Objective 1: Improve Warning and Emergency Communication Systems

Action 1...1.1 Install additional outdoor warning sirens

Action 1.1.2 Upgrade communication system

Action1. 1.3 Provide indoor warning systems at critical facilities

Objective 1.2: Reduce impact of hazards on vulnerable populations

Action 1.2.1 Encourage Individual Storm Shelters in county

Objective 1.3: Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1: Reduce losses to critical facilities/assets

Action 2.1.1 Provide emergency generators at critical facilities

Objective 2.2: Continue Participation in NFIP program

Action 2.2.1Enforcefloodplain management requirement; regulate construction or improvements in Special Flood Hazard Areas

Objective 2.3provide and maintain essential public services

Objective 2.4Reduce losses due to drainage problems

Action 2.4.1 Upgrade drainage systems

Goal 3: Reduce economic impacts of disasters

Objective 3 .1: Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1: Identify, protect, and properly manage floodplains

Objective 4.2: Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1: Continue to train severe weather spotters

Future mitigation goal additions may be added by the Lamar County Fire and Rescue Association and the Lamar County School Board once a mitigation need arises and can be implemented.

Table 4-11: Lamar County Mitigation Actions

Mitigation Action	Implement Drainage Improvements
Hazard(s) Addressed	Flooding
Applies to new/existing asset	Existing
Local Planning Mechanism	Lamar County, Jurisdiction
Time Frame For Completion	One Year from Funding Availability
Estimated Cost	\$ 7,500,000
Funding Sources	Local Grants
Priority	1

Mitigation Action	Install Additional Outdoor Warning Sirens
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Lamar County EMA
Time Frame For Completion	One Year from Funding Availability
Estimated Cost	\$ 20,000 each
Funding Sources	Grants, Local
Priority	2
Mitigation Action	Provide indoor warning systems to critical facilities
Hazard(s) Addressed	All
Applies to new/existing asset	Lamar County EMA
Local Planning Mechanism	New
Time Frame For Completion	One Year from Funding Availability
Estimated Cost	\$30,000
Funding Sources	Grants, Local
Priority	3
Mitigation Action	Individual Storm Shelters throughout County (568 Units)
Hazard(s) Addressed	All
Applies to new/existing asset	New
Local Planning Mechanism	Lamar County EMA
Time Frame For Completion	5 Years from Funding Availability - Have Applied
Estimated Cost	\$ 2,130,000
Funding Sources	Grants, Local
Priority	3
Mitigation Action	Upgrade Communications Equipment
Hazard(s) Addressed	All
Applies to new/existing asset	Existing
Local Planning Mechanism	Lamar County EMA
Time Frame For Completion	One Year from Funding Availability
Estimated Cost	\$ 80,000
Funding Sources	Grants, Local
Priority	2

Mitigation Action	Enforce Floodplain Management Requirements: Regulate Construction or improvements in Special Flood Hazard Areas (SFHA's).
Hazard(s) Addressed	Flood
Applies to	New and Existing
Local Planning	Lamar County
Time Frame For	Continuous
Estimated Cost	\$ 100,000
Funding Sources	Local
Priority	2

Mitigation Action	Provide Emergency Generators to Critical Facilities
Hazard(s) Addressed	All
Applies to	Existing
Local Planning	Lamar County, Jurisdictions
Time Frame for	One Year from Funding Availability
Estimated Cost	\$ 25,000
Funding Sources	Local, Grants
Priority	2

Future mitigation action additions may be added by the Lamar County Fire and Rescue Association and the Lamar County School Board once a mitigation need arises and can be implemented.

Section Five:

Jurisdiction Assessments

Town of Beaverton

Table 5-1:
Town of Beaverton
Risk and Vulnerability Overview

Natural Hazards	Hazard Identification	Prioritized Threat	Vulnerability
Thunderstorm/Wind	X	2	H

Lightning	X	3	H
Hail	X	6	M
Tornado	X	1	H
Flood	X	9	L
Drought/Extreme Heat	X	4	M
Winter Storm	X	5	M
Hurricane/Tropical Storm	X	8	L
Sinkhole/Expansive Soils	X	11	L
Landslide	X	12	L
Earthquake	X	10	L
Wildfire	X	7	M
Dam/Levee Failure	N/A	N/A	N/A
KEY Hazard Identification X = Affects the Jurisdiction , N/A = Not a threat to the jurisdiction Priority: Hazards are prioritized with the highest threat assigned number one. Vulnerability: NA = Not Applicable; not hazard to the Jurisdiction L = Low Risk, Little damage potential (damage to less than 5% of the jurisdiction.) M = Medium Risk, Moderate damage potential (damage to 5-10% of the jurisdiction, infrequent occurrence) H = High Risk, significant risk/ major damage potential (damage to over 10% of jurisdiction, regular occurrence)			
Source: Participating Jurisdictions			

Table 5-2: Town of Beaverton Hazard Events
All Hazards January 1, 2004 - December 31, 2015

Location	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage	Total cost	Comments
Beaverton	4/21/2005	Hail	1.75"			\$2,000		\$2,000	
Beaverton	4/21/2005	Hail	1.00"			\$1,000		\$1,000	
Beaverton	4/07/2006	Hail	.75"						
Beaverton	07/21/2006	Thunderstorm/Wind	50 Knots			\$3,000		\$3,000	
Beaverton	11/15/2006	Thunderstorm/Wind	50 Knots			\$5,000		\$5,000	

Beaverton	8/24/2007	Thunderstorm/Wind	50 Knots			\$3,000		\$3,000	
Beaverton	2/06/2008	Tornado	EF-1			\$50,000		\$50,000	
Beaverton	06/04/2009	Flash Flood							
Beaverton	4/24/2010	Hail	1.00"						
Beaverton	10/25/2010	Thunderstorm/Wind	60 Knots			\$ 3,000		\$3,000	
Beaverton	4/20/2011	Thunderstorm/Wind	50 Knots			\$ 20,000		\$20,000	
Beaverton	05/08/2012	Flash Flood							
Beaverton	07/06/2012	Thunderstorm/Wind	50 Knots			0		0	
Beaverton	4/27/2013	Thunderstorm/Wind	56 knots			0		0	
Beaverton	06/09/2014	Thunderstorm/Wind	52 knots			0		0	
Beaverton	10/13/2014	Tornado	EF-0						
Beaverton	3/31/2015	Hail	1.25"						
Beaverton	07/22/2015	Thunderstorm/Wind	50 Knots			0		0	
Totals	18			0	0	\$87,000	\$ 0	\$87,000	

Source: National Climatic Data Center

Wildfires **January 1, 2004 - December 31, 2015**

Location	Date	Type	Acres	Deaths	Injuries	Property Damage	Crop Damage	Total Cost	Comments
Beaverton	6/17/2006	Campfires	10						
Beaverton	10/12/2006	Smoking	19						
Beaverton	2/26/2012	Unknown	12						
Totals		3	41	0	0	\$ 0	\$ 0	\$ 0	

Source: Alabama Forestry Commission

<p>Table 5-3: Town of Beaverton Hazard Probability Assessment</p>				
Natural Hazards	Number of Historical Occurrences*	Probability of Future Occurrence*	Extent*	Area Affected
Thunderstorm/Wind	9	0.002%	>10%	Town-wide

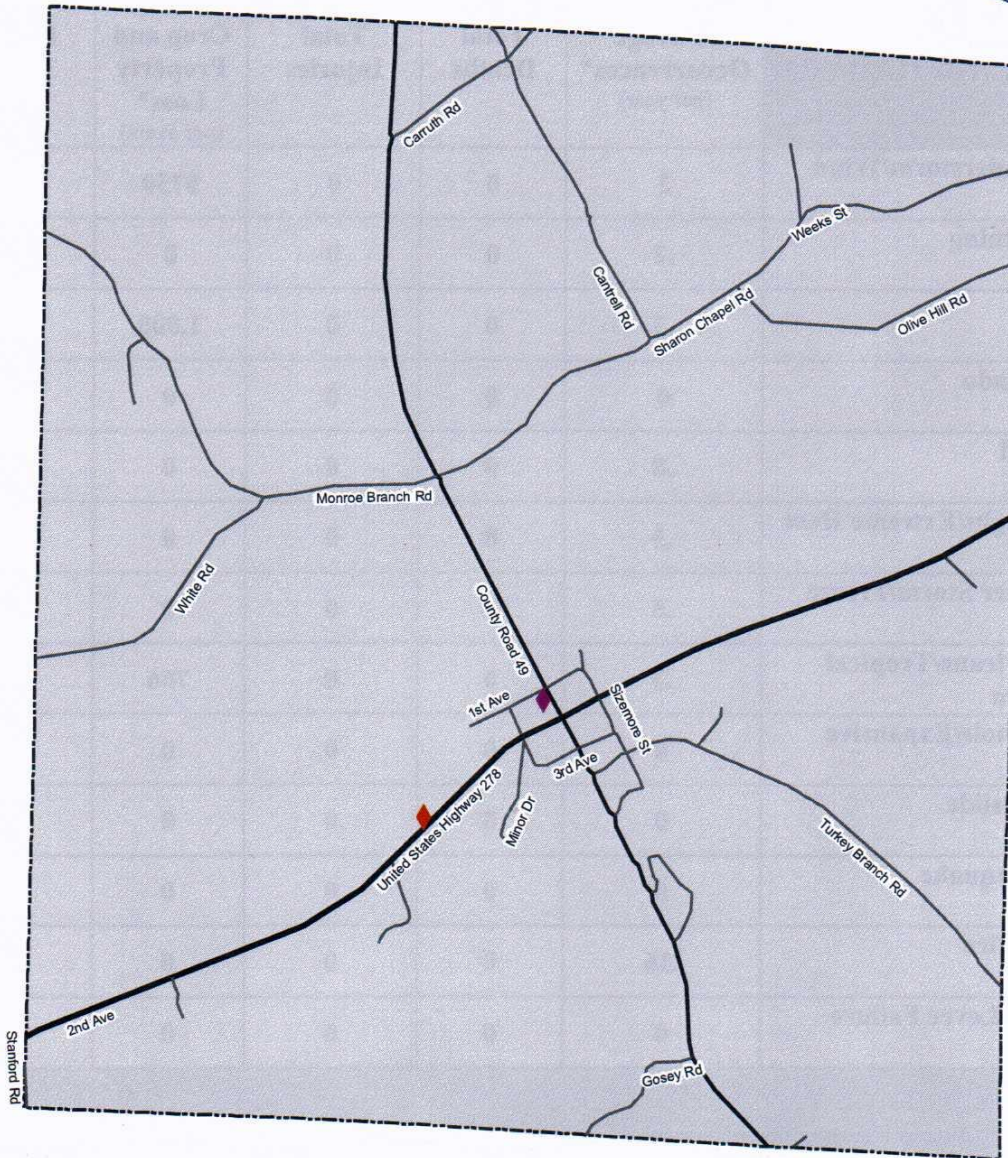
Lightning	0	0.00%	>10%	Town-wide
Hail	5	0.001%	5-10%	Town-wide
Tornado	2	0.0004%	>10%	Town-wide
Flood	1	0.0002%	<5%	Town-wide
Drought/Extreme Heat	3	0.04%	5-10%	Town-wide
Winter Storm	5	0.07%	5-10%	Town-wide
Hurricane/Tropical Storm	3	0.0006%	<5%	Town-wide
Sinkhole/Expansive Soils	0	0	0	N/A
Landslide	0	0	0	N/A
Earthquake	0	0	0	N/A
Wildfire	3	0.0007%	5-10%	Town-wide
Dam/Levee Failure	0	0	0	N/A
<p>Methodology: Number Of historical occurrences is events reported by all sources during the 11 year period of January 1, 2004 — December 31, 2015. Probability is expressed as a percentage Of the chance of an event occurring on any day by dividing the number of historical events by 4,384 (days in the 11 year period). Extent is expressed as the percentage assigned by the jurisdiction's ranking in the vulnerability summary (Table 4-9).</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the probability, extent, or affected area. 				
Source: NOAA, Alabama Forestry Commission, U. S. Forest Service, Participating Local Jurisdictions				

Table 5-4: Town of Beaverton Critical Facilities

Facilities	Location	Use	Values
Governmental Services			
Beaverton Town Hall	32490 County Road 49	Local Government	\$ 174,000
Beaverton Fire Dept.	12495 Hwy. 278	Fire Protection	\$ 150,000

Public Works			
County Pumping station	13133 Hwy. 278	Water System	\$ 90,000
County Water Tank # 1	61561 County Road 49	Potable Water	\$ 300,000
County Water Tank # 2	751 Cantrell Road	Potable Water	\$ 300,000
Education			
Industrial			
Miscellaneous			
Outdoor Warning Siren # 1	32490 County Road 49	Weather Warning	\$ 12,500
Source Local Jurisdictions		Total	\$ 927,500

MAP 5-1: TOWN OF BEAVERTON CRITICAL FACILITIES



- ◆ Government
- ◆ Fire Department
- ◆ Medical
- ◆ Education
- ◆ Industrial
- ◆ Miscellaneous



0 0.5 Miles

This map was produced by the West Alabama Regional Commission 205 333-2990.
Source: U.S. Census, Census 2000, TIGER Line Files, Lamar County Phone Books, GNIS,
WARC and local jurisdictions. This map is not a survey product and should not be used for conveyance.
Ainfo/Lamar/Towns/Beaverton/Social/Public/BeavertonCF, March 2009

Table 5-5:
Town of Beaverton
Estimated Loss Protections from Specified Hazards

Natural Hazards	Average Occurrences* (per year)	Total Deaths	Total Injuries	Average Crop and Property Loss* (per event)	Projected Loss* (per event)
Thunderstorm/Wind	.81	0	0	\$14,000	\$16,100
Lightning	.0	0	0	0	0
Hail	.45	0	0	\$ 3,000	\$ 3,450
Tornado	.18	0	0	\$50,000	\$ 57,500
Flood	.09	0	0	0	0
Drought/Extreme Heat	.27	0	0	0	0
Winter Storm/Freeze	.54	0	0	0	0
Hurricane/Tropical	.27	0	0	0	0
Sinkhole/Expansive Soils	0	0	0	0	0
Landslide	0	0	0	0	0
Earthquake	0	0	0	0	0
Wildfire	.27	0	0	0	0
Dam/Levee Failure	0	0	0	0	0
<p>Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the 11 year period. Deaths and injuries were taken from the hazard event data. Average loss was calculated by dividing the total amount of all damages by the total number of occurrences during the 11 year period. Projected loss expresses an estimated damage amount per future occurrence by multiplying the average loss figure times 15%.</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the average occurrence average loss or projected loss per event. 					
Source: Alabama Forestry Commission, Participating Jurisdiction					

Town Of Beaverton Mitigation Action Plan

The Town Of Beaverton recognizes the importance of Mitigation Planning and will incorporate Mitigation planning in planning documents as they are revised or initiated.

Mitigation Status

During the plan update mitigation actions were reviewed in Order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. New actions identified during the update planning process have also been added to the plan. Some actions were identified as serving the purpose of preparedness, response, and recovery to an extent that warranted removal from the plan. The hazard planning committee agreed that such actions did not meet the intent of mitigation planning or the eligibility of mitigation grant programs. In order to track the progress of identified actions, the Town of Beaverton's original 2005 Mitigation Plan list is shown below. The current status of the proposed actions is shown in *Italics*.

BENCHMARKING:

Town Of Beaverton Mitigation Plan (2005)

Current Projects

- There are no hazard mitigation projects currently underway

Future Projects

1. Add outdoor Warning sirens — Deferred
2. Indoor warning systems for public buildings — Deferred
3. Construct a community storm shelter — Deferred
4. Encourage individual storm shelters — Deferred

Table 5-6 shows the Town of Beaverton's updated mitigation actions. During the plan update process new actions were identified and added to the plan.

Mitigation Strategy — Town of Beaverton

Goals remain the same as the last plan

Goal 1: Protect life

Objective 1.1: Improve Warning and Emergency Communication Systems

Action 1.1: Upgrade communications equipment

Objective 1.2: Reduce impact of hazards on vulnerable populations

Action I. 2: Construct short-term community storm shelter

Objective 1.3: Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Objective 2.2 Continue Participation in NFIP program

Action 2.2: Enforce floodplain management requirements, regulate construction or improvements in Special Flood Hazard Areas (SFHAs).

Objective 2.3 Provide and maintain essential public services

Action 2.3: Clear power line rights-of-way

Objective 2.4 Reduce losses due to drainage problems

Action 2.4: Upgrade drainage systems to add culverts, pipe, storm drains

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage floodplains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 5-6: Town of Beaverton Mitigation Actions

Mitigation Action	Upgrade communications Equipment
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Town of Beaverton, Lamar County EMA
Time Frame for Completion	One Year from Funding Availability
Estimated Cost	\$ 150,000
Funding Sources	Local Grants
Priority	1
Mitigation Action	Build Short-term Community Storm Shelters
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Lamar County EMA, Town of Beaverton
Time Frame for Completion	One Year from Funding Availability
Estimated Cost	\$ 75,000
Funding Sources	Grants, Local
Priority	2
Mitigation Action	Upgrade Drainage System, add Culverts, Pipe, Storm Drains
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	New
Local Planning Mechanism	Town of Beaverton, Public Works
Time Frame for Completion	One Year from Funding Availability
Estimated Cost	\$ 200,000
Funding Sources	Grants, Local
Priority	2
Mitigation Action	Enforce Floodplain Management Requirements, Regulate Construction or Improvements in Special Flood Hazard Areas (SFHA's)
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	New and Existing
Local Planning Mechanism	Town of Beaverton, Public Works
Time Frame for Completion	Continuous
Estimated Cost	\$100,000
Funding Sources	Local
Priority	1
Mitigation Action	Clear Power Line Rights-of Way
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Town of Beaverton, Lamar County Commission, State Highway Department
Time Frame for Completion	One to Two Years from Funding Availability
Estimated Cost	\$ 5,000
Funding Sources	Local Grants
Priority	2

Town of Detroit

**Table 5-7:
Town of Detroit
Risk and Vulnerability Overview**

Natural Hazards	Hazard Identification	Prioritized Threat	Vulnerability
Thunderstorm/Wind	X	2	H
Lightning	X	5	H
Hail	X	7	M
Tornado	X	3	H
Flood	X	10	L
Drought/Extreme Heat	X	8	M
Winter Storm	X	1	H
Hurricane/Tropical Storm	X	4	H
Sinkhole/Expansive Soils	N/A	N/A	N/A
Landslide	N/A	N/A	N/A
Earthquake	X	9	M
Wildfire	X	6	M
Dam/Levee Failure	N/A	N/A	N/A

KEY

Hazard Identification

X = Affects the Jurisdiction , N/A = Not a threat to the jurisdiction

Priority:

Hazards are prioritized with the highest threat assigned number one.

Vulnerability:

NA = Not Applicable; not hazard to the Jurisdiction

M = Low Risk, Little damage potential (damage to less than 5% of the jurisdiction.)

M = Medium Risk, Moderate damage potential (damage to 5-10% of the jurisdiction, infrequent occurrence)

H = High Risk, significant risk/ major damage potential (damage to over 10% of jurisdiction, regular occurrence)

Source: Participating Jurisdictions

Table 5-8: Town of Detroit Hazard Events
All Hazards January 1, 2004 - December 31, 2015

Location	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage	Total cost	Comments
Detroit	11/23/2004	Hail	1.25"						
Detroit	11/23/2004	Tornado	EF-1			\$300,000		\$300,000	
Detroit	12/07/2004	Thunderstorm/Wind	55 knots			\$ 2,000		\$ 2,000	
Detroit	05/13/2006	Hail	1.75"						
Detroit	07/28/2006	Hail	.88"						
Detroit	12/09/2008	Thunderstorm/Wind	50 knots			\$1,000		\$1,000	
Detroit	04/02/2009	Thunderstorm/Wind	50 knots			\$1,000		\$1,000	
Detroit	04/10/2009	Thunderstorm/Wind	50 knots			\$1,000		\$1,000	
Detroit	06/12/2009	Thunderstorm/Wind	60 knots			\$20,000		\$20,000	
Detroit	06/14/2009	Thunderstorm/Wind	50 knots			\$2,000		\$2,000	
Detroit	06/14/2009	Thunderstorm/Wind	50 knots			\$2,000		\$2,000	
Detroit	06/15/2009	Thunderstorm/Wind	50 knots			\$2,000		\$2,000	
Detroit	07/30/2009	Thunderstorm/Wind	50 knots						
Detroit	10/09/2009	Thunderstorm/Wind	50 Knots			\$1,000		\$1,000	
Detroit	06/26/2010	Thunderstorm/Wind	50 Knots			\$1,000		\$1,000	
Detroit	08/15/2010	Thunderstorm/Wind	55 Knots			\$2,000		\$2,000	
Detroit	01/01/2011	Flash Flood							
Detroit	03/26/2011	Hail	1.00"						
Detroit	04/04/2011	Thunderstorm/Wind	50 Knots						
Detroit	04/04/2011	Hail	1.00"						
Detroit	04/20/2011	Thunderstorm/Wind	39 Knots			\$500		\$500	
Detroit	04/20/2011	Thunderstorm/Wind	50 Knots			\$5,000		\$5,000	
Detroit	03/02/2012	Hail	.88"						
Detroit	03/02/2012	Thunderstorm/Wind	70 Knots						
Detroit	03/02/2012	Hail	.88"						
Detroit	03/08/2012	Thunderstorm	50 Knots						
Detroit	03/31/2012	Hail	1.50"						
Detroit	05/20/2012	Thunderstorm/Wind	65 Knots						
Detroit	05/20/2012	Thunderstorm/Wind	55 Knots						
Detroit	07/06/2012	Thunderstorm/Wind	50 Knots						
Detroit	07/23/2013	Thunderstorm/Wind	55 Knots						
Detroit	04/04/2014	Thunderstorm/Wind	50 Knots						
Detroit	04/07/2014	Flash Flood							
Detroit	04/07/2014	Flood							
Detroit	07/02/2014	Thunderstorm/Wind	50 Knots						
Totals		35		0	0	\$340,500	\$ 0	\$340,500	

Source: National Climatic Data Center

Wildfires **January 1, 2004 - December 31, 2015**

Location	Date	Type	Acres	Deaths	Injuries	Property Damage	Crop Damage	Total Cost	Comments
Detroit	7/15/2006	Debris	67						
Detroit	8/18/2006	Smoking	12						
Detroit	10/9/2010	Arson	23						
Totals		3	102	0	0	\$ 0	\$ 0	\$ 0	

Source: Alabama Forestry Commission

**Table 5-9:
Town of Detroit
Hazard Probability Assessment**

Natural Hazards	Number of Historical Occurrences*	Probability of Future Occurrence*	Extent*	Area Affected
Thunderstorm/Wind	23	0.005%	>10%	Town-wide
Lightning	0	0.00%	>10%	Town-wide
Hail	8	0.001%	5-10%	Town-wide
Tornado	1	0.0002%	>10%	Town-wide
Flood	3	0.0006%	>5%	North of AL Hwy. 17
Drought/Extreme Heat	3	0.0006%	5-10%	Town-wide
Winter Storm	6	0.001%	5-10%	Town-wide
Hurricane/Tropical Storm	3	0.0006%	>10%	Town-wide
Sinkhole/Expansive Soils	0	0	0	N/A
Landslide	0	0	0	N/A
Earthquake	0	0	0	N/A
Wildfire	3	0.0007%	>10%	Town-wide
Dam/Levee Failure	0	0.0002%	>10%	Town-wide

Methodology: Number Of historical occurrences is events reported by all sources during the 11 year period of January 1, 2004 — December 31, 2015. Probability is expressed as a percentage Of the chance of an event occurring on any day by dividing the number of historical events by 4, 384 (days in the 11 year period). Extent is expressed as the percentage assigned by the jurisdiction's ranking in the vulnerability summary (Table 4-9).

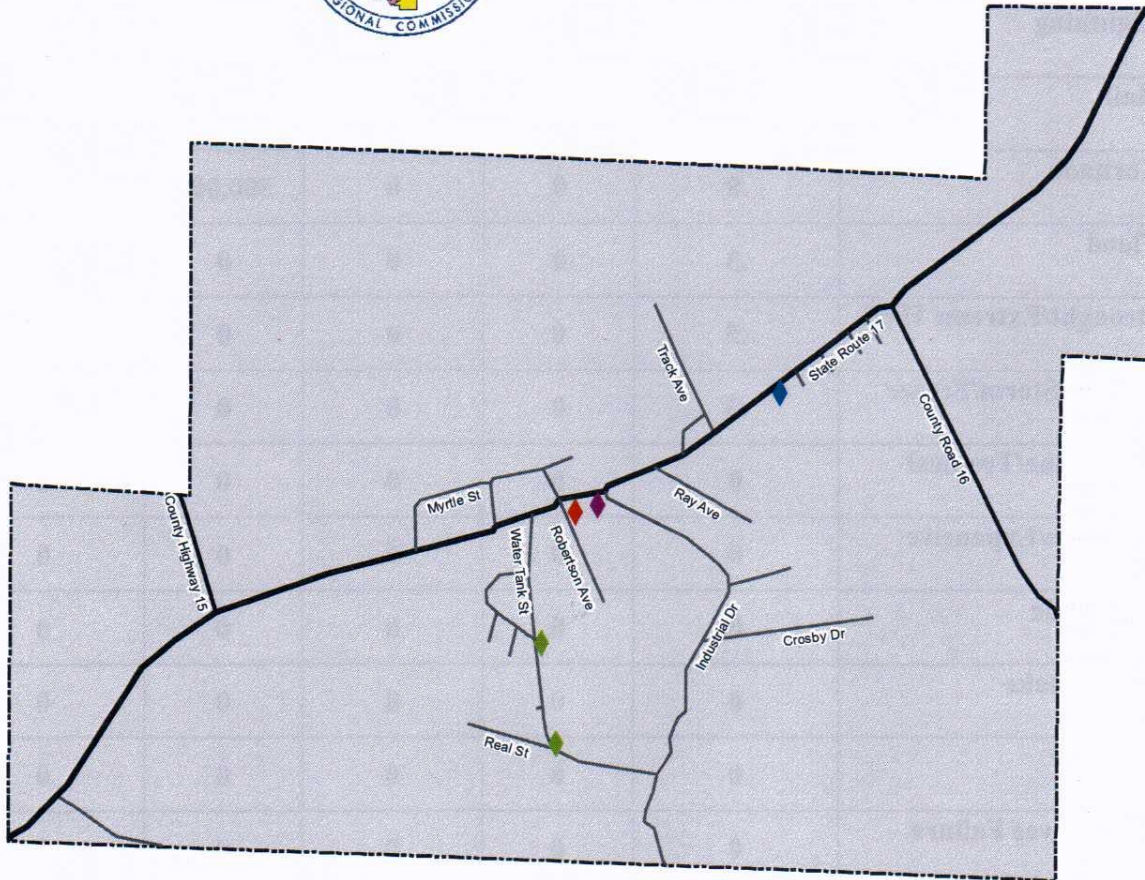
- Zero denotes no data available to determine the probability, extent, or affected area.

Source: NOAA: Alabama Forestry Commission, U.S. Forest Service, Participating Local Jurisdictions

Table 5-10: Town of Detroit Critical Facilities

Facilities	Location	Use	Values
Governmental Services			
Detroit Town Hall	55347 Hwy. 17	Local Government	\$ 617,444
Detroit Fire Dept.	55243 Hwy. 17	Fire Protection	\$ 184,406
Public Works			
County Water Tank # 1	241 Water Tank Street	Potable Water	\$ 300,000
County Water Tank # 2	Real Street	Potable Water	\$ 300,000
Water Treatment # 1	Robinson Avenue	Potable Water	\$ 75,000
Water Treatment # 2	Myrtle Street	Potable Water	\$ 75,000
Sewer Lagoon (Housing Authority)	Track Avenue	Sanitary Sewer	\$ 150,000
Education			
Industrial			
Miscellaneous			
Communications Tower	242 Water Tank Street	Communications	\$ 515,000
Communications Tower	326 Real Street	Communications	\$ 515,000
Outdoor Warning Siren # 2	326 Real Street	Weather Warning	\$ 15,000
Source Local Jurisdictions		Total	\$ 2,746,850

MAP 5-2: TOWN OF DETROIT CRITICAL FACILITIES



- ◆ Government
- ◆ Fire Department
- ◆ Medical
- ◆ Education
- ◆ Industrial
- ◆ Miscellaneous



0 0.5 Miles

This map was produced by the West Alabama Regional Commission 205 333-2990.
Source: U.S. Census, Census 2000, TIGER Line Files, Lamar County Phone Books, GNIS,
WARC and local jurisdictions. This map is not a survey product and should not be used for conveyance.
Ainfo/Lamar/Towns/Detroit/Social/Public/DetroitCF, March 2009.

Table 5-11:
Town of Detroit
Estimated Loss Protections from Specified Hazards

Natural Hazards	Average Occurrences* (per year)	Total Deaths	Total Injuries	Average Crop and Property Loss* (per event)	Projected Loss* (per event)
Thunderstorm/Wind	2.09	0	0	\$ 40,500	\$ 46,575
Lightning	0	0	0	0	0
Hail	.72	0	0	0	0
Tornado	.09	0	0	\$ 300,000	\$ 345,000
Flood	.27	0	0	0	0
Drought/Extreme Heat	.27	0	0	0	0
Winter Storm/Freeze	.54	0	0	0	0
Hurricane/Tropical Storm	0	0	0	0	0
Sinkhole{Expansive Soils	0	0	0	0	0
Landslide	0	0	0	0	0
Earthquake	0	0	0	0	0
Wildfire	.27	0	0	0	0
Dam/Levee Failure	0	0	0	0	0

Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the 11 year period. Deaths and injuries were taken from the hazard event data. Average loss was calculated by dividing the total amount of all damages by the total number of occurrences during the 11 year period. Projected loss expresses an estimated damage amount per future occurrence by multiplying the average loss figure times 15%.

- Zero denotes no data available to determine the average occurrence average loss or projected loss per event.

Source: NOAA: Alabama Forestry Commission, U.S. Forest Service, Participating Local Jurisdictions

Town Of Detroit Mitigation Action Plan

The Town Of Detroit recognizes the importance of Mitigation Planning and will incorporate Mitigation planning in planning documents as they are revised or initiated.

Mitigation Status

During the plan update mitigation actions were reviewed in Order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. New actions identified during the update planning process have also been added to the plan. Some actions were identified as serving the purpose of preparedness, response, and recovery to an extent that warranted removal from the plan. The hazard planning committee agreed that such actions did not meet the intent of mitigation planning or the eligibility of mitigation grant programs. In order to track the progress of identified actions, the Town of Detroit's original 2005 Mitigation Plan list is shown below. The current status of the proposed actions is shown in Italics.

BENCHMARKING:

Town Of Detroit Mitigation Plan (2005)

Current Projects

- There are no hazard mitigation projects currently underway

Future Projects

1. Add outdoor Warning sirens - Deferred
2. Indoor warning systems for public buildings - Deferred
3. Construct a community storm shelter -Deferred (Needed if Funds are Available)
4. Encourage individual storm shelters - Deferred
5. Upgrade Drainage System - Deferred
6. Develop and Initiate Response System-Deferred
7. Clean out rights-of-way - Deferred
8. Initiate a Fire Prevention Program to educate residents on fire protection - Deferred
9. Upgrade Fire Fighting Equipment - Deferred (Needed if Funds are Available)
10. Become a participant in the NFIP - Revised and Deferred

Table 5-12 shows the Town of Detroit's updated mitigation actions. During the plan update process new actions were identified and added to the plan,

Goals remain the same as the last plan.

Goal 1: Protect life

Objective 1.1: Improve Warning and Emergency Communication Systems

Action 1.1: Install additional outdoor warning sirens

Objective 1.2: Reduce impact of hazards on vulnerable populations

Action I. 2: Construct short-term community Storm Shelter

Action 1.2: Encourage Individual Storm Shelters

Objective 1.3: Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Objective 2.2 Continue Participation in NFIP program

Action 2.2: Enforce floodplain management requirements, regulate construction or improvements in Special Flood Hazard Areas (SFHAs).

Objective 2.3 Provide and maintain essential public services

Objective 2.4 Reduce losses due to drainage problems

Action 2.4: Upgrade drainage systems enlarge ditches, add pipe, and storm drains

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage floodplains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 5-12: Town of Detroit Mitigation Actions

Mitigation Action	Construct short-term Community Storm Shelters with Emergency Generators
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Town of Detroit, Lamar County EMA
Time Frame for Completion	Two Year from Funding Availability
Estimated Cost	\$ 200,000
Funding Sources	Local Grants
Priority	1
Mitigation Action	Encourage Individual Storm Shelters
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Lamar County EMA
Time Frame for Completion	One to two Years from Funding Availability
Estimated Cost	\$250,000
Funding Sources	Grants, Local
Priority	2
Mitigation Action	Install additional outdoor warning sirens
Hazard(s) Addressed	All
Applies to New/Existing Asset	Existing
Local Planning Mechanism	Town of Detroit
Time Frame for Completion	One Year from Funding Availability
Estimated Cost	\$ 20,000
Funding Sources	Grants, Local
Priority	2
Mitigation Action	Upgrade Drainage System to enlarge ditches, add pipe and storm drain
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	Existing
Local Planning Mechanism	Town of Detroit
Time Frame for Completion	One Year from Funding Availability
Estimated Cost	\$ 5,000
Funding Sources	Local Grants
Priority	4
Mitigation Action	Enforce Floodplain Management Requirements, Regulate
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	New and Existing
Local Planning Mechanism	Town of Detroit
Time Frame for Completion	Continuous
Estimated Cost	\$100,000
Funding Sources	Local
Priority	1

Town of Kennedy

**Table 5-13:
Town of Kennedy
Risk and Vulnerability Overview**

Natural Hazards	Hazard Identification	Prioritized Threat	Vulnerability
Thunderstorm/Wind	X	2	H
Lightning	X	6	H
Hail	X	7	M
Tornado	X	3	H
Flood	X	4	L
Drought/Extreme Heat	X	8	H
Winter Storm	X	1	M
Hurricane/Tropical Storm	X	9	H
Sinkhole/Expansive Soils	N/A	N/A	N/A
Landslide	N/A	N/A	N/A
Earthquake	X	10	L
Wildfire	X	5	M
Dam/Levee Failure	N/A	N/A	N/A
KEY Hazard Identification X = Affects the Jurisdiction , N/A = Not a threat to the jurisdiction Priority: Hazards are prioritized with the highest threat assigned number one. Vulnerability: NA = Not Applicable; not hazard to the Jurisdiction N = Low Risk, Little damage potential (damage to less than 5% of the jurisdiction.) M = Medium Risk, Moderate damage potential (damage to 5-10% of the jurisdiction, infrequent occurrence) H = High Risk, significant risk/ major damage potential (damage to over 10% of jurisdiction, regular occurrence)			
Source: Participating Jurisdictions			

Table 5-14: Town of Kennedy Hazard Events
All Hazards January 1, 2004 - December 31, 2015

Location	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage	Total cost	Comments
Kennedy	07/04/2004	Thunderstorm/Wind	50 knots			\$ 4,000		\$ 4,000	
Kennedy	09/25/2005	Tornado	F-1			\$70,000		\$70,000	
Kennedy	03/13/2006	Tornado	F-0			\$20,000		\$20,000	
Kennedy	08/24/2007	Thunderstorm/Wind	50 knots			\$2,000		\$2,000	
Kennedy	08/25/2007	Thunderstorm/Wind	50 knots			\$3,000		\$3,000	
Kennedy	05/08/2008	Thunderstorm/Wind	50 knots			\$3,000		\$3,000	
Kennedy	02/27/2009	Thunderstorm/Wind	50 knots			\$2,000		\$2,000	
Kennedy	03/26/2009	Tornado	EF-1			\$10,000		\$10,000	
Kennedy	08/20/2009	Flash Flood							
Kennedy	10/09/2009	Thunderstorm/Wind	50 knots			\$1,000		\$1,000	
Kennedy	04/04/2011	Flash Flood							
Kennedy	03/02/2012	Thunderstorm/Wind	50 Knots						
Kennedy	07/05/2012	Thunderstorm/Wind	50 Knots						
Kennedy	06/07/2014	Thunderstorm/Wind	50 Knots						
Totals		14		0	0	\$115,000	\$ 0	\$115,000	

Source: National Climatic Data Center

Wildfires **January 1, 2004 - December 31, 2015**

Source: Alabama Forestry Commission and the U.S. Forest Service

Location	Date	Type	Acres	Deaths	Injuries	Property Damage	Crop Damage	Total Cost	Comments
Kennedy	2/14/2011	Wildfire	20						
Totals		1	20	0	0	\$ 0	\$ 0	\$ 0	

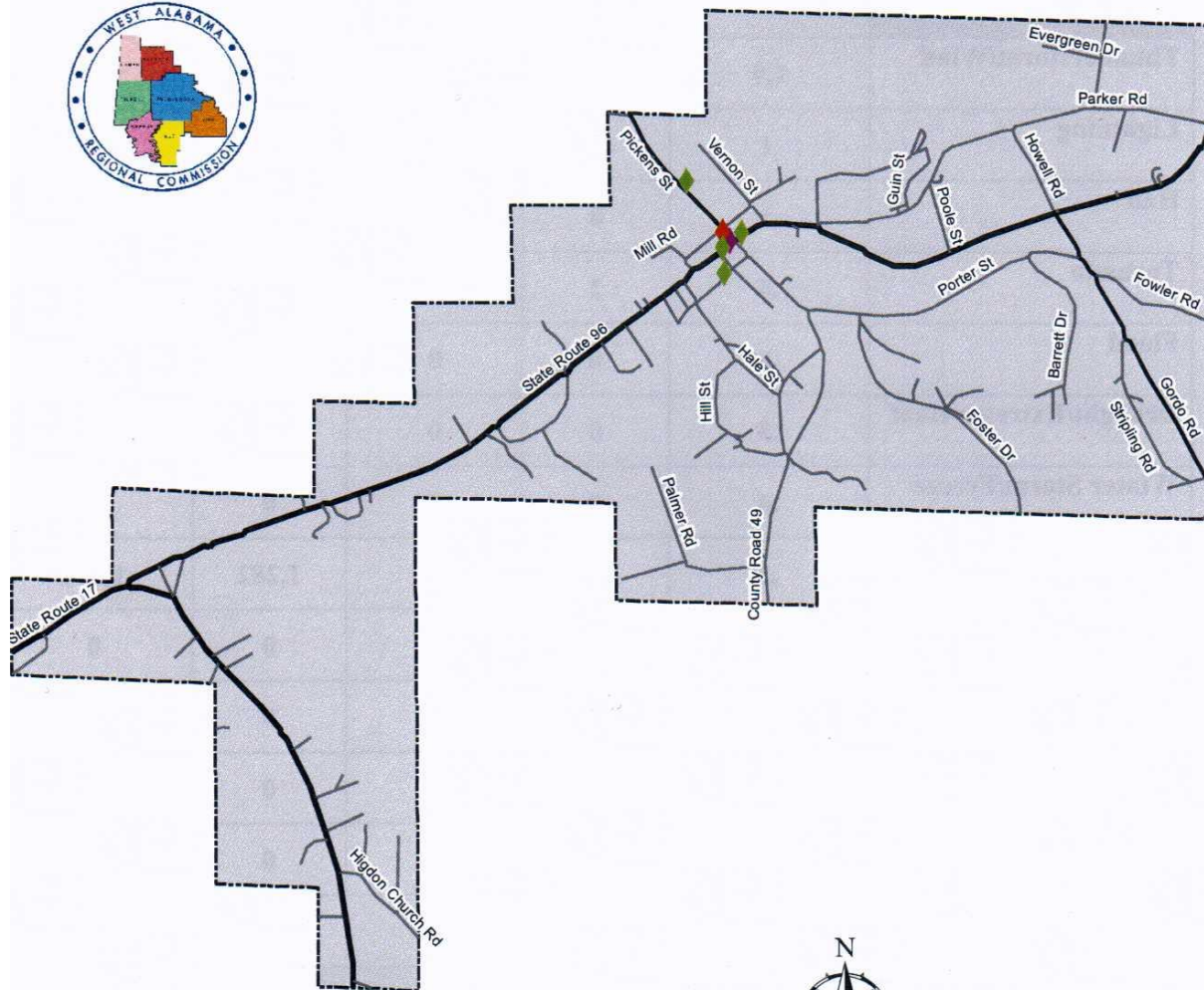
Source: Alabama Forestry Commission

<p style="text-align: center;">Table 5-15: Town of Kennedy Hazard Probability Assessment</p>				
Natural Hazards	Number of Historical Occurrences*	Probability of Future Occurrence*	Extent*	Area Affected
Thunderstorm/Wind	9	0.002%	>10%	Town-wide
Lightning	0	0.0%	>10%	Town-wide
Hail	0	0.0%	5-10%	Town-wide
Tornado	3	0.0006%	5-10%	Town-wide
Flood	2	0.0004%	>5%	North of AL. Hwy. 96
Drought/Extreme Heat	3	0.0006%	5-10%	Town-wide
Winter Storm	6	0.07%	5-10%	Town-wide
Hurricane/Tropical Storm	3	0.0006%	<10%	Town-wide
Sinkhole/Expansive Soils	0	0	0	N/A
Landslide	0	0	0	N/A
Earthquake	0	0	0	N/A
Wildfire	1	0.09%	>10%	Town-wide
Dam/Levee Failure	0	0	0	N/A
<p>Methodology: Number Of historical occurrences is events reported by all sources during the 11 year period of January 1, 2004 — December 31, 2015. Probability is expressed as a percentage Of the chance of an event occurring on any day by dividing the number of historical events by 4,384 (days in the 11 year period). Extent is expressed as the percentage assigned by the jurisdiction's ranking in the vulnerability summary (Table 4-9).</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the probability, extent, or affected area. 				
Source: NOAA: Alabama Forestry Commission, U.S. Forest Service, Participating Local Jurisdictions				

Table 5-16: Town of Kennedy Critical Facilities

Facilities	Location	Use	Values
Governmental Services			
Kennedy Town Hall	17887 Hwy. 96	Local Government	\$ 150,000
Kennedy Fire Department	17887 Hwy. 96	Fire Protection	\$ 510,000
Public Works			
Water Treatment Plant	199 Waterworks Circle	Water System	\$ 2,000,000
Water Tank # 1	3135 County Road 49	Potable Water	\$ 300,000
Water Tank # 2	411 Water Tank Hill Road	Potable Water	\$ 300,000
Sewer Pumping Station	180 Project Street	Sanitary Sewer System	\$ 115,000
Sewer Pumping Station	4476 County Road 49	Sanitary Sewer System	\$ 115,000
Education			
Industrial			
Miscellaneous			
Communications Tower	3400 Mt. Pleasant Church Road	Communications	\$ 100,000
West Al Bank and Trust	17939 Hwy. 96	Financial	\$ 80,000
Shelter	17885 Hwy. 96	Severe Weather	\$ 100,000
Community Center	208 Pike Street	Senior Center	\$ 150,000
Community Center/Ag	4465 County Road 49	Community Programs	\$ 100,000
Gymnasium	County Road 49	Utility Storage	\$ 75,000
Outdoor Warning Siren	17885 Hwy. 96	Severe Weather	\$ 15,000
Warehouse	County Road 49	Utilities Storage	\$ 40,000
Source Local Jurisdictions		Total	\$ 4,150,000

MAP 5-3: TOWN OF KENNEDY CRITICAL FACILITIES



- ◆ Government
- ◆ Fire Department
- ◆ Medical
- ◆ Education
- ◆ Industrial
- ◆ Miscellaneous



0 1 Miles

This map was produced by the West Alabama Regional Commission 205 333-2990.
Source: U.S. Census, Census 2000, TIGER Line Files, Lamar County Phone Books, GNIS,
WARC and local jurisdictions. This map is not a survey product and should not be used for conveyance.
Ainfo/Lamar/Towns/Kennedy/Social/Public/KennedyCF, March 2009

Table 5-17:
Town of Kennedy
Estimated Loss Protections from Specified Hazards

Natural Hazards	Average Occurrences* (per year)	Total Deaths	Total Injuries	Average Crop and Property Loss* (per event)	Projected Loss* (per event)
Thunderstorm/Wind	.81	0	0	\$ 15,000	\$ 17,250
Lightning	0	0	0	0	0
Hail	0	0	0	0	0
Tornado	.27	0	0	\$ 100,000	\$ 115,000
Flood	.18	0	0	0	0
Drought/Extreme Heat	.27	0	0	0	0
Winter Storm/Freeze	.54	0	0	0	0
Hurricane/Tropical	.27	0	0	0	0
Sinkhole/Expansive Soils	0	0	0	0	0
Landslide	0	0	0	0	0
Earthquake	0	0	0	0	0
Wildfire	.09	0	0	0	0
Dam/Levee Failure	0	0	0	0	0
<p>Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the 11 year period. Deaths and injuries were taken from the hazard event data. Average loss was calculated by dividing the total amount of all damages by the total number of occurrences during the 11 year period. Projected loss expresses an estimated damage amount per future occurrence by multiplying the average loss figure times 15%.</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the average occurrence average loss or projected loss per event. 					
Source: NOAA: Alabama Forestry Commission, U.S. Forest Service, Participating Local Jurisdictions					

Town Of Kennedy Mitigation Action Plan

The Town Of Kennedy recognizes the importance of Mitigation Planning and will incorporate Mitigation planning in planning documents as they are revised or initiated.

Mitigation Status

During the plan update mitigation actions were reviewed in Order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. New actions identified during the update planning process have also been added to the plan. Some actions were identified as serving the purpose of preparedness, response, and recovery to an extent that warranted removal from the plan. The hazard planning committee agreed that such actions did not meet the intent of mitigation planning or the eligibility of mitigation grant programs. In order to track the progress of identified actions, the Town of Kennedy's original 2005 Mitigation Plan list is shown below. The current status of the proposed actions is shown in Italics.

BENCHMARKING:

Town Of Kennedy Mitigation Plan (2005)

Current Projects

- NFIP participant

Future Projects

1. Add outdoor Warning sirens - Deferred
2. Indoor warning systems for public buildings - Deferred
3. Construct a community storm shelter -Completed and Deferred
4. Encourage individual storm shelters - Deferred
5. Upgrade Drainage System - Deferred
6. Develop and Initiate Response System-Deferred
7. Clean out rights-of-way - Deferred
8. Initiate a Fire Prevention Program to educate residents on fire protection - Deferred
9. Upgrade Fire Fighting Equipment - Deferred

Table 5-18 shows the Town of Kennedy's updated mitigation actions. During the plan update process new actions were identified and added to the plan,

Mitigation Strategy — Town of Kennedy

Goals remain the same as the last plan.

Goal 1: Protect life

Objective 1.1: Improve Warning and Emergency Communication Systems

Action 1.1: Install additional outdoor warning sirens

Objective 1.2: Reduce impact of hazards on vulnerable populations

Action 1.2: Construct short-term community Storm Shelter

Action 1.2: Encourage Individual Storm Shelters

Objective 1.3: Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Objective 2.2 Continue Participation in NFIP program

Action 2.2: Enforce floodplain management requirements, regulate construction or improvements in Special Flood Hazard Areas (SFHAs).

Objective 2.3 Provide and maintain essential public services

Objective 2.4 Reduce losses due to drainage problems

Action 2.4: Upgrade drainage systems enlarge ditches, install pipe, storm drains

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage floodplains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 5-18: Town of Kennedy Mitigation Actions

Mitigation Action	Install additional outdoor warning sirens
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Town of Kennedy, Lamar County EMA
Time Frame for Completion	one Year from Funding Availability
Estimated Cost	\$ 25,000 each
Funding Sources	Local Grants
Priority	1
Mitigation Action	Upgrade Drainage System to enlarge ditches, add pipe and storm drain
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	Existing
Local Planning Mechanism	Town of Kennedy
Time Frame for Completion	One Year from Funding Availability
Estimated Cost	\$ 60,000
Funding Sources	Local Grants
Priority	2
Mitigation Action	Enforce Floodplain Management Requirements, Regulate Construction or Improvements in Special Flood Hazard Areas (SFHA's)
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	New and Existing
Local Planning Mechanism	Town of Kennedy
Time Frame for Completion	Continuous
Estimated Cost	\$100,000
Funding Sources	Local
Priority	1
Mitigation Action	Encourage Individual Storm Shelters
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Lamar County EMA
Time Frame for Completion	One to two Years from Funding Availability
Estimated Cost	\$ 4,500
Funding Sources	Local Grants
Priority	2

Town of Millport

**Table 5-19:
Town of Millport
Risk and Vulnerability Overview**

Natural Hazards	Hazard Identification	Prioritized Threat	Vulnerability
Thunderstorm/Wind	X	3	H
Lightning	X	6	H
Hail	X	7	L
Tornado	X	2	H
Flood	X	4	L
Drought/Extreme Heat	X	8	M
Winter Storm	X	1	H
Hurricane/Tropical Storm	X	9	H
Sinkhole/Expansive Soils	N/A	N/A	N/A
Landslide	N/A	N/A	N/A
Earthquake	X	10	L
Wildfire	X	5	H
Dam/Levee Failure	N/A	N/A	N/A
KEY Hazard Identification X = Affects the Jurisdiction , N/A = Not a threat to the jurisdiction Priority: Hazards are prioritized with the highest threat assigned number one. Vulnerability: NA = Not Applicable; not hazard to the Jurisdiction O = Low Risk, Little damage potential (damage to less than 5% of the jurisdiction.) M = Medium Risk, Moderate damage potential (damage to 5-10% of the jurisdiction, infrequent occurrence) H = High Risk, significant risk/ major damage potential(damage to over 10% of jurisdiction, regular occurrence)			
Source: Participating Jurisdictions			

Table 5-20: Town of Millport Hazard Events
All Hazards January 1, 2004 - December 31, 2015

Location	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage	Total cost	Comments
Millport	09/12/2004	Hail	.88"						
Millport	10/02/2004	Thunderstorm/Wind	50 knots			\$2,000		\$2,000	
Millport	12/07/2004	Tornado	F-2			\$30,000		\$30,000	
Millport	04/30/2005	Thunderstorm/Wind	52 Knots			\$13,000		\$13,000	
Millport	06/21/2006	Thunderstorm/Wind	50 knots			\$2,000		\$2,000	
Millport	07/18/2006	Thunderstorm/Wind	50 knots			\$1,000		\$1,000	
Millport	07/18/2006	Thunderstorm/Wind	60 knots			\$10,000		\$10,000	
Millport	07/18/2006	Hail	1.00"						
Millport	01/05/2007	Thunderstorm/Wind	50 knots			\$2,000		\$2,000	
Millport	01/05/2007	Thunderstorm/Wind	50 knots			\$2,000		\$2,000	
Millport	11/13/2007	Thunderstorm/Wind	50 knots			\$2,000		\$2,000	
Millport	01/08/2008	Hail	1.00"						
Millport	03/14/2008	Hail	1.75"						
Millport	08/07/2008	Thunderstorm/Wind	50 Knots			\$1,000		\$1,000	
Millport	05/28/2010	Hail	.88"						
Millport	03/09/2011	Flash Flood							
Millport	04/27/2011	Thunderstorm/Wind	60 Knots			\$2,000		\$2,000	
Millport	03/02/2012	Hail	1.75"						
Millport	03/18/2013	Thunderstorm/Wind	55 Knots						
Millport	06/07/2014	Thunderstorm/Wind	50 Knots						
Millport	03/31/2015	Hail	1.00"						
Millport	05/24/2015	Thunderstorm/Wind	50 Knots						
Totals		22		0	0	\$67,000	0	\$67,000	

Source: National Climatic Data Center

Wildfires **January 1, 2004 - December 31, 2015**

Location	Date	Type	Acres	Deaths	Injuries	Property Damage	Crop Damage	Total Cost	Comments
Millport	3/19/2012	Railroad	93						
Millport	7/22/2015	Unknown	27						
Totals		2	120	0	0	\$ 0	\$ 0	\$ 0	

Source: Alabama Forestry Commission

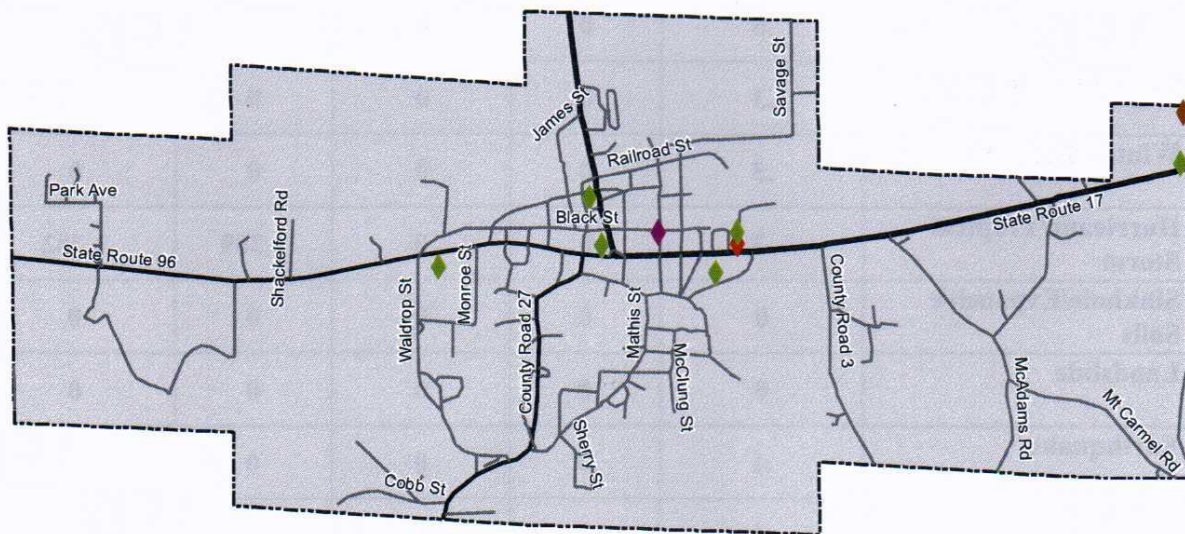
<p>Table 5-21: Town of Millport Hazard Probability Assessment</p>				
Natural Hazards	Number of Historical Occurrences*	Probability of Future Occurrence*	Extent*	Area Affected
Thunderstorm/Wind	13	0.003%	>10%	Town-wide
Lightning	0	0.0%	>10%	Town-wide
Hail	7	0.002%	>5%	Town-wide
Tornado	1	0.0002%	>10%	Town-wide
Flood	1	0.0002%	>5%	North of Railroad, along driver, propst creeks
Drought/Extreme Heat	3	0.0006%	5-10%	Town-wide
Winter Storm	6	0.001%	>10%	Town-wide
Hurricane/Tropical Storm	3	0.0006%	>10%	Town-wide
Sinkhole/Expansive Soils	0	0	0	N/A
Landslide	0	0	0	N/A
Earthquake	0	0	0	N/A
Wildfire	2	0.0004%	>10%	Town-wide
Dam/Levee Failure	0	0	0	N/A
<p>Methodology: Number Of historical occurrences is events reported by all sources during the 11 year period of January 1, 2004 — December 31, 2015. Probability is expressed as a percentage Of the chance of an event occurring on any day by dividing the number of historical events by 4,384 (days in the 11 year period). Extent is expressed as the percentage assigned by the jurisdiction's ranking in the vulnerability summary (Table 4-9).</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the probability, extent, or affected area. 				
Source: NOAA: Alabama Forestry Commission, U.S. Forest Service, Participating Local Jurisdictions				

Table 5-22: Town of Millport Critical Facilities

Facilities	Location	Use	Values
Governmental Services			
Millport Town Hall	920 Black Street	Local Government	\$ 2,000,000
Millport Fire Department	175 Millport Manor Drive	Fire Protection	\$ 500,000
Public Works			
Water Tank # 1 (100K Gal.)	106 Water Tank Road	Potable Water	\$ 300,000
Water Tank # 2 (140K Gal.)	182 Sherry Street	Potable Water	\$ 300,000
Water Tank # 3 (300K Gal.)	565 County Road 3	Potable Water	\$ 300,000
Water Treatment Facility	342 Margaret Street	Potable Water	\$ 2,000,000
Sewer Pumping Station	156 College Drive	Sewer System	\$ 240,000
Sewer Pumping Station	11134 Hwy. 96	Sewer System	\$ 45,000
Sewer Pumping Station	143 Old Kennedy Road	Sewer System	\$ 45,000
Sewer Pumping Station	241 Driver Street	Sewer System	\$ 45,000
Sewer Pumping Station	191 Sands Street	Sewer System	\$ 45,000
Sewer Pumping Station	154 Chickasaw Street	Sewer System	\$ 45,000
Sewer Pumping Station	293 Neal Street	Sewer System	\$ 45,000
Sewer Pumping Station	204 Sally Street	Sewer System	\$ 45,000
Sewer Pumping Station	303 Cobb Street	Sewer System	\$ 45,000
Sewer Pumping Station	136 Gardner Street	Sewer System	\$ 45,000
Sewer Pumping Station	240 Millport Manor Drive	Sewer System	\$ 45,000
Sewer Pumping Station	305 S. Lamar School Drive	Sewer System	\$ 45,000
Sewer Pumping Station	14715 Hwy. 96 East	Sewer System	\$ 45,000
Millport Lagoon	Hwy. 96 East	Sewer System	\$ 615,000
Water Booster Pump	307 County Road 27	Potable Water	\$ 12,700
Well Pump	532 Elizabeth Street	Potable Water	\$ 5,300
Water System Office/Shop	302 Margaret Street	Water Supply	\$ 61,000
Education			
South Lamar School	300 SLS Road	Education	\$ 14,000,000
Industrial			
Steel Dust Recycling	Hwy. 96	Major Employer	\$ 35,000,000

Miscellaneous			
Communications Tower	14026 Hwy. 96	Communications	\$ 100,000
Communication Tower	175 Millport Manor Drive	Communications	\$ 100,000
Communication Tower	288 Cash Circle	Communications	\$ 100,000
West Alabama Bank and Trust	30330 Hwy. 17	Financial	\$ 1,000,000
Old National Guard Armory	455 S. Lamar School Road	Community Functions	\$ 2,000,000
South Lamar Family Medical Center	16530 Hwy. 96	Health Care	\$ 1,000,000
Frontier Communications	11690 Hwy. 96	Financial	\$ 1,000,000
Outdoor Warning Siren # 4	Welsh Street	Weather Warning	\$ 15,000
Outdoor Warning Siren # 5	Sherry Street	Weather Warning	\$ 15,000
Outdoor Warning Siren # 6	Old Kennedy Road	Weather Warning	\$ 15,000
Housing Authority Storm Shelter # 1	12080 Hwy. 96	Shelter	\$ 83,700
Housing Authority Storm Shelter # 2	11132 Hwy. 96	Shelter	\$ 41,100
Source Local Jurisdictions		Total	\$ 60,343,800

MAP 5-4: TOWN OF MILLPORT CRITICAL FACILITIES



- ◆ Government
- ◆ Fire Department
- ◆ Medical
- ◆ Education
- ◆ Industrial
- ◆ Miscellaneous



0 1.6 Miles

This map was produced by the West Alabama Regional Commission 205 333-2990.
Source: U.S. Census, Census 2000, TIGER Line Files, Lamar County Phone Books, GNIS,
WARC and local jurisdictions. This map is not a survey product and should not be used for conveyance.
Ainfo/Lamar/Towns/Millport/Social/Public/MillportCF, March 2009

Table 5-23:
Town of Millport
Estimated Loss Protections from Specified Hazards

Natural Hazards	Average Occurrences* (per year)	Total Deaths	Total Injuries	Average Crop and Property Loss* (per event)	Projected Loss* (per event)
Thunderstorm/Wind	1.18	0	0	\$ 37,000	\$ 42,550
Lightning	0	0	0	0	0
Hail	.63	0	0	0	0
Tornado	.09	0	0	\$ 30,000	\$ 34,500
Flood	.09	0	0	0	0
Drought/Extreme Heat	.27	0	0	0	0
Winter Storm/Freeze	.54	0	0	0	0
Hurricane/Tropical	.27	0	0	0	0
Sinkhole/Expansive Soils	0	0	0	0	0
Landslide	0	0	0	0	0
Earthquake	0	0	0	0	0
Wildfire	.18	0	0	0	0
Dam/Levee Failure	0	0	0	0	0
<p>Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the 11 year period. Deaths and injuries were taken from the hazard event data. Average loss was calculated by dividing the total amount of all damages by the total number of occurrences during the 11 year period. Projected loss expresses an estimated damage amount per future occurrence by multiplying the average loss figure times 15%.</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the average occurrence average loss or projected loss prevention. 					
Source: NOAA: Alabama Forestry Commission, U.S. Forest Service, Participating Local Jurisdictions					

Town Of Millport Mitigation Action Plan

The Town Of Millport recognizes the importance of Mitigation Planning and will incorporate Mitigation planning in planning documents as they are revised or initiated.

Mitigation Status

During the plan update mitigation actions were reviewed in Order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. New actions identified during the update planning process have also been added to the plan. Some actions were identified as serving the purpose of preparedness, response, and recovery to an extent that warranted removal from the plan. The hazard planning committee agreed that such actions did not meet the intent of mitigation planning or the eligibility of mitigation grant programs. In order to track the progress of identified actions, the Town of Millport's original 2005 Mitigation Plan list is shown below. The current status of the proposed actions is shown in Italics.

BENCHMARKING:

Town Of Millport Mitigation Plan (2005)

Current Projects

- NFIP participant

Future Projects

1. Add outdoor Warning sirens - Deferred
2. Indoor warning systems for public buildings - Deferred
3. Construct a community storm shelter -Completed and Deferred
4. Encourage individual storm shelters - Deferred
5. Upgrade Drainage System - Deferred
6. Develop and Initiate Response System-Deferred
7. Clean out rights-of-way - Completed
8. Initiate a Fire Prevention Program to educate residents on fire protection - Deferred
9. Upgrade Fire Fighting Equipment - Completed

Table 5-24 shows the Town of Millport's updated mitigation actions. During the plan update process new actions were identified and added to the plan,

Mitigation Strategy — Town of Millport

Goals remain the same as the last plan.

Goal 1: Protect life

Objective 1.1: Improve Warning and Emergency Communication Systems

Action 1.1: Install additional outdoor warning sirens

Objective 1.2: Reduce impact of hazards on vulnerable populations

Action 1.2: Construct short-term community Storm Shelter

Action 1.2: Encourage Individual Storm Shelters

Objective 1.3: Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Objective 2.2 Continue Participation in NFIP program

Action 2.2: Enforce floodplain management requirements, regulate construction or improvements in Special Flood Hazard Areas (SFHAs).

Objective 2.3 Provide and maintain essential public services

Objective 2.4 Reduce losses due to drainage problems

Action 2.4: Upgrade drainage systems enlarge ditches, install culverts

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage floodplains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 5-24: Town of Millport Mitigation Actions

Mitigation Action	Construct short-term Community Storm Shelter
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Town of Millport, Lamar County EMA
Time Frame for Completion	one Year from Funding Availability
Estimated Cost	\$ 400,000
Funding Sources	Local Grants
Priority	1
Mitigation Action	Install Additional outdoor warning sirens
Hazard(s) Addressed	All
Applies to New/Existing Asset	Existing
Local Planning Mechanism	Town of Millport
Time Frame for Completion	One Year from Funding Availability
Estimated Cost	\$ 25,000 each
Funding Sources	Local Grants
Priority	2
Mitigation Action	Upgrade Drainage System to enlarge ditches and culverts
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	New and Existing
Local Planning Mechanism	Town of Millport, Public Works
Time Frame for Completion	One Year from funding Availability
Estimated Cost	\$ 2,000,000
Funding Sources	Local, Grants
Priority	2
Mitigation Action	Enforce Floodplain Management Requirements: Regulate Construction or improvements in Special Flood Hazard Areas (SFHA's)
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	New and Existing
Local Planning Mechanism	Town of Millport
Time Frame for Completion	Continuous
Estimated Cost	\$100,000
Funding Sources	Local
Priority	1
Mitigation Action	Encourage Individual Storm Shelters
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Lamar County EMA
Time Frame for Completion	One to Two Years from Funding Availability
Estimated Cost	\$ 4,500 each
Funding Sources	Grants, Local
Priority	2

City of Sulligent

**Table 5-25:
City of Sulligent
Risk and Vulnerability Overview**

Natural Hazards	Hazard Identification	Prioritized Threat	Vulnerability
Thunderstorm/Wind	X	1	H
Lightning	X	2	H
Hail	X	7	M
Tornado	X	4	H
Flood	X	6	H
Drought/Extreme Heat	X	5	H
Winter Storm	X	3	H
Hurricane/Tropical Storm	X	9	M
Sinkhole/Expansive Soils	N/A	N/A	N/A
Landslide	N/A	N/A	N/A
Earthquake	X	10	L
Wildfire	X	8	H
Dam/Levee Failure	N/A	N/A	N/A
KEY Hazard Identification X = Affects the Jurisdiction , N/A = Not a threat to the jurisdiction Priority: Hazards are prioritized with the highest threat assigned number one. Vulnerability: NA = Not Applicable; not hazard to the Jurisdiction P = Low Risk, Little damage potential (damage to less than 5% of the jurisdiction.) M = Medium Risk, Moderate damage potential (damage to 5-10% of the jurisdiction, infrequent occurrence) H = High Risk, significant risk/ major damage potential (damage to over 10% of jurisdiction, regular occurrence)			
Source: Participating Jurisdictions			

Table 5-26: City of Sulligent Hazard Events
All Hazards January 1, 2004 - December 31, 2015

Location	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage	Total cost	Comments
Sulligent	04/21/2005	Hail	1.25"			\$ 1,000		\$1,000	
Sulligent	04/21/2005	Hail	1.75"			\$ 9,000		\$9,000	
Sulligent	07/20/2005	Thunderstorm/Wind	52 Knots			\$ 2,000		\$2,000	
Sulligent	07/20/2005	Lightning			1				
Sulligent	07/20/2005	Flash Flood				\$1,000		\$1,000	
Sulligent	03/13/2006	Tornado	F-0			\$6,000		\$6,000	
Sulligent	05/10/2006	Hail	.75"						
Sulligent	11/15/2006	Thunderstorm/Wind	50 Knots			\$1,000		\$1,000	
Sulligent	02/24/2007	Flash Flood							
Totals		9		0	1	\$20,000	\$ 0	\$20,000	

Source: National Climatic Data Center

Wildfires January 1, 2004 - December 31, 2015

Source: Alabama Forestry Commission and the U.S. Forest Service

Location	Date	Type	Acres	Deaths	Injuries	Property Damage	Crop Damage	Total Cost	Comments
Sulligent	3/20/2013	Wildfire	75						
Totals		1	75	0	0	\$ 0	\$ 0	\$ 0	

There was no Local Input

**Table 5-27:
City of Sulligent
Hazard Probability Assessment**

Natural Hazards	Number of Historical Occurrences*	Probability of Future Occurrence*	Extent*	Area Affected
Thunderstorm/Wind	2	0.0004%	>10%	City-wide
Lightning	1	0.0002%	>10%	City-wide
Hail	3	0.0006%	5-10%	City-wide
Tornado	1	0.0002%	>10%	City-wide
Flood	2	0.0004%	>10%	Northern Areas
Drought/Extreme Heat	3	0.0006%	>10%	City-wide
Winter Storm	6	0.001%	>10%	City-wide
Hurricane/Tropical Storm	3	0.0006%	5-10%	City-wide
Sinkhole/Expansive Soils	0	0	0	N/A
Landslide	0	0	0	N/A
Earthquake	0	0	0	N/A
Wildfire	1	0.0002%	>10%	City-wide
Dam/Levee Failure	0	0	0	N/A

Methodology: Number Of historical occurrences is events reported by all sources during the 11 year period of January 1, 2004 — December 31, 2015. Probability is expressed as a percentage Of the chance of an event occurring on any day by dividing the number of historical events by 4,384 (days in the 11 year period). Extent is expressed as the percentage assigned by the jurisdiction's ranking in the vulnerability summary (Table 4-9).

- Zero denotes no data available to determine the probability, extent, or affected area.

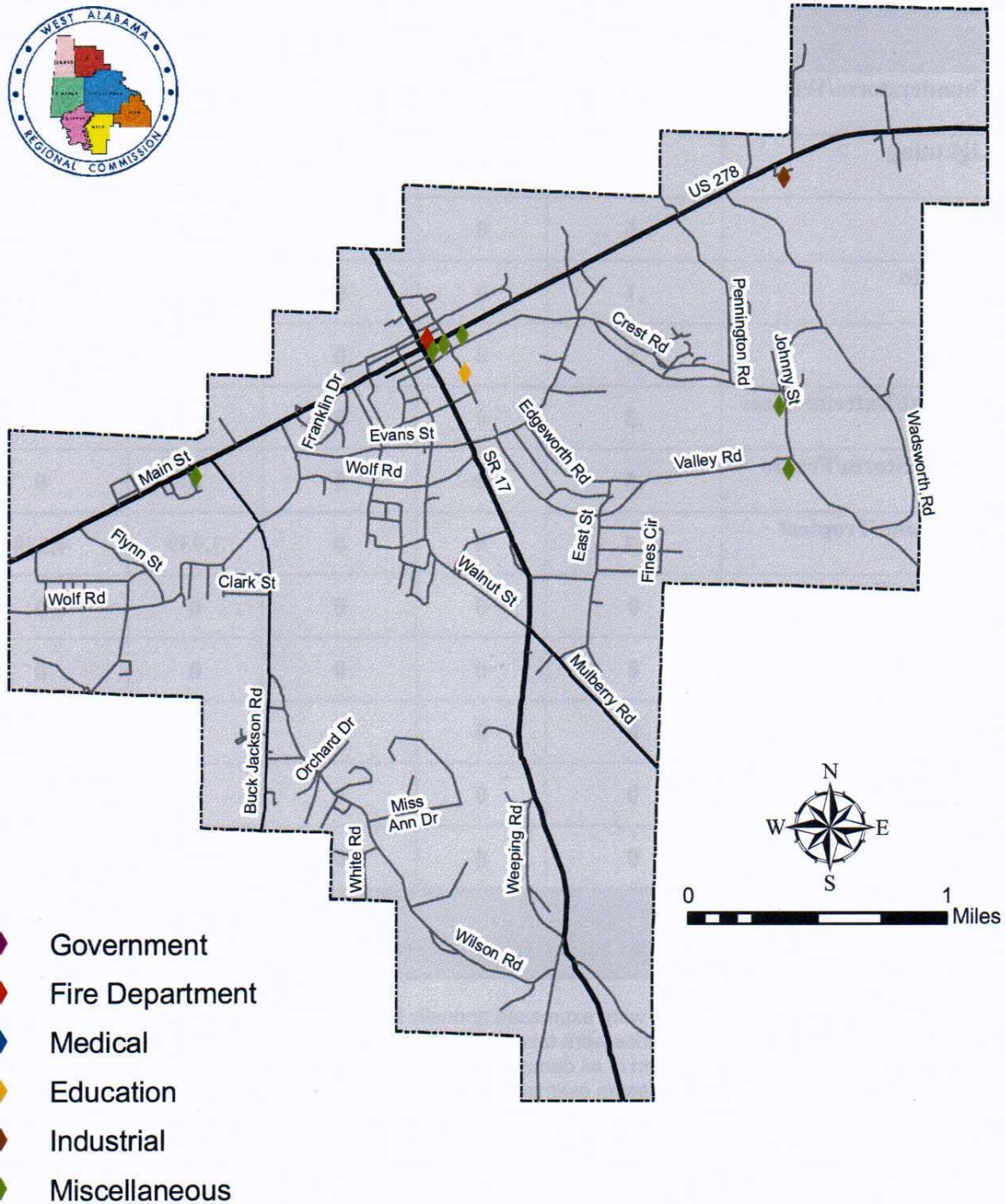
Source: NOAA: Alabama Forestry Commission, U.S. Forest Service, Participating Local Jurisdictions

Table 5-28: City of Sulligent Critical Facilities

Facilities	Location	Use	Values
Governmental Services			
Sulligent City Hall/Fire/Police	5795 Hwy. 278	Local Government	\$ 1,300,000
Public Works			
Ogden Hill Water Tank	155 Lollar Street	Potable Water	\$ 300,000
Wadsworth Water Tank	2105 Wadsworth Road	Potable Water	\$ 300,000
Ogden Hill Well	155 Lollar Street	Water Supply	
Brown Street Pump House	664 Brown street	Water Supply	\$ 200,000
Sewer Treatment Plant	210 Treatment Plant Road	Sewer Treatment	\$ 750,000
Sewer Pumping Station # 1	Hwy. 278 West	Sewer System	\$ 125,000
Sewer Pumping Station # 2	Northem Estates	Sewer System	\$ 60,000
Sewer Pumping Station # 3	Wolf Run	Sewer System	\$ 50,000
Sewer Pumping Station # 4	Metcalf Street	Sewer System	\$ 50,000
Sewer Pumping Station # 5	Trim Trailer Park Circle	Sewer System	\$ 40,000
Sewer Pumping Station # 6	Mulberry Road	Sewer System	\$ 50,000
Sewer Pumping Station # 7	Mulberry Road	Sewer System	\$ 40,000
Sewer Pumping Station # 8	Hwy. 278 East Omni	Sewer System	\$ 50,000
Sewer Pumping Station # 9	Hwy. 278 East Allen White Plant	Sewer System	\$ 60,000
Sewer Pumping Station # 10	Hwy. 278 East Hyster-Yale Plant	Sewer System	\$ 80,000
Sewer Pumping Station # 11	Waterworks Road	Sewer System	\$ 4,000
Sewer Pumping Station # 12	Mulberry Road	Sewer System	\$ 4,000
Education			
Sulligent K-12	661 Elm Street	Education	\$ 10,000,000
Industrial			
Hyster-Yale Material Handling	7711 Hwy. 278	Major Employer	
Max Homes	8008 Hwy 278	Major Employer	\$ 3,000,000
Hyster-Yale Material Handling	7668 Hwy. 278	Major Employer	\$ 2,000,000
Glenn Manufacturing	5484 Hwy. 278	Major Employer	\$ 1,000,000

Miscellaneous			
Communications Tower	1975 Wadsworth Road	Communications	\$ 100,000
Communication Tower	2105 Wadsworth Road	Communications	\$ 100,000
First National Bank	55220 Hwy. 17	Financial	\$ 500,000
First State Bank	5856 Hwy. 278	Financial	\$ 500,000
National Guard Armory	4745 Hwy. 278	Military Facility	\$ 1,000,000
Rescue Squad Building	5795 Hwy. 278	EMS	\$ 300,000
Outdoor Warning Siren # 7	Wadsworth Road	Weather Warning	\$ 15,000
Outdoor Warning Siren # 8	Hwy 17 Ogden Hill	Weather Warning	\$ 15,000
Outdoor Warning Siren # 9	Humber/Wolf Road	Weather Warning	\$ 15,000
Outdoor Warning Siren # 10	Hwy. 278 East	Weather Warning	\$ 15,000
Outdoor Warning Siren # 14	Miss Anne Drive	Weather Warning	\$ 15,000
Source Local Jurisdictions		Total	\$ 22,038,000

MAP 5-5: CITY OF SULLIGENT CRITICAL FACILITIES



This map was produced by the West Alabama Regional Commission 205 333-2990.
Source: U.S. Census, Census 2000, TIGER Line Files, Lamar County Phone Books, GNIS,
WARC and local jurisdictions. This map is not a survey product and should not be used for conveyance.
Ainfo/Lamar/Towns/SulligentSocial/Public/SulligentCF, March 2009.

Table 5-29:
City of Sulligent
Estimated Loss Protections from Specified Hazards

Natural Hazards	Average Occurrences* (per year)	Total Deaths	Total Injuries	Average Crop and Property Loss* (per event)	Projected Loss* (per event)
Thunderstorm/Wind	.18	0	0	\$ 3,000	\$ 3,450
Lightning	.09	0	1	0	0
Hail	.15	0	0	\$ 10,000	\$ 11,500
Tornado	.09	0	0	\$ 6,000	\$ 6,900
Flood	.18	0	0	\$ 1,000	\$ 1,150
Drought/Extreme Heat	.27	0	0	0	0
Winter Storm/Freeze	.54	0	0	0	0
Hurricane/Tropical	.27	0	0	0	0
Sinkhole/Expansive Soils	0	0	0	0	0
Landslide	0	0	0	0	0
Earthquake	0	0	0	0	0
Wildfire	.09	0	0	0	0
Dam/Levee Failure	0	0	0	0	0
<p>Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the 11 year period. Deaths and injuries were taken from the hazard event data. Average loss was calculated by dividing the total amount of all damages by the total number of occurrences during the 11 year period. Projected loss expresses an estimated damage amount per future occurrence by multiplying the average loss figure times 15%.</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the average occurrence average loss or projected loss per event. 					
Source: NOAA: Alabama Forestry Commission, U.S. Forest Service, Participating Local Jurisdictions					

City Of Sulligent Mitigation Action Plan

The City Of Sulligent recognizes the importance of Mitigation Planning and will incorporate Mitigation planning in planning documents as they are revised or initiated.

Mitigation Status

During the plan update mitigation actions were reviewed in Order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. New actions identified during the update planning process have also been added to the plan. Some actions were identified as serving the purpose of preparedness, response, and recovery to an extent that warranted removal from the plan. The hazard planning committee agreed that such actions did not meet the intent of mitigation planning or the eligibility of mitigation grant programs. In order to track the progress of identified actions, the City of Sulligent's original 2005 Mitigation Plan list is shown below. The current status of the proposed actions is shown in Italics.

BENCHMARKING:

City Of Sulligent Mitigation Plan (2005)

Current Projects

- NFIP participant

Future Projects

1. Add outdoor Warning sirens - Deferred
2. Indoor warning systems for public buildings - Deferred
3. Construct a community storm shelter -Deferred
4. Encourage individual storm shelters - Deferred
5. Upgrade Drainage System - Deferred
6. Develop and Initiate Response System-Deferred
7. Clean out rights-of-way - Deferred
8. Initiate a Fire Prevention Program to educate residents on fire protection - Deferred
9. Upgrade Fire Fighting Equipment - Deferred

Table 5-30 shows the City of Sulligent's updated mitigation actions. During the plan update process new actions were identified and added to the plan,

Goals remain the same as the last plan.

Goal 1: Protect life

Objective 1.1: Improve Warning and Emergency Communication Systems

Action 1.1: Install additional outdoor warning sirens

Objective 1.2: Reduce impact of hazards on vulnerable populations

Action I. 2: Construct short-term community Storm Shelter

Action 1.2: Encourage Individual Storm Shelters

Objective 1.3: Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Objective 2.2 Continue Participation in NFIP program

Action 2.2: Enforce floodplain management requirements, regulate construction or improvements in Special Flood Hazard Areas (SFHAs).

Objective 2.3 Provide and maintain essential public services

Objective 2.4 Reduce losses due to drainage problems

Action 2.4: Upgrade drainage systems

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage floodplains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 5-30: City of Sulligent Mitigation Actions

Mitigation Action	Install additional outdoor warning sirens
Hazard(s) Addressed	All
Applies to New/Existing Asset	Existing
Local Planning Mechanism	City of Sulligent, Lamar County EMA
Time Frame for Completion	one Year from Funding Availability
Estimated Cost	\$ 15,000 each
Funding Sources	Local Grants
Priority	1
Mitigation Action	Upgrade Drainage System
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	Existing
Local Planning Mechanism	City of Sulligent, Public Works
Time Frame for Completion	One Year from Funding Availability
Estimated Cost	\$100,000
Funding Sources	Local Grants
Priority	2
Mitigation Action	Encourage Individual Storm Shelters
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	City of Sulligent, Lamar County EMA
Time Frame for Completion	One Year from funding Availability
Estimated Cost	\$250,000
Funding Sources	Local, Grants
Priority	2
Mitigation Action	Enforce Floodplain Management Requirements: Regulate Construction or improvements in Special Flood Hazard Areas (SFHA's)
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	New and Existing
Local Planning Mechanism	City of Sulligent
Time Frame for Completion	Continuous
Estimated Cost	\$100,000
Funding Sources	Local
Priority	1

City of Vernon

**Table 5-31:
City of Vernon
Risk and Vulnerability Overview**

Natural Hazards	Hazard Identification	Prioritized Threat	Vulnerability
Thunderstorm/Wind	X	2	H
Lightning	X	3	H
Hail	X	8	M
Tornado	X	6	H
Flood	X	5	M
Drought/Extreme Heat	X	4	H
Winter Storm	X	1	H
Hurricane/Tropical Storm	X	9	M
Sinkhole/Expansive Soils	N/A	N/A	N/A
Landslide	N/A	N/A	N/A
Earthquake	X	10	L
Wildfire	X	7	H
Dam/Levee Failure	N/A	N/A	N/A
KEY Hazard Identification X = Affects the Jurisdiction , N/A = Not a threat to the jurisdiction Priority: Hazards are prioritized with the highest threat assigned number one. Vulnerability: NA = Not Applicable; not hazard to the Jurisdiction Q = Low Risk, Little damage potential (damage to less than 5% of the jurisdiction.) M = Medium Risk, Moderate damage potential (damage to 5-10% of the jurisdiction, infrequent occurrence) H = High Risk, significant risk/ major damage potential (damage to over 10% of jurisdiction, regular occurrence)			
Source: Participating Jurisdictions			

Table 5-32: City of Vernon Hazard Events
All Hazards January 1, 2004 - December 31, 2015

Location	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage	Total cost	Comments
Vernon	07/07/2004	Thunderstorm/Wind	50 Knots			\$ 8,000		\$ 8,000	
Vernon	07/31/2004	Lightning				\$ 10,000		\$ 10,000	
Vernon	11/15/2005	Tornado	F-0			\$ 20,000		\$ 20,000	
Vernon	04/07/2006	Thunderstorm/Wind	50 Knots			\$ 2,000		\$ 2,000	
Vernon	04/20/2006	Hail	.75"						
Vernon	05/10/2006	Thunderstorm/Wind	50 Knots			\$ 3,000		\$ 3,000	
Vernon	06/02/2006	Hail	.75"						
Vernon	07/21/2006	Thunderstorm/Wind	50 Knots			\$ 2,000		\$ 2,000	
Vernon	01/05/2007	Thunderstorm/Wind	56 Knots			\$20,000		\$20,000	
Vernon	03/01/2007	Hail	1.00"						
Vernon	10/18/2007	Tornado	EF-0						
Vernon	01/10/2008	Hail	1.00"						
Vernon	01/10/2008	Thunderstorm/Wind	50 Knots		1	\$10,000		\$10,000	
Vernon	04/11/2008	Hail	.75"						
Vernon	05/08/2008	Thunderstorm/Wind	50 Knots			\$3,000		\$3,000	
Vernon	08/07/2008	Thunderstorm/Wind	45 Knots			\$500		\$500	
Vernon	04/10/2009	Hail	1.75"						
Vernon	06/04/2009	Flash Flood							
Vernon	06/12/2009	Hail	.75"						
Vernon	06/12/2009	Thunderstorm/Wind	54 Knots						
Vernon	06/12/2009	Thunderstorm/Wind	55 Knots			\$2,000		\$2,000	
	06/12/2009	Hail	1.00"						
	06/12/2009	Flash Flood							
	09/21/2009	Flash Flood				\$2,000		\$2,000	
	09/26/2009	Flash Flood				\$2,000		\$2,000	
	10/09/2009	Thunderstorm/Wind	39 Knots			\$2,000		\$2,000	
	10/09/2009	Thunderstorm/Wind	50 Knots			\$2,000		\$2,000	
	10/13/2009	Flash Flood				\$5,000		\$5,000	
	12/08/2009	Flash Flood				\$100,000		\$100,000	
	12/24/2009	Flash Flood				\$5,000		\$5,000	
	03/12/2010	Hail	1.75"						
	05/02/2010	Flash Flood							
	05/28/2010	Hail	.88"						
	06/09/2010	Thunderstorm/Wind	55 Knots			\$3,000		\$3,000	
	06/26/2010	Thunderstorm/Wind	50 Knots			\$3,000		\$3,000	
	07/16/2010	Hail	1.00"			\$15,000		\$15,000	
	07/16/2010	Thunderstorm/Wind	60 Knots			\$25,000		\$25,000	
	08/15/2010	Thunderstorm/Wind	60 Knots			\$15,000		\$15,000	
	10/12/2010	Thunderstorm/Wind	55 Knots			\$7,000		\$7,000	
	10/25/2010	Thunderstorm/Wind	60 Knots			\$3,000		\$3,000	
	01/01/2011	Thunderstorm/Wind	50 Knots						
	02/24/2011	Thunderstorm/Wind	65 Knots			\$10,000		\$10,000	
	03/26/2011	Hail	1.00"						
	04/04/2011	Hail	1.75"						
	04/04/2011	Hail	1.00"						
	04/15/2011	Flash Flood							
	04/15/2011	Hail	1.00"						
	04/20/2011	Flash Flood				\$10,000		\$10,000	
	09/05/2011	Flash Flood							
	09/05/2011	Flood							
	03/08/2012	Thunderstorm/Wind	50 Knots						
	03/08/2012	Flash Flood							
	04/05/2012	Thunderstorm/Wind	50 Knots						
	05/06/2012	Hail	.75"						

	05/08/2012	Flash Flood							
	07/27/2012	Thunderstorm/Wind	55 Knots						
	07/27/2012	Flash Flood							
	07/27/2012	Thunderstorm/Wind	50 Knots						
	12/20/2012	Thunderstorm/Wind	55 Knots						
	01/14/2013	Flood							
	03/18/2013	Thunderstorm/Wind	55 Knots						
	08/21/2013	Flash Flood							
	06/09/2014	Thunderstorm/Wind	56 Knots						
	06/09/2014	Thunderstorm/Wind	56 Knots						
	12/23/2014	Flash Flood							
	12/23/2014	Flood							
	01/03/2015	Thunderstorm/Wind	50 Knots						
	05/24/2015	Thunderstorm/Wind	50 Knots						
	07/22/2015	Thunderstorm/Wind	50 Knots						
	07/22/2015	Thunderstorm/Wind	50 Knots						
	07/29/2015	Thunderstorm/Wind	50 Knots						
Totals		71		0	0	\$ 289,500	0	\$289,500	

Source: National Climatic Data Center

Wildfires

January 1, 2004 - December 31, 2015

Source: Alabama Forestry Commission and the U.S. Forest Service

Location	Date	Type	Acres	Deaths	Injuries	Property Damage	Crop Damage	Total Cost	Comments
Vernon	1/25/2005	Miscellaneous	29						
Totals		1	29	0	0	\$ 0	\$ 0	\$ 0	

There was no Local Input

<p>Table 5-33: City of Vernon Hazard Probability Assessment</p>				
Natural Hazards	Number of Historical Occurrences*	Probability of Future Occurrence*	Extent*	Area Affected
Thunderstorm/Wind	33	0.007%	>10%	City-wide
Lightning	1	0.0002%	>10%	City-wide
Hail	16	0.004%	5-10%	City-wide
Tornado	2	0.0005%	>10%	City-wide
Flood	18	0.004%	>10%	City-Wide
Drought/Extreme Heat	3	0.0006%	>10%	City-wide
Winter Storm	6	0.001%	>10%	City-wide
Hurricane/Tropical Storm	3	0.0006%	5-10%	City-wide
Sinkhole/Expansive Soils	0	0	0	N/A
Landslide	0	0	0	N/A
Earthquake	0	0	0	N/A
Wildfire	1	0.0002%	>10%	City-wide
Dam/Levee Failure	0	0	0	N/A
<p>. Methodology: Number Of historical occurrences is events reported by all sources during the 11 year period of January 1, 2004 — December 31, 2015. Probability is expressed as a percentage Of the chance of an event occurring on any day by dividing the number of historical events by 4,384 (days in the 11 year period). Extent is expressed as the percentage assigned by the jurisdiction's ranking in the vulnerability summary (Table 4-9).</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the probability, extent, or affected area. 				
Source: NOAA: Alabama Forestry Commission, U.S. Forest Service, Participating Local Jurisdictions				

Table 5-34: City of Vernon Critical Facilities

Facilities	Location	Use	Values
Governmental Services			
Vernon City Hall	44425 Hwy. 17	Local Government	\$ 500,000
Lamar County Courthouse Annex	44690 Hwy. 17	County Government	15,000,000
Lamar County Judicial Center	44690 Hwy. 17	County Government	\$ 1,000,000
Lamar County EOC/Jail	11180 County Road 9	EOC/Jail	\$ 10,000,000
Vernon Fire & Rescue	152 1st Avenue NW	Fire Protection	\$ 1,000,000
Lamar County Annex	110 1st Avenue NW	Local Government	\$ 1,000,000
Public Works			
Well/Treatment Plant	County Road 9	Potable Water	\$ 1,688,000
Water Tank	14th Circle NE	Potable Water	\$ 300,000
Water Tank	Columbus Avenue	Potable Water	\$ 300,000
Water Tank	Reaves Street	Potable Water	\$ 300,000
Water Booster Pump	Morton Chapel Road	Potable Water	\$ 2,500
Water Booster Pump	Hwy. 17 North	Potable Water	\$ 2,500
Water Booster pump	Beaver Creek Road	Potable Water	\$ 2,500
Vernon Sewer lagoon & Lift Station	1052 County Road 9	Sewer Treatment	\$ 1,250,000
Sewer Lift Station (McNeese)	County Road 9	Sewer System	\$ 100,000
Sewer Lift Station(Harrison Court)	Hwy. 17/County Road 9	Sewer System	\$ 200,000
Sewer Lift Station (Western Auto)	Hwy.17	Sewer System	\$ 30,000
Sewer Lift Station(Green Acres)	Hwy. 17	Sewer System	\$ 30,000
Sewer Lift Station(Hillview Subdivision)	Hwy. 17	Sewer System	\$ 40,000
Education			
Lamar County Vocation/Technical/Alternative	8990 Hwy. 17	Education	\$ 6,000,000
Vernon Elementary School	9700 Hwy. 18	K-3 School	\$ 3,000,000
Vernon Intermediate/High School	480 7th Street	Education	\$ 4,000,000
Board Of Education Office	9600 Hwy. 18	Education office	\$1,000,000

Lamar County Head Start	Behind City Hall	Education	\$500,000
Industrial			
Marathon	County Road 9	Manufacturing	\$ 2,000,000
Omni	Omni Road	Manufacturing	\$ 750,000
Roof Mart	County Road 9	Manufacturing	\$7,000,000
Alabama Automation	County Road 9	Manufacturing	\$ 2,000,000
Trucking Industry	Vernon	Trucking	\$ 10,000,000
Midstates, INC.	Hwy. 18	Fuel	\$1,000,000
Waste Management	Omni Road	Trash Collection	\$ 1,500,000
K & S Lumber	City Industrial Park	Timber	\$1,000,000
C & H Machine	City Industrial Park	Manufacturing	\$ 2,000,000
IWS	Vernon	Prefabrication	\$ 2,000,000
Miscellaneous			
Communications Tower	1116 County Road 9	Communications	\$ 100,000
Communication Tower	2583 Oil Rig Road	Communications	\$ 100,000
Communication Tower	3031 Old Highway 18	Communications	\$ 100,000
Communication Tower	40315 Hwy. 17	Communications	\$ 100,000
Communication Tower	4499 County Road 9	Communications	\$ 100,000
Communication Tower	47654 Hwy. 17	Communications	\$ 100,000
Communication Tower	627 County Road 20	Communications	\$ 100,000
Communication Tower	690 Columbus Avenue NW	Communications	\$ 100,000
Communication Tower	969 Aberdeen Road	Communications	\$ 100,000
Communication Tower	Behind Old Loop	Communications	\$ 100,000
Verizon Telephone System	44732 Hwy. 17	Local Phone Service	\$ 10,000,000
Alabama Power	Across County/Inside Cities	Electricity	\$ 22,330,187
Gas Lines	Across County/Inside Cities	Heating/Fuel	\$ 6,125,000
Tombigbee Electric	Across County/Inside Cities	Electricity	\$ 22,330,187
National Guard Armory	Hwy. 17 South	Military Facility	\$ 250,000
Health Department	Springfield Road	Health Care	\$ 1,750,000
Outdoor Warning Siren # 11	44745 Hwy. 17	Weather Warning	\$ 20,000
Outdoor Warning Siren # 12	690 Columbus Avenue NW	Weather Warning	\$ 20,000
Outdoor Warning Siren # 13	1118 County Road 9	Weather Warning	\$ 20,000
City Shop/Old Armory	650 Columbus Avenue	City Maintenance Shop	\$ 500,000

Lamar County Health Department DHR Building	Springfield Road	Personal Care	\$ 2,000,000
Vernon Clinic	101 Second AV.SW	Healthcare	\$ 750,000
Whatley Healthcare	Hospital Drive	Healthcare	\$ 1,500,000
Lamar Communications	47683	Radio Station	\$ 1,000,000
Source Local Jurisdictions		Total	\$ 120,340,874

Table 5-35:
City of Vernon
Estimated Loss Protections from Specified Hazards

Natural Hazards	Average Occurrences* (per year)	Total Deaths	Total Injuries	Average Crop and Property Loss* (per event)	Projected Loss* (per event)
Thunderstorm/Wind	3	0	1	\$ 120,500	\$ 138,575
Lightning	.09	0	0	\$ 10,000	\$ 11,500
Hail	1.45	0	0	0	0
Tornado	.18	0	0	\$ 20,000	\$ 23,000
Flood	1.64	0	0	\$ 114,000	\$ 131,100
Drought/Extreme Heat	.27	0	0	0	0
Winter Storm/Freeze	.54	0	0	0	0
Hurricane/Tropical	.27	0	0	0	0
Sinkhole/Expansive Soils	0	0	0	0	0
Landslide	0	0	0	0	0
Earthquake	0	0	0	0	0
Wildfire	.09	0	0	0	0
Dam/Levee Failure	0	0	0	0	0
<p>Methodology: Average occurrences were expressed annually by dividing the total number of occurrences by the 11 year period. Deaths and injuries were taken from the hazard event data. Average loss was calculated by dividing the total amount of all damages by the total number of occurrences during the 11 year period. Projected loss expresses an estimated damage amount per future occurrence by multiplying the average loss figure times 15%.</p> <ul style="list-style-type: none"> • Zero denotes no data available to determine the average occurrence average loss or projected loss per event. 					
Source: NOAA: Alabama Forestry Commission, U.S. Forest Service, Participating Local Jurisdictions					

City Of Vernon Mitigation Action Plan

The City Of Vernon recognizes the importance of Mitigation Planning and will incorporate Mitigation planning in planning documents as they are revised or initiated.

Mitigation Status

During the plan update mitigation actions were reviewed in Order to identify completed, deferred, or deleted actions from the previous plan and incorporate actions added during annual updates. New actions identified during the update planning process have also been added to the plan. Some actions were identified as serving the purpose of preparedness, response, and recovery to an extent that warranted removal from the plan. The hazard planning committee agreed that such actions did not meet the intent of mitigation planning or the eligibility of mitigation grant programs. In order to track the progress of identified actions, the City of Vernon's original 2005 Mitigation Plan list is shown below. The current status of the proposed actions is shown in *Italics*.

BENCHMARKING:

City Of Vernon Mitigation Plan (2005)

Current Projects

- There are no hazard mitigation projects currently underway

Future Projects

1. Add additional outdoor Warning sirens - Deferred
2. Indoor warning systems for public buildings -Deferred
3. Construct a community storm shelter - Completed and Deferred
4. Encourage individual storm shelters - Deferred
5. Upgrade Drainage System - Deferred
6. Develop and Initiate Response System-Deferred
7. Clean out rights-of-way - Deferred
8. Initiate a Fire Prevention Program to educate residents on fire protection - Deferred
9. Initiate an education program for National Flood Insurance Program - Deferred
10. Upgrade Fire Fighting Equipment - Deferred
11. Become a participant in the NFIP -Revised and Deferred

Table 5-36 shows the City of Vernon's updated mitigation actions. During the plan update process new actions were identified and added to the plan,

Goals remain the same as the last plan.

Goal 1: Protect life

Objective 1.1: Improve Warning and Emergency Communication Systems

Action 1.1: Install additional outdoor warning sirens

Action 1.2: Install indoor warning systems at critical facilities.

Objective 1.2: Reduce impact of hazards on vulnerable populations

Action 1.2: Construct short-term community Storm Shelter

Action 1.2: Encourage Individual Storm Shelters

Objective 1.3: Improve disaster response and recovery

Goal 2: Protect property

Objective 2.1 Reduce losses to critical facilities/assets

Objective 2.2 Continue Participation in NFIP program

Action 2.2: Enforce floodplain management requirements, regulate construction or improvements in Special Flood Hazard Areas (SFHAs).

Objective 2.3 Provide and maintain essential public services

Objective 2.4 Reduce losses due to drainage problems

Action 2.4: Upgrade drainage systems

Goal 3: Reduce economic impacts of disasters

Objective 3.1 Maintain operations of critical businesses and major employers

Goal 4: Protect environment and natural resources

Objective 4.1 Identify, protect, and properly manage floodplains

Objective 4.2 Enforce local codes and regulations related to NFIP

Goal 5: Increase public preparedness for disasters

Objective 5.1 Continue to train severe weather spotters

Table 5-36: City of Vernon Mitigation Actions

Mitigation Action	Upgrade Drainage System, enlarge ditches and culverts, add pipe, storm drains
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	Existing
Local Planning Mechanism	City of Vernon
Time Frame for Completion	one Year from Funding Availability
Estimated Cost	\$ 1,000,000
Funding Sources	Local Grants
Priority	1
Mitigation Action	Construct short-term Community storm shelters 2012
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	City of Vernon, Lamar County EMA
Time Frame for Completion	Two Year from Funding Availability
Estimated Cost	\$ 250,000
Funding Sources	Local Grants
Priority	2 Done and working on additional
Mitigation Action	Encourage Individual Storm Shelters by providing \$ 500 incentive to approved applicants Limit 40 shelters
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Lamar County EMA
Time Frame for Completion	One to Two Year from funding Availability
Estimated Cost	\$ 20,000 Maximum
Funding Sources	Local, Grants
Priority	2
Mitigation Action	Enforce Floodplain Management Requirements: Regulate Construction or improvements in Special Flood Hazard Areas (SFHA's)
Hazard(s) Addressed	Flooding
Applies to New/Existing Asset	New and Existing
Local Planning Mechanism	City of Vernon
Time Frame for Completion	Continuous
Estimated Cost	\$100,000
Funding Sources	Local
Priority	2
Mitigation Action	Install additional outdoor warning sirens
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Lamar County EMA, City of Vernon
Time Frame for Completion	One Year from Funding Availability
Estimated Cost	\$ 15,000 each
Funding Sources	Local Grants
Priority	2
Mitigation Action	Install indoor warning systems at critical facilities
Hazard(s) Addressed	All
Applies to New/Existing Asset	New
Local Planning Mechanism	Lamar County EMA, City of Vernon
Time Frame for Completion	One Year from Funding Availability
Estimated Cost	\$ 10,000 each
Funding Sources	Local Grants
Priority	2

Section Six: Mitigation Plan Maintenance

The plan may be reviewed at any time at the request of any jurisdiction, by the Chairman of the Hazard Mitigation Planning Committee, Or at the discretion of the Lamar County EMA Director. Jurisdictions may submit a formal letter to the Lamar County EMA Director or the Chairman of the Lamar County Hazard Mitigation Planning Committee requesting a review of the plan. The public may also request review of the plan by submitting a formal letter to the Lamar County EMA Director or the Chairman of the Lamar County Hazard Mitigation Planning Committee requesting a review of the plan.

Hazard Mitigation Planning Committee may re-evaluate the plan after a disaster has occurred to make sure that mitigation of the hazard was addressed properly. At the minimum, the Hazard Mitigation Planning Committee will meet on an annual basis to monitor, evaluate, and amend this plan. The meetings will be publicized well in advance so the public can attend. Public participation is encouraged to allow the public an opportunity to participate in the process. The Hazard Mitigation Planning Committee will review a variety of resources and examine conditions, which may affect mitigation activities for natural and technological hazards. The committee will review existing plans, policies, maps, and other documentation such as, but not limited to:

- NFIP flood panels
- Post-disaster redevelopment models
- Critical facilities lists and maps
- Existing land-use maps
- Future land-use maps
- Current zoning maps
- Land development codes
- Governing body codes and resolutions
- Comprehensive plans, including drainage studies
- Emergency Operations Plan
- Standard Operating Guidelines
- Various other plans and/or studies related to hazard mitigation

The EMA Director will serve as the point of contact for all amendments to the plan and will coordinate all additions, deletions or amendments of actions to the plan, as needed. The EMA Director will be responsible for informing the local governing bodies of any amendments made to the plan. Any local government seeking to add an action(s) to the plan will be responsible for providing support for the action in the form of a resolution if, and only if, the funding source(s) requires so. The entire plan will be updated on a five-year planning cycle.

The method and schedule for the five-year update of the plan will be determined by the Lamar County EMA Director. The EMA Director will elect to either contract out the update of the plan or utilize Lamar County staff to perform the update. The plan update will be scheduled well in advance of the plan expiration date in order to allow adequate time for the planning process to be completed.

On the anniversary of the plan's approval by FEMA, a public meeting will be conducted to review and solicit public comment. Documentation will be maintained and submitted to FEMA during the next plan revision.

Incorporation into Existing Planning Mechanisms

The Lamar County Hazard Mitigation Plan has been incorporated as an annex into the current Lamar County Emergency Operations plan administered by the Lamar County Emergency Management Agency. The Lamar County Hazard Mitigation Plan update has also been incorporated into the District II Comprehensive Economic Development Strategy (CEDS). District II covers the West Alabama counties of Bibb, Fayette, Greene, Hale, Lamar, Pickens, and Tuscaloosa.

Incorporation of the hazard mitigation plan will vary for each jurisdiction based on existing planning methods and processes. Jurisdictions with planning commissions and respective zoning ordinances and building codes will incorporate mitigation plan elements as appropriate into their review of new developments.

Many jurisdictions have no zoning or existing plans of any type Other than this mitigation plan (see Table 1-1) and do not have the resources or funding to prepare them. In these cases, where applicable, the mitigation plan elements will be incorporated into local development decisions by the appropriate local coordinating body in order to determine funding, prioritization, and review of new development activities. At such time as the jurisdiction does adopt zoning and building codes they will reflect the goals and objectives set forth in this plan. Further, any jurisdiction preparing or updating a comprehensive plan will reflect their hazard mitigation goals and objectives in their plan. These updates will occur as budget and time allow.

Continued Public Participation

The plan will be available for the public to view at the Lamar County Emergency Operations Center, all City and Town Halls, the Lamar County Courthouse, and the West Alabama Regional Commission.

The Lamar County EMA will hold public meetings annually that coincide with the Mitigation Planning Committee meetings to keep the public involved in the planning process, the notification of meetings will include, but not be limited to, advertisement in a paper of local circulation. Meeting advertisements will include contact information for those wishing to submit comments.

APPENDIX 1

Mitigation Ideas: Possible Mitigation Measures by Hazard Type

From FEMA Mitigation Planning Workshop for Preparing and Reviewing Local Plans Student
Manual

Emergency Management Institute, Course Code: G-318

MITIGATION IDEAS:

Possible Mitigation Measures by Hazard Type A Mitigation Planning Tool for Communities

Hazard mitigation refers to any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazardous conditions. The following list of possible hazard mitigation measures for communities is compiled from experience and discussion within the states of FEMA Region 5: Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin. The list of hazard types and ideas state generally with coverage of natural hazards, such as flood or earthquake. These are followed by types of man-made and technological hazards. As extensive as this list is, it does not preclude other ideas for activities to save lives and prevent or reduce damages in the future. Many of the ideas are developed in other FEMA publications, including www.fema.gov as well as in publications of other federal and state agencies.

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A WORD ABOUT PLANNING

Mitigation planning is best accomplished from a multi-hazard perspective. Reducing the level of risk involving one natural or technological hazard may increase the risk of damage from another hazard. Consequently, it is important to consider that some mitigation alternatives may not be viable given a particular set of hazard conditions. For example, elevating a home on stilts to allow for water flow in a floodplain can be a good thing, but it becomes a problem if the home is in an earthquake zone and the ground starts shaking.

PREPAREDNESS FOR ALL TYPES OF HAZARDS

Some mitigation ideas fit easily into many or all hazard types. These also tend to fall under a type of planning generally referred to as "preparedness." A selection of mitigation/preparedness ideas is included here at the beginning; these ideas can be considered relevant to all sections of the mitigation ideas list.

Public Education and Awareness

State and local governments can provide information describing all types of hazards, methods for preventing damages resulting from hazardous conditions, and how to respond when a hazard threatens. Either directly or by lobbying elected officials, citizens can also get involved in comprehensive planning activities that identify and alleviate their communities' hazards.

Mutual Aid/interagency Agreements

Local governments should establish mutual aid agreements for utility and communications systems, including 9-1-1. Mutual aid or interagency agreements have value for preventing or responding to other hazard or emergency situations, as fire and police departments often do.

9-1-1 and 3-1-1

Some communities have expanded their basic 9-1-1 location identification telephone service to include features such as "enhanced 9-1-1" that registers name, address, and a description of the building/site. It has become more common to use a "reverse 9-1-1" system with which a community can send out a mass telephone announcement to every number in the 9-1-1 system. Additionally, non-emergency 3-1-1 service can be used to have people call to get information, such as locations of cooling shelters during a heat wave.

NOAA Weather Radio

Communities can encourage the use of National Oceanic and Atmospheric Administration (NOAA) weather radios among their residents. At least one set of counties surrounding a chemical stockpile has provided NOAA weather radios to all homes and businesses within the area.

NOAA Weather Radio continuously broadcasts National Weather Service forecasts, warnings and other crucial weather information. NOAA Weather Radio also provides direct warnings to the public for natural, man-made, or technological hazards, and it is the primary trigger for activating our country's Emergency Alert System (EAS) on commercial radio, television, and cable systems.

Emergency Alert System

Using digital technology to distribute messages to radio, television and cable systems, the EAS provides state and local officials with the ability to send out emergency information targeted to a specific area. The information can be sent electronically through broadcast stations and cable systems even if those facilities are unattended.

Continuity of Operations Planning

The goal of Continuity of Operations (COOP) planning is to ensure that the essential functions of an organization, including government, can continue to operate during and after an emergency incident which may prevent access to normally operating systems, such as physical plant, data or communication networks, or transportation. Communities can encourage businesses, other organizations, and families to prepare themselves by regularly backing up computer drives, copying essential files and/or important family information, and storing these

items in a separate location. A larger organization may coordinate with another office from the organization in a different part of the country to take over operations when necessary.

Land Use Planning

Once a community is familiar with the location of its hazardous areas; it may adopt a land use plan, or modify an existing land use plan to:

1. Guide development away from hazardous areas;
2. Reduce density in the hazardous areas; or
3. Encourage greater development restrictions on the property.

Site Emergency Plans

Communities can encourage development and testing of internal emergency plans and procedures, including COOP planning, by businesses and other organizations. Communities should develop and test site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other similar facilities.

Emergency Response Personnel

Emergency response personnel need to be trained and plan for various contingencies and response activities, such as evacuation, traffic control, search and rescue.

Community Emergency Response Teams

A community may consider sponsoring a Community Emergency Response Team (CERT). A CERT is a volunteer group of citizens who are trained and equipped to respond if emergency services are unable to meet all of the immediate needs of the community following a major disaster especially if there is no warning as in an earthquake.

Insurance

Insurance should not be considered an alternative to reducing damages for any type of hazard, but it does have the value of protecting oneself from financial devastation if damage were to occur.

Real Estate Disclosure

Real estate disclosure laws are important because they force a seller to advise a potential buyer about pre-existing conditions. This allows buyers to make more informed decisions about the potential risks involved in owning property, such as whether property is located in a floodplain or if it had been previously damaged from flood water or any other type of hazard condition.

Family Disaster Plans and Supply Kits

Communities can encourage residents to prepare themselves by stocking up with necessary items and planning for how family members should respond if any of a number of possible emergency or disaster events strike.

Flood

Ninety percent of federal disaster declarations are for flood events. Response and recovery costs can be extremely high, so where risks are apparent makes sense to take actions that prevent damage from occurring. If flood damage cannot be fully prevented, there may be mitigation techniques that lessen the damage. Flooding addressed in this section can be from high ground water, overland flooding from rivers or streams, or from a dam failure.

Acquisition

Land with structures may be purchased by and titled in the name of a local governing body that can remove structures and enforce permanent restrictions on development.

Relocation

A structure may be moved to a less hazardous location.

Elevation

A structure may be mechanically lifted so that the lowest floor, including the basement, is raised above the base flood elevation. Utilities or other mechanical devices should also be raised above expected flood levels.

Dry-Flood Proofing

It may be possible to keep water out by strengthening walls, sealing openings, or using waterproof compounds or plastic sheeting on walls. Dry-flood proofing is not recommended for residential construction but may be a reasonable alternative for non-residential structures—either in new construction, while making a substantial improvement, or while repairing a substantially damaged structure.

Wet-Flood Proofing

Using water resistant paints or other materials can allow for easy cleanup after floodwater exposure in accessory structures or in a garage area below an elevated residential structure. In a basement, wet-flood proofing may be preferable to attempting to keep water out completely, because it allows for controlled flooding to balance exterior and interior water forces and discourage structural collapse. Wet-flood proofing may not be used for basements in cases of new construction, substantial improvement, or substantial damage.

Floodplain/Coastal Zone Management

Determining and enforcing acceptable land uses through planning and regulation may not prevent inevitable flooding in flood-prone areas, but planning and regulation can alleviate the risk of damage by limiting exposure in such hazard areas. Floodplain and coastal zone management can be included in comprehensive planning.

Capital Improvement Plan

Infrastructure planning decisions can affect flood hazard mitigation. For example, decisions to extend roads or utilities to an area may increase exposure. Some communities may consider structural flood protection such as levees or floodwalls.

Zoning Ordinance Adoption or Amendments

Examples of zoning methods that affect flood hazard mitigation include:

- 1) Adopting ordinances that limit development in the floodplain.
- 2) Limiting the density of developments in the floodplain.
- 3) Requiring that floodplains be kept as open space.

Subdivision Ordinances or Amendments

Subdivision design standards can require elevation data collection during the platting process- Lots may be required to have buildable space above the base flood elevation.

Building Code Adoption or Amendments

Requirements for building design standards and enforcement include the following possibilities.

- 1) That a residential structure be elevated.
- 2) That a nonresidential structure be elevated or flood proofed.

Conservation Easements

Conservation easements may be used to protect environmentally significant portions of parcels from development. They do not restrict all use of the land. Rather, they direct development to areas of land that are not environmentally significant.

Transfer of Development Rights

In return for keeping floodplain areas in open space a community may agree to allow a developer to increase densities on another parcel that is not at risk. This allows a developer to recoup potential losses from non-use of a floodplain site with gains from development of a non-floodplain site.

Purchase of Easement / Development Rights

Compensating an owner for partial rights, such as easement or development rights, can prevent a property from being developed contrary to a community's plan to maintain open space. This may apply to undeveloped land generally or to farmland in particular.

Storm Water Management Ordinances or Amendments

Storm water ordinances may regulate development in upland areas in order to reduce storm water run-off. Examples of erosion control techniques that may be employed within a watershed area include proper bank stabilization with sloping or grading techniques, planting vegetation on slopes, terracing hillsides, or installing riprap boulders or geotextile fabric.

Multi-Jurisdiction Cooperation within Watershed

Forming a regional watershed council helps bring together resources for comprehensive analysis, planning, decision-making, and cooperation.

Comprehensive Watershed Tax

A tax can be used as a mitigation action in several ways:

- 1) Tax funds may be used to finance maintenance of drainage systems or to construct reservoirs.
- 2) Tax assessments may discourage builders from constructing in a given area.
- 3) Taxes may be used to support a regulatory system.

Post-Disaster Recovery Ordinance

A post-disaster recovery ordinance regulates repair activity, generally depending on property location. It prepares a community to respond to a disaster event in an orderly fashion by requiring citizens to:

- 1) Obtain permits for repairs.
- 2) Refrain from making repairs.
- 3) Make repairs using standard methods.

Flood Insurance

Purchasing flood insurance does not prevent a flood from occurring, but it does mitigate a property owner's financial exposure to loss from flood damage. National Flood Insurance Program (NFIP) policies are only available in communities that participate in the program, which is administered by FEMA.

Floodplain Ordinances or Amendments

Communities that choose to participate in the NFIP must adopt ordinances that meet minimum federal and state requirements. Communities may pass more stringent ordinances to reduce risk even further.

Community Rating System

Also administered by FEMA, the Community Rating System (CRS) is a companion program to the NFIP. It rewards a community for taking actions over and above minimum NFIP requirements with the goal of further reducing flood damages in the community. The more actions a community takes, the lower the premiums for flood insurance within that community.

Updated Floodplain Mapping

By taking the initiative locally to more accurately map problem areas with information not already on FEMA maps, a community can warn residents about potential risks that may not have been anticipated. Upgrading maps provides a truer measure of risks to a community.

Storm Drainage Systems

Flood mitigation can involve installing, re-routing, or increasing the capacity of a storm drainage system that may involve detention and retention ponds, drainage easements, or creeks and streams. It can include separation of storm and sanitary sewerage systems as well as higher engineering standards for drain and sewer capacity.

Drainage System Maintenance

At most times, a drainage system will do its job and move water to intended areas. However, if a system is not maintained, erosion, material dumping, or deterioration of man-made reinforcement materials may reduce the carrying capacity of a stream. Therefore, regular maintenance, such as sediment and debris clearance, is needed so that the stream may carry out its design function. Also important is detection and prevention/discouragement of discharges into storm-water/sewer systems from home footing drains, downspouts or sump pumps.

Drainage Easements

Communities may consider obtaining easements for planned and regulated public use of privately owned land for temporary water retention and drainage.

Wetland Protection

With special soils and hydrology, wetlands serve as natural collection basins for floodwaters. Acting like sponges, wetlands collect water, filter it, and release it slowly into rivers and streams. Protecting and preserving wetlands can go a long way toward preventing flooding in other areas.

Roads

Roads are needed to get people and goods from place to place. In addition to planning for traffic control during floods, there are various construction and placement factors to consider when building roads. To maintain dry access, roads should be elevated above the base flood elevation. However, if a road creates a barrier it can cause water to pond. Where ponding is problematic, drainage and flow may be addressed by making changes to culvert size and placement. In situations where flood waters tend to wash roads out, construction, reconstruction, or repair can include not only attention to drainage but also stabilization or armoring of vulnerable shoulders or embankments.

Structural Flood Control Measures

Structural flood control measures (e.g., levees, dams, or floodwalls) channel water away from people and property. Structural measures may also increase drainage or absorption capacities (e.g., detention and retention basins, relief drains, spillways, drain widening/dredging or rerouting, logjam and debris removal, extra culverts, bridge modification, dike setbacks, flood gates and pumps, or channel redirection). However, structural measures may cause an increase in the base flood elevation. History has shown that structures that channel water may create a false sense of security and result in greater damage to nearby properties if the structures fail.

Minor Structural Projects

A minor structural project is similar but smaller and more localized than a structural project, in that the measures used to reduce flooding may include levees, floodwalls, dams or other activities that channel water away from people or property. However, a minor structural project should only be constructed in areas that cannot be mitigated through nonstructural activities, or where structural activities are not feasible due to low densities.

Dam and Levee Maintenance

Although dams and levees may have been constructed properly, failure to maintain them can lead to significant loss of life and property if they are stressed and broken or breached during a flood event. An inspection, maintenance and enforcement program helps to ensure continued structural integrity. Dams or levees need to be kept in good repair. Unnecessary or old and structurally unsound dams should be removed. Planning for dam breaks can include constructing emergency access roads as well as automating pump and flood gate operation.

And it never hurts to regulate development in a dam's hydraulic shadow, where flooding would occur if there were a severe dam failure.

Community Outreach and Education

Communities may use outreach programs to:

- 1) Advise homeowners of risks to life, health and safety.
- 2) Facilitate technical assistance programs that address measures that citizens can take.
- 3) Facilitate funding for mitigation measures.

Driver safety strategies for flooded areas can be addressed through driver safety/education classes and by the media. Local officials can be trained on flood fighting, floodplain management, flood proofing, and traffic control during flooding, and other measures.

Debris Control

Community members can participate in debris control by securing debris, yard items, or stored objects that may otherwise be swept away, damaged, or pose a hazard if floodwaters would pick them up and carry them away. Additionally, a community can pass and enforce an ordinance that regulates dumping.

Hazardous and Buoyant Material Protection

Containers of hazardous materials such as petroleum or chemicals should not be located in a flood hazard area. If such a location is necessary, hazardous material containers need to be anchored, because the contents can contaminate water and multiply the damaging effects of flooding by causing fires or explosions, or by otherwise making structures unusable. Also, buoyant materials should be anchored, because if they float downstream, they may cause additional damage to buildings or bridges or may plug a stream resulting in higher flood heights.

Manufactured Homes

Manufactured or mobile homes should be elevated above the base flood elevation and anchored, or more preferably, kept out of the floodplain.

Flood Warning

In addition to a communication strategy, a flood warning system may consist of people or machines monitoring water level with stream gauges. Although a flood warning system generally does not provide long-term damage reduction, it can alleviate health and safety risk by providing citizens time to escape and possibly remove belongings that could be damaged. NOAA weather radio and EAS broadcasts can be incorporated into a community's flood warning system.

Back-up Generators

A community may consider back-up generators for pumping and lift stations in sanitary sewer systems, along with other measures (e.g... alarms, meters, remote controls, and switchgear upgrades).

Basement Backflow Prevention

Depending on its infrastructure capabilities, a community may encourage the use of check valves, sump pumps, and backflow prevention devices in homes and buildings.

LANDSLIDE AND DEBRIS FLOW

Landslides or debris flow can be caused by the same high water levels or rain that result in flooding. Landslides can also be caused by earthquakes. Although many mitigation measures resemble those for flooding, landslides pose unique considerations.

Mapping

Local Governments, developers, and residents can make better decisions using maps. Soil types, slope percentage, drainage, or other critical factors are used to identify landslide prone areas.

Building Codes

Building codes can set construction standards, including minimum foundation requirements, in landslide-prone areas.

Slide Prone Area Ordinance

A special purpose ordinance for slide-prone areas may be used to limit fill or dumping, as well as address drainage and other landslide related problems.

Code Enforcement

A strong community commitment to code enforcement is necessary to ensure compliance with building codes and zoning ordinances.

Drainage Control Regulations

Drainage regulations are similar to storm water management regulations. By controlling drainage, a community can reduce the risk of landslides resulting from saturated soils.

Grading Ordinances

Grading ordinances require developers and landowners to obtain permits prior to filling or regarding. Such ordinances may also provide specific design standards.

Hillside Development

Hillside development ordinances are special purpose ordinances that set specific standards for construction on hillsides.

Subdivision Ordinances

Subdivision ordinances set guidelines on how land will be divided, the placement and size of roads, and the location of infrastructure. Such ordinances can also be used to regulate open space and buildable areas.

Sanitary System Codes

Sanitary system codes can reduce the effect of drainage on landslides by limiting the type and location of sanitary systems.

Geological Hazard Overlay Zones

A geological hazard overlay zone requires a detailed geo- technical analysis prior to any construction activity used in association with building codes, this may reduce damage potential by providing clear information about risk.

Open Space Designations

Open space designations keep landslide prone areas undeveloped.

Relocation

Structures may be moved to less hazardous locations.

Acquisition

Land and structures may be purchased by and titled in the name of a local governing body that can remove structures and enforce permanent restrictions on development.

Restraining Structures

Restraining structures may be designed and used to hold soil in place.

Debris-Flow Measures

Debris-flow measures may include stabilization, energy dissipation, and flow control measures, all of which may reduce damage in sloping areas.

Grading

Grading can be used to increase slope Stability, depending on types of soils, height of fill or cut, and compaction.

Vegetation Placement and Management Plans

Various types of vegetation increase soil stability through root length and strength and by absorbing precipitation. Management plans are aimed at ensuring long-term maintenance of vegetation appropriate for an area.

Utility Location

Placing utilities outside of landslide areas decreases the risk of service disruption.

Abatement Districts

A special taxing district, such as an abatement district, can be used to pool resources to mitigate common hazards.

Restrictive Covenants

A legally binding agreement in a private development can be used to impose restrictions on land use.

THUNDERSTORMS / LIGHTNING

Damage from thunderstorms and lightning is often underestimated. Everyone should have an appreciation for the dangers of lightning. Although not entirely preventable, damage and life safety risk from these events can be minimized.

Community Outreach and Education

Communities may use outreach programs to promote awareness of thunderstorm dangers, drivers' safety strategies for severe weather events can be addressed by driver safety/education classes and by the media.

Early Warning Systems

Local and state governments can invest in public early warning systems/networks, as well as train people to serve as weather spotters.

Building Construction

Public and private buildings can be designed with structural bracing, shutters, laminated glass in window panes, and hail resistant roof shingles or flashing to minimize damage.

Surge Protectors and Lightning Protection

Surge protection can be installed on critical electronic Protection equipment. Lightning protection devices and methods, such as lightning rods and grounding, can be installed on a community's communications infrastructure and other critical facilities.

Burying Power Lines

Buried power lines offer the security of uninterrupted power during and after storms. However, consideration needs to be made for maintenance and repair, particularly in cold climates where soil freezes more readily.

Tornado

Tornadoes can strike anywhere and cause extensive damage. Damage and life safety risk may not be entirely preventable, but it can be minimized.

Construction Standards and Techniques

To strengthen public and private structures against severe wind damage, communities can require or encourage wind engineering measures and construction techniques that may include structural bracing, straps and clips, anchor bolts, laminated or impact-resistant glass, reinforced pedestrian and garage doors, window shutters, waterproof adhesive sealing strips, or interlocking roof shingles. Also, architectural design can make roofs less susceptible to uplift.

Safe Rooms

Risk to lives can be improved through construction and use of concrete safe rooms in homes and shelter areas of mobile home parks, fairgrounds, shopping malls, or other vulnerable public areas.

Manufactured Homes

Damage and injury can be prevented by anchoring manufactured homes and exterior attachments such as carports and porches.

Loose Items

Loose items like yard and patio furniture should be secured.

Temporary Debris Disposal

Temporary debris disposal sites can be protected by fencing and/or located away from populated areas.

Severe Winds

Severe wind can be as destructive as tornadoes. Damage and life safety risk may not be entirely preventable, but it can be minimized.

Roofing Shingles

Requiring the use of special roofing shingles designed to interlock and resist uplift forces in extreme wind conditions can reduce damage to a roof or to other structures.

Building Construction

Engineered construction can accommodate foundation design, braced elevated platforms, and the ability of a structure to withstand the lateral forces of winds and waves.

Manufactured Homes Tie-Downs

The risk of manufactured home damage can be reduced by using tie-downs with anchors and ground anchors appropriate for the soil type.

Burying Power Lines

Buried power lines offer the security of uninterrupted power after severe winds, but consideration needs to be made for maintenance and repair.

Designed Failure Mode

Designed-failure mode refers to power line design that allows for lines to fall or fail in small sections rather than as a complete system, so restoration can be done more quickly.

Backup Power

Backup power resources can enable critical facilities to continue basic services and can be used by businesses to ensure security and protect refrigerated goods.

Tree Management

Tree pruning near power lines can reduce the potential for trees falling on and breaking power lines.

EXTREME TEMPERATURE

When temperatures reach levels that are extremely high or extremely low, they pose dangers that can be alleviated by planning for how to handle such situations.

Outreach/Public Awareness

A local government can organize outreach to vulnerable populations during periods of extreme temperature, including establishing and promoting accessible heating or cooling centers in the community.

Heating Requirements

Housing/landlord codes can require minimum temperatures.

Heating Bills

If not already required by state law, communities can encourage utility companies to offer special arrangements for paying heating bills.

Heating and Cooling Centers

A community can establish heating and/or cooling centers for vulnerable populations. Center operations should be linked to outreach projects that encourage at-risk populations to use the centers.

WINTER WEATHER/SNOWSTORMS

Proper preparation can decrease the risks of injury that can occur during cold weather, and snowstorms in particular.

Family and Traveler Emergency Preparedness

A local or state government can produce and distribute family and traveler emergency preparedness information relating to severe winter weather hazards.

Driver Safety

Severe weather events can be included in driver education classes and materials.

Power Lines

Burying or otherwise protecting electric and other utility lines can prevent utility disruption by protecting lines from ice, wind or snow damage. Nevertheless, lines buried in frozen soil may be difficult to reach if repair is necessary.

Code Enforcement and Building

Local governments can impact building/site design through maintenance building code enforcement of snow-related ordinances such as snow loads, roof slope, snow removal, and storage. Communities can also monitor snow amounts to provide site specific snow load data.

Home and public building maintenance should be encouraged in order to prevent roof and wall damage from "ice dams", particularly resulting from ice and sleet storms.

Shelters

A community can establish heating centers or shelters for vulnerable populations, not only for residents, but also for stranded motorists/travelers.

Outreach

A community can plan to systematically contact isolated, vulnerable, or special-needs populations.

Animal Protection

Farmers and other animal custodians should plan for addressing livestock or other animal needs.

Roads

Local governments need to always plan for and maintain adequate road and debris clearing capabilities.

Snow Fences

Using snow fences or "living snow fences" (rows of trees or other vegetation) can limit blowing and drifting of snow over critical roadway Segments.

SNOW LOAD

Buildings can only hold so much snow before they collapse. Paying attention to snow load weight capacities can prevent damage and injury.

Snow Load Design Standards

A single snow load weight capacity standard may not be adequate for all areas within a community. Local building departments should determine the snow load limits for their communities based on local data. A community's building code can include snow limits or weight capacity standard in an appendix.

Snow Weight Data Collection

Establishing a program of systematic snow weight data collection will enable a community's building department to better establish realistic snow load design standards.

Maintenance

Building owners should be educated and encouraged to inspect older buildings for deterioration and make subsequent repairs.

Modifications

As buildings are modified, new technology may be used to create or increase structural stability.

Analysis and Repair or Replacement of Structural Systems

Existing support systems may be vulnerable to load stress. A community may wish to set up an inspection system and recommend repairs to building owners.

SUBSIDENCE

Some areas of land are susceptible to collapse. Risks of collapse can be determined and managed.

Community Awareness

Local and state governments can promote community awareness of subsidence risks and effects.

Mapping

Old mining areas or geologically unstable terrain should be identified and mapped so that development can be prevented or limited.

Open Space

Areas susceptible to collapse can be maintained as public open space.

Acquisition

Land or structures may be purchased by and titled in the name of a local governing body that can enforce permanent restrictions on development.

Filling or Buttressing

Filling or buttressing subterranean open spaces, as with abandoned mines, can prevent or alleviate collapse.

Hydrological Monitoring

Groundwater levels can be monitored in subsidence-prone areas.

EARTHQUAKE

Some regions are particularly susceptible to earthquake damage. Risks of injury and damage from earthquake events can be determined and managed.

Seismic Hazard Mapping

Information gained from seismic hazard mapping can be used to assess risk. The first step is collection of geological information on seismic sources, soil conditions, and related potential hazards. The second step is to prepare a map showing the approximate locations of various hazards.

Related Hazard Mapping

Other earthquake related hazards include liquefaction and landslides. Maps of these related hazards may be used for vulnerability analysis and risk assessment.

Map Education

Map users should be educated in the appropriate uses and limitations of maps.

Rapid Visual Screening

Rapid visual screening is a technique used to quickly inspect a building and identify disaster damage or potential seismic structural and non-structural weaknesses. This method may be used to screen and prioritize retrofitting efforts, or inventory high-risk structures and critical facilities. In a post-disaster setting, rapid visual screening can be used to assess risk during response and recovery efforts and determine if buildings are safe to re-occupy.

Loss Estimation Studies

After seismic hazards have been identified, planners can create an earthquake scenario to estimate potential loss of life and injuries, the types of potential damage, and existing vulnerabilities within a community. Scenarios can be particularly useful in predicting lifeline performance, i.e., the sustainability of critical public services or systems such as electricity, water, or roadways. This knowledge can be used to develop earthquake mitigation priorities.

HAZUS

FEMA's HAZUS is a computer-based tool that can be used to quantitatively estimate losses from an earthquake.

Seismic Safety Committees

Duties of a local or state seismic safety committee can include providing policy recommendations, evaluating and recommending changes in state and local seismic safety standards, and an annual assessment of local and statewide implementation of seismic safety improvements.

School Survey Procedures

Schools are critical facilities not only because of the special population they accommodate, but they are often identified as shelter sites for a community. Due to this sheltering role, it is essential that these buildings function after a seismic event. A community can develop a survey procedure and guidance document to inventory structural and non-structural hazards in and near school buildings. Survey results can be used to determine mitigation priorities that can be incorporated into capital improvement plans.

Capital Improvement Planning

School Districts, local governments, corporations, and others have developed capital improvement plans to ensure that facilities remain operational for years down the road. It is more efficient and cost effective to incorporate structural and non-structural seismic strengthening actions into on-going building plans and activities, rather than to rehab later.

Guidelines and Model Ordinances

Earthquake hazards can be mitigated through land use planning. Communities can develop and distribute guidelines or pass ordinances that require developers/building owners to locate lifelines, buildings, critical facilities, and hazardous materials out of areas subject to significant seismic hazards. Particular consideration should be given to enforcing such ordinances in areas with steep slopes or subject to ground displacement, severe ground shaking, or liquefaction.

Building Codes

Although land use management that avoids building on hazardous sites is an effective way to reduce earthquake risk, there may be times when it is necessary to build on such sites. Engineers and architects have designed buildings in ways that reduce the impact of ground shaking.

Encouraging all local governments to adopt and enforce updated building code provisions is one effective way to reduce earthquake damage risks.

Seismic Code Training

Legislators often enact seismic building provisions that do not get enforced because architects, engineers, and building departments are unaware of the provisions. Conducting information sessions or other forms of outreach on seismic code provisions for new and existing buildings can enhance code use and enforcement by local architects, engineers, contractors and code enforcement personnel.

Buildings as Structural Hazards

Homeowners and businesses can take simple measures to strengthen their buildings before the next earthquake. Bracing walls and bolting sill plates to the foundation are examples. Non-reinforced masonry buildings and non-ductile concrete facilities are particularly vulnerable to ground shaking. These buildings should be strengthened and retrofitted against future seismic events.

Non-Structural Hazards

Many injuries in earthquakes are caused by nonstructural hazards, such as attachments to buildings. These include lighting fixtures, windows (glass), pictures, tall bookcases, computers, ornamental decorations on the outside of the buildings (like parapets), gas lines, etc. Activities that can reduce the risk of injury and damage include: anchoring tall bookcases and file cabinets, installing latches on drawers and cabinet doors, restraining desktop computers and appliances, using flexible connections on gas and water lines, mounting framed pictures and mirrors securely, and anchoring and bracing propane tanks and gas cylinders.

Technical Assistance for Homeowners

Developing a technical assistance information program for homeowners and teaching them how to seismically strengthen their houses can be an effective mitigation activity. The program could include providing local government building departments with copies of existing strengthening and repair information for distribution to homeowners. Other potential distribution sources include insurance companies, realtors and libraries.

Infrastructure Hardening

Identification and hardening of critical lifeline systems, i.e., critical public services such as utilities and roads, to meet "Seismic Design Guidelines and Standards for Lifelines," or equivalent standards, may distinguish a manageable earthquake from a social and economic catastrophe.

Bridge Strengthening

State and local highway departments should review construction plans for all bridges to determine their susceptibility to collapse, problem bridges should be retrofitted.

Hazard mitigation Awareness

Local or state governments can use community outreach activities to foster an awareness of earthquake mitigation activities in homes, schools and businesses.

Financial Incentives

Local or state government can support financial incentives like low interest loans or tax breaks for home and business owners who seismically retrofit their structures.

Insurance

Local or state governments can work with insurance industry representatives to increase public awareness of the importance of earthquake insurance. Home structural improvements can be factored into the process of obtaining insurance coverage or reduced deductibles.

Reference Library

A local or state government can establish a library consisting of technical documents on structural and nonstructural mitigation options, as well as model ordinances and procedures that have been used by other jurisdictions to reduce earthquake risk.

DROUGHT

Periods of time with little or no precipitation can pose risks that can be managed with conservation and preparation.

Water Saving

Citizens can be encouraged to take water-saving measures, especially when extra water is needed for irrigation and farming. Possibilities include installing low-flow water saving showerheads and toilets, and turning water flow off while brushing teeth or during other cleaning activities.

Water Storage

Human consumption is the primary reason to maintain a storage of water. People cannot live without consuming water regularly.

Water Use Ordinances

Communities can pass ordinances to prioritize or control water use, particularly for emergency situations like firefighting.

Contingency Plans

Drought contingency plans can help anticipate needs and actions to take during a drought.

Water Delivery Systems

Designs or plans for water delivery systems can include consideration of drought events.

Crop Insurance

Crop insurance can preserve economic stability for farmers during a drought.

WILDFIRE

Wildfires typically start in woodland or prairie areas. They can occur naturally though they are often exacerbated by human activities. Wildfires can be hard to control as they threaten homes and communities located nearby. Although preventing or controlling wildfires is preferable, there are many mitigation efforts we can take to prevent or alleviate damage to our homes and communities when fires inevitably occur.

Public Education

Outreach efforts can promote such items as non-combustible roof covering, fire safe construction, and the importance of clearing brush and grass away from buildings. It is important to promote public education on smoking hazards and the risks of recreational fires.

Neighborhood Groups

Citizens may organize neighborhood wildfire safety coalitions to plan how their neighborhoods can work together to prevent a wildfire.

Zoning

Zoning can be used to cluster development into defensible areas and keep development away from fire hazards such as steep slopes, where fires are difficult to contain.

Defensible Space

Damage potential can be reduced by ensuring that structures are surrounded by defensible space or buffer zones. Buffer zones are manageable areas, generally 30 to 100 feet and cleared of combustible materials.

GIS Mapping

GIS mapping of vegetative coverage can facilitate analysis and planning decisions through comparison with topography, zoning, developments, infrastructure, or other markers.

Power Line Maintenance

Local power companies can help prevent or alleviate wildfires by proper maintenance and separation of power lines, as well as efficient response to fallen power lines.

Insurance Company Promotions

Insurance companies can include wildfire safety information in materials provided to area residents.

Property Maintenance

Maintenance of property in or near wildfire prone areas can go a long way toward preventing or reducing the spread of fire. Maintenance includes fuel management techniques such as pruning and clearing dead vegetation, selective logging, keeping grass short, planting fire-resistant vegetation, and creating fuel/fire breaks, i.e., areas where the spread of wildfires will be slowed or stopped by the removal of fuels. Other helpful techniques include use of fire resistant roofing and building materials; use of functional shutters on windows; keeping flammables such as curtains secured away from windows, or using heavy fire-resistant drapes; taking advantage of the fire department's home safety inspections; sweeping/cleaning dead or dry leaves, needles, twigs, and combustibles from roofs, decks, eaves, porches and yards; keeping woodpiles and other combustibles away from structures; use of boxed or enclosed eaves on a house; thorough clean-up of spilled flammable fluids; and keeping garage areas protected from blowing embers, whether from a chimney or outdoor fire place.

Fireplace and Chimney

Residents should be encouraged to inspect chimneys at least a year and clean them at least once a year. Safe fireplace/chimney use and maintenance includes spark arrestors and emphasis on proper storage of flammable items.

Building Codes

Building codes can be used to require upgrades to existing as well as new structures.

Waste Disposal

Wildfire risk can be reduced by safe disposal of yard and household waste rather than through open burning.

Arson Prevention

Wildfires can be prevented by arson prevention cleanup activities in areas of abandoned or collapsed structures, accumulated junk or debris, and in areas with a history of storing flammable materials where spills or dumping may have occurred.

Burning Restrictions

Local ordinances can require burn permits and restrict campfires and outdoor burning.

Road and Driveway Clearance

Roads and driveways should be kept accessible to emergency vehicles and fire equipment. Driveways should be relatively straight and flat, with at least some open spaces to turn. Bridges should be strong enough to support emergency vehicles, with clearance wide and high enough for two-way traffic and emergency vehicle access.

Addresses should be visible from the road, and keys to gates around property should be provided to the local fire departments.

Hillside Construction

It is important to note that hillsides facing south or west are more vulnerable to increased dryness and heat from sun exposure. Structures should be set back from slopes outside of the "convection cone" of intense heat that is projected up the slope of a hill as a wildfire "climbs" it.

Building Foundations

In wildfire prone areas, risk may be decreased by enclosing the foundations of homes and other buildings, rather than leaving them open where undersides can be exposed to blown embers or other materials.

Motorized Equipment

Proper maintenance and storage of motorized equipment can decrease wildfire risk.

Flammable Materials

Wildfire risk can be alleviated by safely using and storing necessary flammable materials, including machine fuels. Approved safety cans should be used for storing gasoline, oily rags and other flammable materials. Firewood should be stacked at least 100 feet away and uphill from homes.

Smoke / Fire Detectors and Sprinklers

Citizens can install and maintain smoke detectors and fire extinguishers on each floor of their homes or other buildings. This equipment should be tested and/or inspected regularly, and smoke detector batteries should be changed twice a year. Everyone in a household or building can be taught how to use a fire extinguisher. Other valuable fire mitigation systems include interior and exterior sprinkler systems.

Spotters

Early detection of wildfires, while fires are smaller, can help make firefighting more successful. Detection can be accomplished by fire spotters who work from either towers or planes.

Media

Media can broadcast information about fire watches and fire warnings.

Response Personnel

Response personnel should have regular training and exercise experience.

Water Supplies

Water supplies for emergency firefighting should be maintained in accordance with National Fire Protection Association (NFPA) standards. Residents should identify and maintain any number of outside water sources such as small ponds, cisterns, wells, swimming pools or hydrants. It is a good idea to have a garden hose that is long enough to reach any area of a home or other structures on a property. Freeze-proof exterior water outlets are recommended for at least two sides of a home or other structures. Additional outlets can be installed at least 50 feet from a home. It may be a good idea to obtain a portable gasoline powered pump in case electrical power is cut off.

Evacuation

Residents should be instructed on proper evacuation procedures, such as wearing protective clothing (e.g., sturdy shoes, cotton or woolen clothing, long pants, a long-sleeved shirt, gloves and a handkerchief to protect the face); taking a Disaster Supplies Kit; and choosing a route away from fire hazards.

Individual Response

Fire emergency telephone numbers should be posted at every telephone. Residents should plan several escape routes away from their homes, by car and foot.

It is a good idea to keep a set of hand tools that can be used as fire tools, such as a rake, axe, hand/chainsaw, bucket and shovel.

When wildfire threatens, residents should be instructed to carry and listen to battery-operated radios for reports and evacuation information, and follow instructions from local officials. Cars should be backed into garages or parked in open space facing the direction of escape, with doors and windows closed and the key in the ignition. Garage windows and doors should be closed but left unlocked. If residents have time, they can take steps to protect their homes by closing windows, vent doors, venetian blinds and heavy drapes; removing lightweight curtains; shutting off natural gas at the meter; turning off pilot lights; closing fireplace screens; and moving flammable furniture into the center of the home away from windows and sliding-glass doors. Outside, residents can seal attic and ground vents with precut plywood or commercial seals; turn off propane tanks; place combustible patio furniture inside; connect garden hose to outside taps; set up a portable gasoline-powered pump; place lawn sprinklers on the roof and near aboveground fuel tanks; wet the roof, wet or remove shrubs within 15 feet of the home; and gather fire tools.

STRUCTURE FIRES

The risk of structure fires varies by location and demographics. Studies commissioned by the U.S. Fire Administration find that certain populations are more at risk of death or injury from structure fires. These groups include people who are economically disadvantaged, very young or very old.

Codes and Enforcement

Building codes and enforcement are the first measure for preventing structure fires.

Building Design

Building designs can include firewalls and fire doors, as well as alarm and sprinkler systems, especially in tall buildings, dormitories, and attached structures.

Public Education and School Programs

Communities can encourage public education and school programs, especially regarding stoves, heaters, fireworks, matches/lighters, smoke detectors, and evacuation. Public education can particularly focus on safe handling and disposal of cigarettes, cigars, pipes, and matches, as careless smoking and children playing with matches and lighters are significant hazards in some neighborhoods. Alcohol and other drug use can exacerbate the risks.

Personal Preparation

Citizens can install and maintain fire extinguishers and smoke detectors. Everyone in a household or workplace can be taught how to use a fire extinguisher. Residential standards established by the National Fire Protection Association (NFPA) require a smoke detector in each bedroom, or adjacent to all sleeping areas. All equipment should be tested and/or inspected regularly, and smoke detector batteries should be changed twice a year. Installing a sprinkler system is another valuable mitigation measure. Also, fire emergency telephone numbers should be posted at every telephone, and residents or building occupants should plan escape routes and assembly points away from their homes or workplaces.

Heating Systems

Fire risk can be controlled through proper installation and maintenance of heating systems.

Space Heaters

If electric space heaters are necessary, they should be placed at least 3 feet from objects, particularly combustible objects. Kerosene heaters pose additional risks relating to flammable liquids and carbon monoxide.

Fireplace and Chimney Maintenance

Residents should be encouraged to inspect chimneys at least twice a year and clean them at least once a year. Safe fireplace/chimney use and maintenance includes installation of spark arrestors and emphasis on proper storage of flammable items.

Electrical Outlets

Fire risk can be controlled through safe installation, maintenance and use of electrical wiring, outlets and fault interrupters.

Arson Prevention

Structure fires can be prevented by cleanup activities in areas of abandoned or collapsed structures, accumulated junk or debris, and in areas that have a history of storing flammable materials where spills or dumping may have occurred. Older communities in particular should consider establishing a quick process to secure and/or demolish abandoned structures.

Flammable Materials

Fire risk can be controlled by using proper procedures, from training and exercising to safe handling of explosive and flammable materials.

Power Line Maintenance

Local power companies can help prevent or alleviate fires by proper maintenance and separation of power lines, as well as efficient response to fallen power lines.

Fire Departments

Fire departments should be deployed, equipped and trained per NFPA standards and ISO recommendations.

Transportation Planning

Transportation planning is important for assessing roads, overpasses, etc., in order to maximize access and improve emergency response times to all inhabited or developed areas of a community. Subdivisions should include more than one entrance to allow access if one of the entrances becomes blocked.

Civil Disturbance

It is important to gain control of civil disturbances and criminal activities that could lead to arson.

Fireworks

It is important to enforce fireworks regulations.

Illegal Drug Laboratories

Fire risk can be improved by elimination of clandestine methamphetamine, or other illegal drug, laboratories through law enforcement and public education.

Scrap Tire Fires

Burning tires emit toxins into the surrounding air. Scrap tire fires not only are difficult and dangerous for fire fighters, they also pose health hazards for the surrounding community.

Tire Disposal Policies

A sample of policies for regulating safe disposal and management of scrap tires includes the following: separation of stored scrap tires from other materials; limits on the size of each pile; minimum distances between piles and property lines; covering, chemically treating, or shredding tires to limit mosquito breeding; providing for fire vehicle access to scrap tire piles; training employees in emergency response operations; installation of earthen berms around storage areas; prevention of pools of standing water in the area; control of nearby vegetation; an emergency plan posted on the property; and storing only the permitted volume of tires authorized for a particular site.

Facility Siting

Land use planning should recognize that scrap tire storage and processing facilities can pose a real environmental and health threat to a community.

Law Enforcement

Law enforcement agencies can be alerted to watch for illegal tire dumping.

Alternate Use/Recycling

Promoting technologies that recycle tires can be an asset. Examples include using whole tires in roadbeds, for culvert wing walls, or as slope protection, or using shredded tires for a playground surface.

Pest Control

Pest-control measures for mosquitoes and other nuisances around scrap tire yards will not prevent fires, but controlling pests can decrease the risk of disease to people in the vicinity.

HAZARDOUS MATERIALS

Various government agencies regulate the use, storage, release, and disposal of hazardous substances, because exposure to these substances can result in imminent injury, illness, or damage to property. Mitigation begins with regulatory compliance.

Safety Procedures and Policies

Regulations require training in and compliance with all safety procedures and systems related to the manufacture, storage, transport, use, and disposal of hazardous materials.

Public Awareness and Worker Education

The Emergency Planning and Community Right-to-Know Act (EPCRA), also known as SARA Title III, provides an infrastructure at the state and local levels to plan for chemical emergencies. Facilities that store, use, or release certain chemicals may be subject to reporting requirements. Reported information is publicly available so that interested parties may become informed about potentially dangerous chemicals in their community. Employers must also communicate the hazards of workplace chemicals and ensure that workers receive education and training.

Local Emergency Planning Committee

To address the possibility of hazardous material incidents, communities are required under Federal law (SARA Title III) to maintain an active and viable Local Emergency planning Committee (LEPC) to develop an emergency plan for preparing for and responding to chemical emergencies, such as spills, leaks, explosions, or other releases. The LEPC is required to review, test, and update the plan each year.

Emergency Plans

The community's emergency plan must include the following: identification of local facilities and transportation routes where hazardous materials are present; procedures for immediate response in case of an accident, including a community-wide evacuation plan; a plan for notifying the public that an incident has occurred; names of response coordinators at local facilities; and a plan for conducting simulation exercises that test the plan.

Risk Management Plans

U.S. Environmental Protection Agency (EPA) regulations require development of Risk Management Plans for sites that manufacture, store, or handle hazardous materials. The details of Chemical Accident prevention and Risk Management programs are managed by EPA's Chemical Emergency preparedness and Prevention Office (CEPPO).

Transportation

The U.S. Department of Transportation (USDOT) administers a labeling and placarding system for identifying the types of hazardous materials that are transported along the nation's highways, railways, and waterways. This system enables local emergency officials to identify the nature and potential health threat of chemicals being transported. If an accident were to occur, local emergency Officials would be able to determine the proper emergency response procedures for the situation. Local law enforcement and other emergency officials should be

well-versed in compliance with and enforcement of USDOT and state regulations regarding hazardous material and hazardous waste transportation.

Disposal

The U.S. EPA's Office of Solid Waste regulates disposal of hazardous waste, as required by the Federal Resource Conservation and Recovery Act (RCRA). RCRA's goals are to:

- 1) Protect us from the hazards of waste disposal.
- 2) Conserve energy and natural resources by recycling and recovery.
- 3) Reduce or eliminate waste.
- 4) Clean up waste that may have spilled, leaked, or been disposed of improperly.

Emergency Response Teams

Regulations require trained, equipped, and prepared emergency response teams, for hazardous material sites and for the community in general.

Search and Rescue

Search and rescue teams need to be trained, equipped, and prepared to work among hazardous materials.

Industrial Site Buffering

Hazardous material exposure can be prevented or reduced by separation and buffering between industrial areas and other land uses. Industrial areas should be located away from schools, nursing homes, hospitals, and other facilities with large or vulnerable populations.

Radioactivity and Radon

Radioactive soils and high-radon areas can pose risks that should not be ignored. Mitigation actions may include avoiding development, removing soils, and capping openings in basements.

Cleanup of Brownfield's

A Brownfield site is real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleanup activities are expensive, but they are recommended for preventing exposure to harmful substances. Grants, low interest loans, or tax relief may be available to assist in the cost of mitigating these sites. Cleaned sites may then be redeveloped and added back to a community's tax rolls.

Security

Security considerations should include preparedness for terrorism, sabotage, or civil disturbance.

TRANSPORTATION ACCIDENTS

Ground, air, and water transportation issues can pose risks to transportation users and to the general public.

Driver Education

The risk of transportation accidents can be reduced through improvements in driver education, traffic law enforcement, and transportation planning that balances needs of public transportation conveyers with safety of the general public. Commercial operators also need training and skill enhancement programs.

Road Design

Improved design, routing, and traffic control at problem roadway areas can reduce risk of transportation accidents. Designated truck routes, as well as enforcement of weight and truck travel restrictions, can help. In long-term planning, communities can consider establishing more connector roads to reduce congestion on arterial roads.

Railroads

Accidents can be reduced through railroad inspections and improved designs at problem railway/roadway intersections.

Airports

Airport maintenance, security, and safety programs are essential for reducing accident risk.

Marine Safety

Accident risk can be reduced through programs that address marine safety and general boater awareness.

Mass Casualty preparation

It is important to consider training, planning, and preparedness for mass-casualty incidents involving all modes of transportation.

Traffic Control

Road closures and traffic control in accident areas becomes especially critical during a hazardous material incident response.

UTILITY FAILURE

Public utilities are critical infrastructure for any community. The potential for failure needs to be reviewed, and inadequacies need to be addressed.

Water and Sewer

Consideration is needed for proper location, design, and maintenance of water and sewer systems, including insulation of critical components to prevent damage from ground freeze. Sewer and storm water systems should be separated or expanded to handle anticipated storm water volumes.

Electrical Lines

A community may consider burying electric and telephone lines, where possible, to resist damage from severe winds, lightning, ice, and other hazards.

System Redundancies

One place where redundancies are recommended is in utility and communications systems, especially lifeline systems, e.g., essential public utilities. The intention is that if one system fails, the other shadow system can take over.

Backup Power

Generators can be used for backup power at critical facilities.

Maintenance

Regular maintenance and equipment checks are important, along with replacement or renovation of aging structures and equipment, which should be made as hazard-resistant as economically possible.

Rolling Blackouts and Brownouts

Sometimes it is a good idea to implement "rolling blackouts" in electrical systems that will otherwise fail completely due to overloading.

Lightning Protection

Electrical and communications systems should be protected from lightning strikes.

Tree Trimming

Tree trimming and maintenance is important for preventing limb breakage and for safeguarding nearby utility lines. A model measure would be to establish a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public right-of-ways.

Digging Hotlines

Most, if not all, states have a utility damage prevention hotline that people can call before digging.

Vulnerably Populations

Communities can develop programs/networks for contacting and assisting elderly or homebound persons during periods of infrastructure failure.

OIL AND NATURAL GAS WELLS• PETROLEUM AND NATURAL GAS PIPELINES

Regions with oil and natural gas wells and/or petroleum and natural gas pipelines need to consider the risks of release.

Safety Regulations

The first step in oil and natural gas well accident prevention is community and operator compliance with industry safety regulations and standards.

Contingency Plans

Companies and surrounding communities need to address contingency planning for worker and public protection, including rescue and evacuation procedures.

Well Segregation

Accidents can be prevented by using buffer strips of land to segregate wells, storage tanks, and other production facilities from transportation routes and adjacent land uses, in accordance with state regulations, and consistent with the level of risk.

Pipeline Location and Design

Pipelines should be well-marked and located away from dense development, critical facilities, special needs populations, and environmentally vulnerable areas whenever possible. Proper pipeline design, construction, maintenance and inspection are essential, especially in high hazard seismic zones.

Digging Hotlines

Most, if not all, states have a utility damage prevention hotline that people can call before digging.

RADIOLOGICAL EMERGENCIES

People receive radiation exposure each day from the sun, radioactive elements in soil and rocks, household appliances like television sets and microwave ovens, and medical and dental x-rays. These exposures may prompt controversy, but they do not pose the risk of imminent danger from radiation release that might occur if a nuclear power plant had a meltdown. Serious radiological accidents can occur anywhere radioactive materials are used, stored, or transported. A nuclear power plant, hospital, university, research laboratory, industrial plant, major highway, railroad line, or shipping yard could be the site of a radiological emergency.

Users of Radiological Materials

Users, transporters, and disposers of radiological materials are required to follow strict procedures that prevent or minimize radiation release.

Emergency Planning for Transportation Routes

Communities located along major transportation routes should develop and practice an emergency plan for handling transportation accidents involving radiological materials.

Radiological Emergency Preparedness for Nuclear Plants

Radiological Emergency Preparedness (REP) for communities surrounding nuclear power plants requires proper awareness of, training on, and implementation of radiological emergency procedures. Specific planning requirements for communities within primary and secondary Emergency Planning Zones are found in the Code of Federal Regulations (44 CFR §350, 351, 352) and in a Nuclear Regulatory Commission guidance document (NUREG-0654).

Three Ways to Minimize Exposure

A community can promote the following three ways to minimize radiation exposure:

- 1) Distance.
- 2) Shielding.
- 3) Time.

The more distance between a person and the source of the radiation, the less radiation received. Like distance, the heavier, dense materials between a person and the source of the radiation, the better. Finally, most radioactivity loses its strength fairly quickly. Limiting the time spent near the source of radiation reduces the amount of radiation received.

Shelters and Warning Systems

Communities can promote awareness of designated fallout shelters and accident warning systems. They also may develop and promote workable population protection plans, i.e., evacuation and in-place sheltering plans.

Safe Rooms

Concrete safe rooms or shelters can be constructed in houses, trailer parks, community facilities, and business districts.

Building Materials

Public buildings and critical facilities can be constructed using laminated glass, metal shutters, structural bracing, and other hazard-resistant, durable construction techniques.

SABOTAGE / TERRORISM / WEAPONS OF MASS DESTRUCTION

Sabotage, terrorism, and the potential for exposure to weapons of mass destruction (WMD) have become part of our social conscious and should be considered in mitigation planning.

Assessment

Local governments can start with development of a thorough community risk and threat assessment that identifies potential vulnerabilities and targets for a sabotage/ terrorism/WMD attack.

Critical Infrastructure Protection

Critical Infrastructure protection (CIP) is extremely important. The federal government has begun a systematic effort to define, prioritize, and develop effective strategies for protecting the Nation's critical infrastructure. Local governments are an integral part of the effort with regard to critical local services, such as water, electricity, telephones, roads and bridges. CIP should be a prominent part of community risk and threat assessment.

Computers

Every person and institution with computers that interface with other computers should consistently use computer data back-up systems and anti-virus software.

Building Materials

Public buildings and critical facilities can be constructed or retrofitted using laminated glass, metal shutters, structural bracing, and other hazard-resistant, durable construction techniques.

Monitoring and Reporting

Prevention can be addressed through alertness, awareness, and monitoring of organizations and activities that may threaten a community. A community can establish a system for reporting information that can be used to prevent terrorist incidents or sabotage. One model may be the U.S. Department of Justice's Operation TIPS, the Terrorism Information and Prevention System, piloted in select cities beginning in August 2002.

Emergency Responder Preparedness

Communities can establish programs for law enforcement/emergency responder training, planning, and preparedness for terrorism/sabotage/WMD attacks.

School Violence

School Safety and violence prevention programs are valuable, particularly since school violence is unfortunately becoming more common.

Public Gatherings

Communities may consider heightening security at public gatherings, Special events, and critical community facilities and industries.

Mental Health Services

Communities can develop a greater awareness of, and provision for, mental health services in schools, workplaces, and other institutional settings.

Private Emergency Plans

Communities can encourage private sector development and testing of internal emergency plans and procedures, including Continuity of Operations (COOP) planning.

CIVIL DISTURBANCE

The potential for civil disturbance and resulting problems should be addressed in mitigation planning. Civil disturbances can include prison or institutional rebellions, disruptive political gatherings, violent labor disputes, urban protests or riots, or problems at large-scale events.

Law Enforcement

Local and state governments can provide law enforcement agencies with training, staffing, and resources.

Planning and Documentation

Local governments or other organizations can anticipate and plan for incidents. When a civil disturbance occurs, it may be an idea to record the event on videotape for later study and use in prosecutions.

Facility Design

Emergency and security provisions can be included in design requirements for schools, factories, Office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other similar facilities.

Environmental Design

Crime Prevention through Environmental Design (CPTED) is a field of planning that examines design, management, integration, and lowered density of poor or blighted areas with the goal of reducing vandalism, crime, and some types of riot events.

PUBLIC HEALTH EMERGENCIES

If left unchecked, various diseases or environmental conditions can result in widespread illness and threats to life.

Immunization

Immunization against communicable diseases can be encouraged among residents of a community.

Ventilation

The spread of communicable diseases can be thwarted by compartmentalizing ventilation systems in areas/facilities prone to crowding, or areas that may involve exposure to contagions or noxious atmospheres.

Radon

Communities can increase public awareness of radon dangers and the prevention efforts that can be taken to reduce concentrations of radon in homes and buildings.

Water and Sewer

Communities need to maintain water and sewer infrastructure at acceptable operating standards. Back-up generators for water and wastewater treatment facilities can help maintain acceptable operating levels during power failures. Separation of storm and sanitary sewer systems can also prevent release of untreated sanitary waste when storm water might otherwise overflow a sewer system.

Vacant Structures

Demolition and clearance of vacant condemned structures can prevent rodent infestations.

Public Health Systems and Public Awareness

Communities can maintain public health systems with sufficient disease monitoring and surveillance capabilities to protect the population from large-scale outbreaks; they can also support free or reduced-cost clinics and school health services. Public awareness campaigns can emphasize the cause, symptoms, and protective actions for disease outbreaks or other potential health emergencies.

Contamination Containment

Public contact with contaminated sites or waters, including floodwaters, should be prevented as much as possible.

Waste Disposal

Communities need to address pollution control, enforcement, and cleanup. Particular procedures need to be followed for disposing of chemicals, including hazardous waste and scrap materials.

Septic Tanks

Septic tanks need to be properly located, installed, cleaned, monitored, and maintained.